A Mixed-Methods Exploration of Atypical Eating Behaviours in Obsessive-Compulsive Disorder

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Submitted to the University of Hertfordshire in partial fulfilment of the requirements of the degree of Doctor of Philosophy

4th July 2025

Acknowledgements

After writing over 60,000 words and working tirelessly to complete this final thesis, I thought that writing my acknowledgements would be the easiest part. However, I quickly realised that finding the right words to express my gratitude to everyone who has played an integral role in this journey was much more difficult than I expected. It seems impossible to summarise the support I've received over the last few years into a few paragraphs. I'm by no means a poet with words – nor the best at keeping to the point – but I would like to take this opportunity to thank those who have been an important part of this journey.

Firstly, I would like to express my deepest gratitude to my supervisory team. I am incredibly fortunate to have had Dr Amanda Ludlow as my principal supervisor, and I thank her for her guidance and support during my time at the University of Hertfordshire – not just for my PhD, but throughout my academic journey. This experience would not have been possible without her. I extend my thanks to Dr Roberto Gutierrez, whose ability to explain complex concepts with both clarity and humour has helped to shape me as a researcher. My sincere thanks to Professor Naomi Fineberg, whose clinical insight and research expertise never ceases to amaze me. Finally, I thank Professor Tim Gale for being not only a wonderful manager, but a truly supportive mentor throughout this important stage of my personal, professional and academic development.

Undoubtedly, this PhD would not have been possible without the contributions of all the participants who gave their time to the studies. Their input has been truly invaluable, and I hope that I can honour their lived experiences through this work. I extend my sincere thanks to Ana Maria Frota Lisbôa Pereira De Souza of OCD Science, The Orchard OCD Registry, OCD Action and the International College of Obsessive-Compulsive Spectrum Disorders whose support significantly aided in the promotion and recruitment of the thesis studies. I would also like to express a special thanks to Sabrina Richards for her support in transcribing the interviews of Chapter 8.

My acknowledgments would not be complete without mentioning those closest to me. I'd like to start by thanking my mother, Fatma; this thesis would have been impossible without her unwavering support, kindness and love. I thank her for being there unconditionally, through both the smiles and the difficult moments. My Nene, Nazen, also played a monumental part in this journey. I remember her being in awe of my undergraduate psychology textbooks – I hope that she would feel the same pride if she could read my thesis now.

To my Husband Ergin, I extend my heartfelt thanks for his years of encouragement, love and support. His belief in me, especially during times where I doubted myself, has meant more than words can express. This thesis is his as much as it is mine, and he certainly deserves a holiday.

While I do not have enough words to name everyone individually, I give my sincere thanks to all whose names do not appear here – your presence and support has not gone unnoticed.

My last thank you was inspired by physicist, Jack Hetherington, who co-authored a paper with his cat under the name of Felis Domesticus Chester Willard. Whilst I can't quite credit my own cats, Chai and Louis, for any research or literary contributions, I would like to thank them for bringing warmth and comfort to the countless hours spent writing this thesis.

Abstract

Obsessive-compulsive disorder (OCD) is a debilitating mental health condition that has a significant impact on daily functioning, with this impact potentially extending to eating behaviours. However, the current literature base presents a limited understanding of eating patterns amongst individuals with OCD. This limited understanding poses a concern, as OCD is often seen as a risk factor for both eating disorders and physical health issues. To address these gaps in understanding, the current thesis had two key aims: first, to examine atypical eating behaviours among adults with OCD and/or obsessive-compulsive (OC) symptoms; and second, to explore the underlying factors that may contribute towards atypical eating behaviours in this population. The exploration of atypical eating behaviours encompassed not only eating disorders but also subclinical eating patterns, such as selective eating (i.e., food fussiness), which do not meet the diagnostic threshold for an eating disorder.

The thesis adopted a mixed methods design to gain a comprehensive overview of atypical eating behaviours in those with OCD and/or OC symptoms. An initial scoping review was conducted to understand the extent of current scientific knowledge on atypical eating behaviours in this population. Gaps in knowledge were then used to formulate the empirical studies of the thesis, which were undertaken in two parts. Section I examined atypical eating behaviours among adults with elevated OC symptoms in the general population, while Section II focused specifically on individuals with a diagnosis of OCD, drawing on the perspectives of those with a lived experience, as well as healthcare professionals. The studies of Section I utilised self-report questionnaires, whereas Section II adopted both self-report questionnaires and semi-structured interviews.

Findings from the current thesis revealed that adults diagnosed with OCD, as well as individuals in the general population with elevated OC symptoms, frequently engage in atypical eating behaviours that vary in both type and severity. Among adults in the general population who exhibit greater OC symptomatology, atypical eating behaviours appeared to be underpinned by factors such as perfectionism, emotion regulation and sensory sensitivity. However, for those with OCD, the relationship between atypical eating and OC symptoms was more complicated and affected by specific OC symptoms (e.g., contamination), characteristics of OCD (e.g., harm avoidance), transdiagnostic factors and co-occurring disorders, such as autism spectrum disorder and eating disorders. Despite atypical eating behaviours posing significant impairments to daily functioning, individuals with OCD and healthcare professionals reported barriers in accessing treatment for them.

The thesis findings highlight the need to acknowledge that individuals with OCD and/or OC symptoms may experience significant challenges with their eating behaviours. It is of vital importance to address these issues in clinical practice to reduce the complex psychological and physical burden posed by atypical eating.

Table of Contents

Section I: Obsessive-compulsive symptoms and atypical eating behaviours in the general population

Section II: Atypical eating behaviours in the OCD population

List of Tables and Figures

Tables

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Figures

Chapter 1: Introduction

Overarching aims of the thesis

Previous research suggests eating disorders to be frequently present in individuals with obsessive-compulsive disorder (OCD) and/or individuals in the general population showing high levels of obsessive-compulsive (OC) symptoms. However, less is known about the broader presentation of atypical eating behaviours, which include those that are not within the remit of clinical diagnostic thresholds. Moreover, it is unclear why those with OCD or OC symptoms may be at greater risk of developing such atypical eating behaviours. The overarching aims of the thesis were twofold: to explore the presence of atypical eating behaviours, including both eating disorders and non-clinical atypical eating behaviours, in adults with OCD or OC symptoms, and to better understand why atypical eating behaviours may be elevated in these groups. To achieve these aims, the thesis adopted an exploratory, mixed methods design to understand the presentation and nature of atypical eating behaviours in adults with OCD or OC symptoms, drawing on the perspectives of those affected, as well as healthcare professionals. The following introduction provides an overview of OCD and the atypical eating behaviours explored in the thesis.

An introduction to obsessive-compulsive disorder

Symptoms and prevalence

Obsessive-compulsive disorder is a chronic mental health condition characterised by obsessions and/or compulsions (American Psychiatric Association [APA], 2022; World Health Organisation [WHO], 2021). Obsessions are defined by recurrent intrusive thoughts, images or urges; for example, feeling contaminated or having taboo thoughts. Such obsessions are associated with marked anxiety and cause interference in an individual's daily life. Compulsions refer to repetitive behaviours, rituals or mental acts which an individual feels compelled to carry out to supress or neutralise obsessive thoughts or achieve a sense of 'completeness.' Examples of compulsions may include excessive handwashing and/or checking. These compulsive behaviours are time consuming and cause impairment in daily functioning, referring to an individual's ability to engage in usual activities, such as self-care, work and social interactions (Markarian et al., 2010).

Whilst those with OCD will experience obsessions and/or compulsions, the content of obsessions and compulsions can vary between individuals, indicating a degree of heterogeneity in the disorder (Moreno-Amador et al., 2023; Van Schalkwyk et al., 2016). Subsequently, obsessions and compulsions can be grouped into several symptom dimensions which include: cleaning (referring to fears of contamination or spreading disease); forbidden or taboo thoughts (e.g., harming others or having inappropriate thoughts); symmetry (obsessions regarding symmetry, repeating, ordering and counting) and hoarding (i.e., the inability to discard items due to the fear of a negative consequence, such as

harming a loved one; Bloch et al., 2008; Mataix-Cols et al., 2005). For example, individuals with OCD related to contamination concerns may present with obsessions regarding germs, bacteria or contracting and spreading disease. Such obsessions are followed by compulsive behaviours in attempt to alleviate the anxiety and distress caused by the intrusive thoughts; for example, showering for extended periods of time, excessive cleaning or handwashing, and compiling mental lists of 'contaminated' items to avoid (Riccardi et al., 2010). These compulsive behaviours temporarily alleviate symptoms of distress and anxiety, however maintaining a contamination-free environment is not entirely possible; hence, the cycle of obsessions and compulsions persist, leading to marked anxiety and distress which has a detrimental impact on general functioning.

OCD can begin at any age, including adulthood, but it is considered more common to start experiencing symptoms in late adolescence (Heyman et al., 2001). Symptoms often wax and wane throughout adulthood, but are typically chronic in presentation (Kichuk et al., 2013; Naftalovich et al., 2021), with studies reporting 12 month prevalence rates of OCD in the adult general population to be between 0.7% and 5.1% (Adam et al., 2012; CilliÇilli et al., 2004; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Ruscio et al., 2010). Whilst it has been reported that OCD is observed equally across males and females, there appears to be a difference in the symptoms that present (Lochner & Stein, 2001). For example, contamination symptoms are more prevalent in females, whereas symmetry and orderliness symptoms tend to be more common in males. Males are also more likely to experience early-onset OCD (i.e., during childhood) compared to post-adolescent OCD (Lochner & Stein, 2001; Tükel et al., 2005).

Approximately 70% of those with OCD also present with a co-occurring mental health condition or neurodevelopmental disorder (Sharma et al., 2021). Frequently reported comorbid mental health disorders include eating disorders, substance use disorders, personality disorders and mood disorders, as well as neurodevelopmental disorders such as autism spectrum disorder, attention-deficit hyperactivity disorder and tic disorders (Mancebo et al., 2009; Pallanti et al., 2011). Children with OCD are more likely to present with additional anxiety disorders, such as generalised anxiety disorder or social anxiety disorder. However, mood disorders, such as major depressive disorder or bipolar disorder, are more frequent in adults. Neurodevelopmental disorders have a similar prevalence across children and adults with OCD (Sharma et al., 2021).

Aetiology

OCD is a complex condition, with several mechanisms implicated in its development and maintenance, including biological, psychological and environmental factors. Regarding biological factors, research into the genetic underpinnings of OCD indicates that both childhood-onset and adulthood-onset OCD are heritable, with first-degree relatives exhibiting a greater risk of presenting with OCD (Blanco-Vieira et al., 2023; Pauls, 2010; Strom et al., 2024; van Grootheest et al., 2005). Moreover, certain chromosomes have also been identified as potential risk factors for OCD development in children (Mathews et al., 2012).

Anatomical and neurological abnormalities of the frontal cortex are also core to the presentation of OCD, and are thought to underlie inhibition and symptoms such as washing, checking and hoarding (De la Peña-Arteaga et al., 2022; Maia et al., 2008; Perera et al., 2023; Saxena & Rauch, 2000). In addition, research highlighting the effectiveness of selective serotonin reuptake inhibitors (SSRIs) in OCD has led to the suggestion that serotonin regulation is implicated with OCD symptoms (Biswas et

al., 2025; Brar et al., 2022; Hesse et al., 2005; Sinopoli et al., 2017; Soomro et al., 2008). Furthermore, growing evidence suggests other neurotransmitters, such as glutamate and dopamine, may also contribute towards the development of OCD (Biria et al., 2023; Dong et al., 2020; Karthik et al., 2020; Pittenger et al., 2011; Rajendram et al., 2017).

In addition to biological risk factors, environmental and psychological factors are also associated with the development of OCD. Notable environmental risk factors during childhood include traumatic experiences (e.g., sexual abuse or losing a parent), childhood adversity, social isolation, manipulative parenting styles and conduct problems (Aycicegi et al., 2002; Gothelf et al., 2004; Grisham et al., 2011; Mathews et al., 2008). Adverse perinatal experiences, such as low birth weight, preterm birth or respiratory difficulties have been also linked to OCD (Grisham et al., 2011). Moreover, socio-environmental factors are associated with OCD development and maintenance; these include lower socioeconomic status, stigma around mental health, racism and access to healthcare (Nicolini et al., 2018; Williams & Jahn, 2017).

Certain personality traits are also suggested to increase the likelihood of developing OCD. For example, research has found that children who display personality traits of general negative emotionality (e.g., increased reactivity to stressors and interpersonal alienation), constrained personality (e.g., adopting conventional norms and acting cautiously) and rigidity are more likely to develop OCD in later life (Grisham et al., 2011; Mathews et al., 2008; Pinto et al., 2015). Another personality trait associated with OCD is harm avoidance, where one may display pessimism, greater worry and fear of uncertainty (Gothelf et al., 2004; Richter et al., 1996). Harm avoidance is often linked to traumatic experiences, which highlights how interactions between environmental factors and personality traits may enable OCD symptoms (Gothelf et al., 2004).

Moreover, there are reports of OCD-like symptoms in adults with diseases of the central nervous system, such as multiple sclerosis (Foroughipour et al., 2012). In rare cases, children may also develop OCD because of autoimmune triggers associated with paediatric streptococcal infection or other inflammatory reactions (Orlovska et al., 2017). This presentation of secondary OCD occurs rapidly and often includes food restriction and involuntary movements, known as tics. Although the *Diagnostic Statistic Manual Text Revision* (5th ed., text rev.; DSM-5-TR; APA, 2022) and the *International Classification of Diseases* (11th rev.; ICD-11; WHO, 2019) have recognised secondary OCD, there are no established guidelines to support its diagnosis and treatment (Endres et al., 2022).

Assessment and treatment

In the United Kingdom, OCD can be formally assessed and diagnosed using guidelines from the ICD-11. The ICD-11 posits that a definitive diagnosis can be made if the individual experiences time consuming obsessional thoughts and/or compulsions for at least one hour per day, resulting in significant impairment in functioning. For example, the time-consuming nature of checking compulsions may cause difficulties in upholding employment, or the preoccupation with obsessive thoughts could limits an individual's ability to maintain necessary self-care. However, in some cases functioning may be maintained through considerable additional effort. The guidelines also highlight that individuals with OCD may vary in their level of insight regarding obsessions and compulsions; some may be able to identify that their obsessions are not true, whereas others may not be able deviate

from their beliefs. Similar guidance is also provided by the DSM-5-TR, which is used in the United States.

In addition to formal diagnostic guidelines, such as the ICD-11 or DSM-5-TR, adjunctive assessments are often used to determine symptom severity. For example, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989) is commonly used by healthcare professionals to assess the severity of OC symptoms and the interference which symptoms have on functioning. The scale also provides a symptom checklist, encompassing a vast range of obsessional thoughts and compulsions, which can be used to inform treatment. Alternatively, the Obsessive-Compulsive Inventory – Revised (OCI-R; Foa et al., 2002) is an 18-item self-report scale which assesses OC symptoms across six subtypes of symptoms: washing, checking, neutralising, obsessing, ordering and hoarding. The OCI-R is considered to have excellent psychometric properties and can be used to screen for OCD or subthreshold OC symptoms in research (Hajcak et al., 2004; Huppert et al., 2007).

The primary treatment for OCD includes psychological and pharmacological intervention; decisions regarding the most appropriate treatment are determined by the individual's symptom severity, age and response to previous interventions (National Institute for Health and Care Excellence [NICE], 2005). Psychological therapies, which include cognitive behavioural therapy (CBT) or exposure and response prevention (ERP), are deemed acceptable for both adults and children (NICE, 2005). These interventions aim to alter the cognitive and behavioural processes associated with intrusive thoughts and compulsions (Abramowitz, 2006). According to NICE guidelines (2005), individuals with more severe symptoms may need an extended period of psychological intervention, and it is recommended that children undergo psychological treatments with familial support.

Pharmacological interventions mainly consist of SSRIs, which support the treatment of OCD symptoms by preventing the absorption of serotonin, thus increasing serotonergic activity (Chu & Wadhwa, 2023). It is recommended that SSRIs are combined with psychological interventions, such as CBT or ERP, to achieve optimal treatment outcomes (Del Casale et al., 2019). Research also indicates that patients with OCD prefer combined treatments, rather than SSRIs alone (Patel & Simpson, 2010).

In most cases, interventions are provided within the community where the patient has access to health services, such as NHS Talking Therapies (formerly Improving Access to Psychological Therapies, IAPT) or specialist OCD services. However, a small percentage of those with complex OCD may require inpatient treatment if there is a risk to themselves or others. Of note, those without formally diagnosed OCD may also receive psychological intervention for their symptoms if they self-refer to certain services, such as NHS Talking Therapies.

The impact of obsessive-compulsive disorder

OCD is a debilitating illness which has profound effects on psychological and physical health, as well as overall functioning. Regarding psychological wellbeing, OCD is associated with various symptoms, including anxiety and depression (Citkowska-Kisielewska et al., 2019; Klein et al., 2020). Rates of suicidal ideation and suicide attempts are also more prevalent in OCD compared to the general population (Albert et al., 2019), with one meta-analysis suggesting that almost 50% of those with OCD experience suicidal ideation and around 14% attempt suicide (Pellegrini et al., 2020).

Compared to the general population, those with OCD are also more prone to increased mortality rates due to physical health complications and suicide (Fernández de la Cruz et al., 2022). Physical health complications range from moderate symptoms, which inhibit ability to function, to severe life-threatening illnesses. Moderate symptoms encompass arthritic conditions, frequent migraines, respiratory difficulties and overall disability (Witthauer et al., 2014). Severe physical complications include an increased risk of cardiovascular diseases, such as thromboembolism and heart failure, as well as metabolic syndromes and other circulatory system disorders (Isomura et al., 2018, 2021). Factors which may underlie these physical health complications include psychological stress and individual lifestyle factors (e.g., lack of physical activity, poor diet or smoking; Holmberg et al., 2024; Isomura et al., 2021). In severe cases, those with OCD symptoms requiring hospital treatment may present with life-threatening levels of self-neglect, incontinence and clinically significant abnormalities in physiological biomarkers of health (Drummond et al., 2012).

Of note, dermatological conditions and autoimmune skin diseases, such as psoriasis, alopecia or eczema are also frequent in the OCD population (Chou et al., 2023; Demet et al., 2005; Fineberg et al., 2003). The increased risk of dermatological conditions may result from shared genetic predispositions to dermatological conditions and OCD (Åkerlund et al., 2023; Murphy et al., 2010). Some skin conditions may also be environmental or secondary to OCD symptoms; for example, compulsive behaviours, such as excessive washing or skin picking, which leads to eczema or skin lesions (Tampa et al., 2015).

OCD symptoms have been shown to have negative effects on both physical and psychological wellbeing, along with a detrimental impact on overall functioning and quality of life. Research has reported that quality of life in individuals with OCD is significantly worse than that of the general population, as well as other clinical groups, such as those with substance use disorders and major depression (Bobes et al., 2001; Eisen et al., 2006). Specific components of OCD which contribute towards reduced quality of life are compulsions, depressive symptoms and impaired functioning (Jacoby et al., 2014; Kochar et al., 2023; Sahoo et al., 2017).

Reduced quality of life and impaired functioning are often associated with daily life difficulties, including the ability to work. A high proportion of those affected by OCD experience occupational impairment or disability, which poses a barrier to employment and can lead to the need for financial assistance (Patel et al., 2023). One particular study reported that 52% of those with OCD were unable to work due to their symptoms; those unable to work were more likely to be female and to report more severe OCD and depressive symptoms, as well as previous suicide attempts (Coban & Tan, 2019).

The chronic and debilitating nature of OCD poses significant concerns for those experiencing symptoms, as well as caregivers and family members, particularly if symptoms are not managed effectively. For example, research has shown that relatives of those with OCD, compared to controls, are more likely to experience strained familial relationships, restricted family life and leisure, and impaired physical, psychological and social wellbeing (Black et al., 1998; Cicek et al., 2013; Stengler-Wenzke et al., 2007). Furthermore, relatives are also more likely to also present with mental health disorders, such as major depressive disorder, highlighting the global impact of OCD (Cicek et al., 2013).

Obsessive-compulsive symptoms as a continuum

OC symptoms can be placed on a continuum ranging from less severe symptoms to a mental health disorder (i.e., OCD). As with OCD, those with OC symptoms may experience obsessions and engage

in compulsive behaviours; however, these do not warrant an OCD diagnosis as they are perceived to be less distressing and cause fewer impairments in daily functioning (Black & Gaffney, 2008; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Fineberg, Hengartner, Bergbaum, Gale, Rössler, et al., 2013a, 2013; Sharma & Math, 2019).

Regarding prevalence, OC symptoms tend to be more common in the general population than diagnosed OCD, with study estimates ranging from 2% to 20%, and one study estimating that up to 80% of the general population experience obsessions (Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Fullana et al., 2009, 2010; Grabe et al., 2000; Jaisoorya et al., 2017; Rueppel et al., 2024; Valleni-basile et al., 1994). Moreover, research has also suggested that the prevalence of OC symptoms in the general population increased during the COVID-19 pandemic (Cunning & Hodes, 2022; Pozza et al., 2024; Silverman et al., 2024). This increase in OC symptomatology may, in part, be due to the social restrictions posed by lockdowns, disruptions to daily routines and greater emphasis on handwashing and cleanliness.

Whilst OC symptoms in the general population are perceived to be less debilitating, they are still associated with negative psychological outcomes such as distress, neuropsychological deficits, increased neuroticism and tension (Fineberg et al., 2013; Fullana et al., 2004; Kim et al., 2009; Rubenstein et al., 1993; Spinella, 2005). Those with OC symptoms are also more likely to experience anxiety and depressive disorders, substance dependence and atypical eating behaviours (Bang et al., 2020; Barnhart et al., 2021; Fineberg, Hengartner, Bergbaum, Gale, Rössler, et al., 2013b, 2013a; Grabe et al., 2001; Spinella, 2005). Moreover, it is suggested that OC symptoms often precede a full OCD diagnosis (Black & Gaffney, 2008; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013), potentially due to shared polygenes found in both individuals with OC symptoms and diagnosed OCD, suggesting a genetic risk across the OC spectrum (Strom et al., 2024).

An introduction to atypical eating behaviours

It has been observed that those with OCD or OC symptoms are more likely to display eating patterns which deviate from what is considered typical or healthy; these can be referred to as atypical eating behaviours (e.g., Bang et al., 2020; Kauer et al., 2015; Peters et al., 2019; Zickgraf & Barrada, 2022). At present, there is no clear definition for atypical eating behaviours, but in the current thesis, atypical eating behaviours are defined as a broad spectrum of pathological eating patterns, which have an adverse effect on one's physical and psychological wellbeing and functioning, contributing towards an unhealthy weight status or causing marked distress or anxiety.

In this thesis, atypical eating behaviours will also be addressed as being on continuum, with non-clinical atypical eating behaviours and eating disorders perceived as the opposite polar ends of this continuum. Placement of atypical eating behaviours within this continuum is determined by their level of severity, in terms of the negative impact on the individual and whether there is a need for clinical intervention. On the former end of the severity continuum are non-clinical atypical eating behaviours, which may include dieting and selective eating. While such behaviours are less severe, occur less frequently and do not warrant clinical intervention, they are often associated with negative consequences such as anxiety or reduced food consumption (e.g., Cotrufo et al., 1998; Kärkkäinen et al., 2018; Piran et al., 2007; Touchette et al., 2011). Moreover, there is a greater risk of developing an eating disorder when

non-clinical atypical eating behaviours, such as bingeing or undereating, are left unmanaged (Herle et al., 2020).

On the opposite end of the atypical eating behaviours continuum are eating disorders, which are severe pathological eating patterns recognised by the DSM-5-TR (APA, 2022) and the ICD-11 (WHO, 2021) to require clinical intervention. Examples of eating disorders include anorexia nervosa and bulimia nervosa, which are characterised by negative self-evaluations of one's body shape and intense fear of weight gain, leading towards pathological dieting behaviours (APA, 2022). More recently, extreme food avoidance, known as avoidant-restrictive food intake disorder (ARFID), has also been recognised as an eating disorder in the DSM-5 (APA, 2013) and ICD-11 (WHO, 2021). Detailed descriptions of eating disorders and non-clinical atypical eating behaviours are presented in the following subsections.

Eating disorders

Anorexia nervosa and bulimia nervosa

Anorexia nervosa and bulimia nervosa are eating disorders characterised by severe body dissatisfaction and intense fear of weight gain (APA, 2022; WHO, 2021). Those with anorexia nervosa, despite being underweight, attempt to prevent weight gain through a series of eating behaviours, which include excessive fasting or food restriction, and compensatory behaviours such as excessive exercise. Anorexia nervosa also has two subtypes: restricting type and binge-purge type. Individuals with restrictive type anorexia nervosa strictly limit their food consumption to prevent weight gain. In comparison, those with binge-purge type anorexia nervosa engage in bingeing episodes, which refers to eating larger than normal quantities of food, and then using compensatory behaviours, such as excessive exercise or laxative use, to negate the overconsumption of food.

Unlike anorexia nervosa, individuals with bulimia nervosa tend to be of normal weight or are overweight (Mehler, 2003). The atypical eating behaviours in bulimia nervosa are centred around recurrent binge-purge behaviours in attempt to manage weight. Bingeing episodes are characterised by loss of control when eating and consuming larger quantities of food than would be expected in a usual time period. Overconsumption of food leads to feelings of excessive guilt and shame, which then enables compensatory behaviours such as misusing laxatives or diuretics, self-induced vomiting, excessive exercise or fasting. Those who experience recurrent, impulsive bingeing episodes, but do not engage in compensatory behaviours or experience negative evaluations about their body shape, may instead be diagnosed with binge-eating disorder.

In some cases, diagnostic crossover may occur where one with anorexia nervosa may later be diagnosed with bulimia nervosa, and vice versa (Eddy et al., 2008; Monteleone et al., 2011; Tozzi et al., 2005). The Transdiagnostic Model of Eating disorders, proposed by Fairburn and colleagues (2003), suggests that shared risk factors and maintaining mechanisms across different eating disorders may account for this crossover. These mechanisms include cognitive processes, such as low self-esteem, perfectionism and mood intolerance, and interpersonal difficulties. Based on this model, it is proposed that treatment should focus on these underlying psychological and behavioural mechanisms that maintain the disorder, regardless of the presenting eating pathologies.

Those with anorexia nervosa and bulimia nervosa are more likely to experience negative effects on their psychological wellbeing, physical health and quality of life. Commonly reported physical health issues

include gastrointestinal difficulties, such as heartburn, bloating and nausea, as well as more serious complications, including gastrointestinal bleeding and ulcers (Norris et al., 2016; Zipfel et al., 2006). Oral health issues, including dental erosion, soft tissue lesions and ulcers, may also occur as a result of nutritional deficiencies and compensatory behaviours, such as self-induced vomiting (DeBate et al., 2005).

Several studies have noted that those with anorexia nervosa and bulimia nervosa report reduced quality of life, and this is more marked for those with severe symptoms (DeJong et al., 2013; Mond et al., 2005; van Hoeken & Hoek, 2020). Individuals with anorexia nervosa and bulimia nervosa also display a heightened risk for OCD, mood disorders, substance abuse and self-harm behaviours (Drakes et al., 2021; Keski-Rahkonen & Mustelin, 2016). Mortality rates and suicide rates are also elevated in these groups, particularly for those with anorexia nervosa (Keski-Rahkonen & Mustelin, 2016; Smink et al., 2012; van Hoeken & Hoek, 2020).

Anorexia nervosa and bulimia nervosa can be diagnosed using guidance from the DSM-5-TR or the ICD-11, but there are also measures which can aid in the assessment of these eating disorders; for example, the Eating Disorder Examination (EDE; (Fairburn et al., 1993), which is a semi-structured clinical diagnostic tool for anorexia nervosa, bulimia nervosa or binge-eating disorder, or the self-report version known as the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2009). Alternatively, continuous measurement tools, such as the Eating Attitudes Test – 26 Item (EAT-26; (Garner et al., 1982), can be used to identify whether one presents with clinically significant eating disorder symptoms related to anorexia nervosa or bulimia nervosa. Those who score above the clinical cut off margin (20≤) on the EAT-26 are likely to present with an eating disorder.

Anorexia nervosa and bulimia nervosa symptoms

As with OC symptoms, not all symptoms of anorexia nervosa and bulimia nervosa will warrant a diagnosis of an eating disorder; these symptoms are considered subclinical or subthreshold as they occur less frequently and tend to be less severe (Pike & Striegel-Moore, 1997). The exact prevalence of anorexia nervosa and bulimia nervosa symptoms in the general population is unknown. However, research has reported that symptoms are more prevalent than full threshold eating disorders (Isomaa et al., 2009; Szabó & Túry, 1995), with subthreshold symptoms occurring in approximately 10% of individuals, compared to 1-2% for full threshold eating disorders (Cotrufo et al., 1998; Solmi et al., 2014). Increased prevalence rates of eating disorder symptoms are also observed among certain groups, such as athletes and members of the LGBT community, indicating that some individuals may be more vulnerable to developing these atypical eating behaviours (Beals & Manore, 1994; Parker & Harriger, 2020; Riebl et al., 2007; Sundgot-Borgen & Torstveit, 2004, 2010).

Although subclinical eating disorder symptoms do not warrant a clinical diagnosis, they are associated with adverse effects on physical health, psychological wellbeing, social functioning and quality of life. With regard to physical health, those with subthreshold symptoms may experience amenorrhea, reduced bone mass and low energy, and may also report poorer self-rated physical health and increased somatic symptoms (Beals & Manore, 1994; Coelho et al., 2013; Cotrufo et al., 1998; Kärkkäinen et al., 2018; Piran et al., 2007). Moreover, eating disorder symptoms are associated with reduced happiness, greater psychopathological difficulties, such as increased mood and anxiety disorders, and impaired social functioning (Cotrufo et al., 1998; Kärkkäinen et al., 2018; Piran et al., 2007; Touchette et al., 2011). It has also been observed that subthreshold eating disorder symptoms are associated with eating disorder

development in later life, hence earlier identification of these symptoms are imperative (Herle et al., 2020; Herzog et al., 1993; McClelland et al., 2020).

To assess eating disorder symptoms associated with anorexia nervosa and bulimia nervosa, continuous measures are recommended to understand the severity and frequency of the eating disturbances (Kärkkäinen et al., 2018). For example, self-report tools such as the EAT-26 (Garner et al., 1982) can be used to assess subthreshold eating disorder symptoms.

Avoidant-restrictive food intake disorder

In the DSM (5th ed., APA, 2013), avoidant-restrictive food intake disorder (ARFID) was introduced as a feeding and eating disorder characterised by extreme food avoidance, resulting in weight loss, nutritional deficiency, dependence on enteral feeding or supplements, and marked interference in psychosocial functioning. While food avoidance is also present in other eating disorders, such as anorexia nervosa, food avoidance in ARFID is not driven by body dissatisfaction or used to manage weight. Instead, food avoidance in ARFID is characterised by three distinct profiles: selective eating due to sensory sensitivity; fear of aversive consequences associated with food or eating; and lack of appetite or interest in food or eating. Avoidance due to sensory sensitivity refers to the sensory properties of food (e.g., smell, texture or taste) that an individual may find intolerable and subsequently avoid. In comparison, fear of aversive consequences associated with eating refers to avoiding food due to the risk of choking, vomiting or other unpleasant implications associated with eating. Lastly, a lack of interest in food or eating is related to reduced appetite and lacking the desire to eat. These pathological eating patterns often occur among individuals with autism spectrum disorder, where increased prevalence rates of ARFID present (Sader et al., 2025).

Each of the ARFID profiles result in a lack of variety in diet and reduced consumption of food, with subsequent adverse effects on physical health, growth and development. Children with ARFID are more likely to be underweight, have inhibited growth and physical health complications, such as gastrointestinal issues and pulmonary related diseases (Eddy et al., 2015; Krom et al., 2019). In some cases, children may be entirely dependent on enteral feeding (food intake via the gastrointestinal tract) and nutritional supplements (Williams et al., 2015). These physical health complications can also persist into adulthood and, in some cases, adults with ARFID may require medical stabilisation in hospital (Nitsch et al., 2023). Like other eating disorders, ARFID can also result in psychological distress, impaired social functioning and reduced quality of life (Cañas et al., 2021; Hay et al., 2017; Iron-Segev et al., 2020; Zickgraf, Murray, et al., 2019).

The most commonly used tool to screen for ARFID in research participants is the Nine-Item ARFID screen (NIAS; Zickgraf & Ellis, 2018). The NIAS is comprised of three subscales which correspond to the three ARFID profiles: sensory sensitivity, lack of appetite and fear of eating. It is proposed that any NIAS scores indicating the presence of ARFID should be further reaffirmed using other eating disorder measurements, such as the EDE-Q, to examine whether an ARFID diagnosis is warranted (Murray et al., 2021).

Non-clinical atypical eating behaviours

Food avoidant behaviours

Food avoidance refers to all movements an individual makes away from food; for example, emotional undereating (eating less in response to negative affect), slowness when eating and avoiding food due to a lack of appetite. Typically, food avoidance presents during childhood and wanes as the child approaches adulthood. However, in some cases, food avoidance habits established during childhood can persist into adulthood (Dovey et al., 2008; Pesch et al., 2020).

The two most explored food avoidance behaviours are selective eating and food neophobia. Selective eating, often referred to as 'picky eating' or 'food fussiness', is characterised by the rejection of a wide range of foods, which leads to reduced food consumption and a less varied diet (Dovey et al., 2008; Van Tine et al., 2017). Food neophobia is considered a subcategory of selective eating, but represents a specific phenotype of avoidant eating where the individual avoids only novel or unfamiliar foods

Food avoidance behaviours are associated with a range of negative consequences. For example, food avoidant individuals are at greater risk of nutritional deficiencies due to the lack of variety in their diet, despite not exhibiting weight concerns (Ellis et al., 2018; Galloway et al., 2005; Volkert et al., 2016). If food avoidance behaviours are unmanaged during childhood, there is a risk of the nutritional deficiencies and health-related issues persisting into adulthood (Dovey et al., 2008). Moreover, those engaging in food avoidance are also likely to report psychopathological symptoms, such as increased anxiety and depression (Ellis et al., 2018; Galloway et al., 2003; Torres et al., 2020), and reduced social functioning, which negatively effects quality of life, work and educational performance (Ellis et al., 2018; Zickgraf et al., 2016).

There are several tools which can be used to assess food avoidance behaviours in adults. The Adult Eating Behaviour Questionnaire (Hunot et al., 2016) provides a general overview of food avoidance and food approach behaviours (described in the following subsection) through eight independent subscales. In particular, the food fussiness subscale of the questionnaire can be used to measure selective eating and food neophobic behaviours. Alternatively, The Adult Picky Eating Questionnaire (Ellis et al., 2017) and the Food Neophobia Scale (Pliner & Hobden, 1992) can be used to assess selective eating and food neophobia, respectively, to provide further insight into these behaviours.

Food approach behaviours

Food approach behaviours refer to all movements an individual makes towards food. Examples of these atypical eating behaviours include emotional overeating (eating in response to negative affect), increased responsivity towards foods (the urge to eat in the presence of food) and increased eating due to higher levels of hunger and greater enjoyment of food (Hunot et al., 2016).

Food approach behaviours are also associated with several negative consequences. For example, studies of children have indicated that food approach behaviours are linked to higher body-mass index, obesity and behavioural markers of obesity, such as eating in the absence of hunger, increased energy intake and faster eating rates (Carnell & Wardle, 2007; Gross et al., 2016; Özdemir & Bilgic, 2018). Overeating in childhood also poses a risk factor for binge-eating disorder in adolescence (Herle et al., 2020). Among adults, both emotional eating and food responsivity have been associated with increased bingeing

behaviours, preferences for unhealthy foods and feelings of guilt after an overeating episode (Bennett et al., 2013; Černelič-Bizjak & Guiné, 2021; Sobik et al., 2005).

Specific food approach behaviours can be measured independently in adults using scales such as the Food Cue Responsivity Scale for food responsivity (Kang Sim et al., 2023) or the Emotional Eater Questionnaire for emotional eating in obesity (Garaulet et al., 2012). Alternatively, the Adult Eating Behaviour Questionnaire provides a comprehensive overview of multiple types of food approach behaviours, including emotional overeating, food responsivity and overeating due to increased hunger and enjoyment of food (Hunot et al., 2016).

Addressing atypical eating in obsessive-compulsive disorder

Research has indicated that non-clinical atypical eating behaviours and eating disorders are associated with OCD and OC symptoms. OCD is also common comorbidity of those with eating disorders, meaning that people can experience both disorders simultaneously. Although OCD and eating disorders are considered distinct nosological conditions, they share similar symptomatology and cognitive-behavioural characteristics, such as obsessive, intrusive thoughts and compulsive behaviours (Altman & Shankman, 2009). For example, a person with an eating disorder may experience food-related obsessions (e.g., nutritional values) that are subsequently neutralised with repetitive, rigid behaviours or compulsions (e.g., calorie checking), similarly echoing the cycle of obsessions and compulsions in OCD.

Some studies have also considered OCD to be a risk factor for eating disorder development, which may be reflective of the similar developmental patterns across the two disorders (Cederlöf et al., 2015; Meier et al., 2015). Research suggests that both conditions often originate in childhood or adolescence, which are periods marked by heightened vulnerability to environmental, cognitive, and emotional influences (Barcaccia et al., 2015; Borrelli et al., 2024; Gonçalves et al., 2013; Mountford et al., 2007). Early manifestations of OC traits, such as perfectionism, rigidity, or harm avoidance, may interact with eating-related cognitions which contribute towards atypical eating behaviours over time. Similarly, early atypical eating behaviours, including food avoidance or emotional overeating, are associated with the development of disordered eating or OC symptoms (Derks et al., 2024; Herle et al., 2020; Zohar et al., 2025). Given the overlapping susceptibilities and developmental trajectories of OCD and eating disorders, it would be of importance to examine atypical eating behaviours among those with OCD.

The substantial overlap in symptomatology between OCD, OC symptoms and atypical eating behaviours has led to the suggestion that some eating disorders, such as anorexia nervosa and bulimia nervosa, may be a form of OCD, warranting classification within an obsessive-compulsive spectrum (Dingemans et al., 2022; Hollander et al., 2005; McElroy et al., 1994). Emerging evidence further suggests that non-clinical presentations of atypical eating behaviours, such as food avoidance (e.g., selective eating or food neophobia), may also be linked to OCD and elevated OC symptoms (e.g., Barnhart et al., 2021; Peters et al., 2019; Zickgraf et al., 2016). While such eating behaviours are generally considered less severe than eating disorders, recent studies have highlighted that, if left unmanaged, these atypical eating behaviours can worsen over time and may warrant clinical attention (Herle et al., 2020).

Although it is recognised that there is an association between OCD and atypical eating behaviours, the preponderance of research has centred on OCD and OC symptoms in those with a primary eating

disorder diagnosis. Consequently, fewer efforts have been directed towards understanding eating disorders and non-clinical atypical eating behaviours in OCD specifically. However, there is a need to address atypical eating behaviours in OCD for several reasons. For example, OCD is considered a risk factor for eating disorder development (e.g., Cederlöf et al., 2015; Meier et al., 2015; Micali et al., 2011), but the mechanisms underlying this association remain poorly understood.

Several aetiological factors have been identified in both eating disorders and non-clinical atypical eating behaviours, such as heightened or reduced sensory sensitivity towards food-related stimuli (Farrow & Coulthard, 2012; Zickgraf et al., 2022) and obsessive-compulsive personality traits (Connan et al., 2009; Degortes et al., 2014). Other factors include difficulties with emotion regulation (Prefit et al., 2019, 2019; Ruscitti et al., 2016), clinical perfectionism (Bento et al., 2010; Fairburn et al., 2003), anxiety (Ernst et al., 2021; Sala & Levinson, 2016) and cognitive rigidity (Arlt et al., 2016; Wang et al., 2021). Notably, these factors are also shared characteristics of OCD and eating disorders (Eichholz et al., 2020; Khosravani et al., 2020; Rieke & Anderson, 2009; Sternheim et al., 2022; Taylor et al., 2012; Vanzhula et al., 2021). Such transdiagnostic factors may not only predispose individuals to the development of OCD and/or eating disorders, but may also exacerbate atypical eating behaviours in OCD, which warrants further exploration.

Moreover, OCD is a debilitating disorder with profound effects on psychological wellbeing and functioning. Additional comorbidities can present complex challenges for those affected, with some research suggesting that those with co-occurring OCD and eating disorders present with more severe symptomatology and are more resistive to treatment attempts (Lewis et al., 2019). In addition to the psychological burden caused by co-occurring disorders, atypical eating behaviours can have a detrimental effect on physical health. As described earlier, atypical eating behaviours, particularly in their severe form, are accompanied by severe physical health complications which can result from malnutrition or the overconsumption of certain foods. A comprehensive understanding and earlier identification of atypical eating behaviours could help prevent serious health-related consequences, as well as additional psychological burden.

Collectively, OCD and atypical eating behaviours cost the NHS and society billions of pounds each year due to direct healthcare expenses and indirect costs. Indirect costs include reduced productivity due to illness and the broader social and economic burden on families and caregivers (Jenkins, 2022; Kochar et al., 2023; Simon et al., 2005). The UK government has recognised certain health issues to be concerns for public health; for example, cardiovascular diseases and obesity – both of which are associated atypical eating behaviours (Office for Health Improvement and Disparities, 2022; Public Health England, 2019). Whilst OCD alone is typically associated with a lower risk of obesity, those with commonly co-occurring disorders, such as depression, are more vulnerable (Abramovitch et al., 2019). Therefore, understanding the presentation and risks of atypical eating in OCD may help to reduce incidences of further difficulties which require more resources.

Thesis aims and structure

The overarching aim of the thesis was to gain a comprehensive overview of the atypical eating behaviours which present in adults with OCD or OC symptoms; particular attention was given to eating disorders, as well as non-clinical atypical eating behaviours (i.e., less severe eating pathologies),

reflecting the view that these behaviours exist along a continuum of severity. Prior to the empirical chapters, a scoping review was conducted to examine the current scientific literature on the relationship between OCD, OC symptoms and atypical eating behaviours. The scoping review included research investigating the relationship between atypical eating behaviours and OC symptoms across both the OCD and general population, with the aim of identifying current gaps in the literature to inform the subsequent empirical studies.

Thereafter, the thesis was separated into two parts, which reflected the population being studied. Section I (Chapters 3–5) describes two cross-sectional studies which focused on understanding how OC symptoms related to the spectrum of atypical eating behaviours in the general population. Chapters 3 and 4 investigated whether OC symptoms were associated with a range of non-clinical atypical behaviours (i.e., food avoidance and food approach) and severe eating behaviours (i.e., eating disorder symptoms), respectively. Chapter 5 extended this exploration by examining whether the relationship between OC symptoms and eating disorder symptoms could be explained by alternative factors, such as sensory sensitivity, emotion regulation or perfectionism. Each of these studies utilised standardised self-report measures of OC symptoms, atypical eating behaviours and factors which may influence eating behaviours.

Section II of the thesis, referring to Chapters 6–8, investigated atypical eating in the clinical OCD population. In the first study (Chapter 6), atypical eating behaviours were compared between adults with OCD and age- and gender-matched controls from the general population. Similarly to Chapters 4 and 5, alternative factors, such as perfectionism, emotion regulation and cognitive rigidity, were examined as mediators of the relationship between OC symptoms and atypical eating behaviours. Atypical eating behaviours, OC symptoms and alternative factors underlying atypical eating behaviours were explored using standardised self-report measures, except for cognitive rigidity which was measured using the Wisconsin Card Sorting Task. Chapter 7 adopted a qualitative approach to explore the broader context of atypical eating behaviours, including diet, early experiences with eating and the effect of OCD on eating, in adults with OCD. The final empirical chapter, Chapter 8, aimed to characterise the clinical presentation of atypical eating behaviours in OCD from the perspectives of healthcare professionals who have worked with the OCD population. A mixed methods approach was used, consisting of a researcher-designed survey to understand which atypical eating behaviours were often observed in OCD, and an in-depth qualitative interview with a subset of survey respondents to understand the broader context of atypical eating in OCD.

Lastly, Chapter 9 integrated findings across all studies to provide an understanding of the relationship between OC symptoms and the broader spectrum of atypical eating behaviours, relative to both the general population and those with OCD. Future directions for research and implications for clinical practice were also discussed.

Chapter 2: Exploring atypical eating and obsessive-compulsive symptoms: A scoping review

*Under review with the European Journal of Eating Disorders

Introduction

Research has suggested that those with eating disorders, such as anorexia nervosa and bulimia nervosa, may additionally present with a co-occurring OCD diagnosis or elevated levels of OC symptoms (e.g., Breithaupt et al., 2014; Kambanis et al., 2020; van Passel et al., 2020). Similar patterns have also been observed among individuals with OCD, whereby those affected are more likely to display non-clinical atypical eating behaviours or experience a co-occurring eating disorder (e.g., Assunção, Lucas Da Conceição Costa, et al., 2012; Bang et al., 2020; Garcia et al., 2020). Whilst an association between OCD and atypical eating behaviours has been observed, most research to date centres on the presence of OCD and OC symptoms in individuals presenting with an eating disorder, particularly those characterised by dissatisfaction with shape and bodyweight (e.g., anorexia nervosa). Consequently, less is known about whether other atypical eating behaviours manifest in OCD or those with OC symptoms; for example, ARFID where avoidance is characterised by lack of appetite or interest in eating, fear of adverse consequences and/or sensory aversions to food.

Limitations in our understanding of the relationship between OC symptoms and atypical eating behaviours also extends to non-clinical forms of atypical eating, which are typically less severe and unlikely to require clinical intervention. However, non-clinical atypical eating behaviours, such as selective eating and restrictive eating symptoms, have both been linked to increased levels of OC symptoms (e.g., Barnhart et al., 2021; Pollack & Forbush, 2013). While food selectivity, coined for the inadequate variety and consumption of food, is not currently recognised as a clinical concern (Kerzner et al., 2015), if left untreated it can lead to nutritional deficiencies (Fildes et al., 2015; Galloway et al., 2005) and contribute to subclinical levels of eating disorder symptoms (Zickgraf et al., 2020). Moreover, eating behaviours leading to food avoidance or restriction are also associated with weight loss or slower growth development (Fernandez et al., 2020). Severe levels of food selectivity in adulthood are associated with less enjoyment of eating (Kauer et al., 2015), and greater impairment in quality of life related to eating (Wildes et al., 2012). Hence, it would be important to address such eating behaviours among those with OCD or those showing high levels of OC symptoms.

This scoping review aimed to provide an overview of the relationship between OC symptoms and atypical eating behaviours, including eating disorders and non-clinical atypical eating behaviours, across both the general population and individuals with OCD.

Method

Review methodology

A scoping review was proposed to address the overarching research question: What are the atypical eating behaviours that have been found in adults and children with OCD and/or those in the general population displaying high levels of OC symptoms? This research question was later revised to only consider atypical eating in adults with OCD or OC symptoms (see Results – Included Studies). Findings

from the scoping review aimed to provide foundational support for studies of the thesis, as well as future research, which addresses atypical eating behaviours in OCD and/or those showing high levels of OC symptoms.

Guidance from the JBI methodology for scoping reviews (Aromataris et al., 2024) and Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA; Tricco et al., 2018) were used to conduct the proposed scoping review. The scoping review was registered on OSF: https://osf.io/s8kan. No ethical approval was required for this review.

Search strategy

The literature search was carried out using PubMed, Science Direct, Scopus and PsychNet with the following search terms:

> *("obsessive-compulsive disorder" OR "OCD" OR "obsessive-compulsive symptoms ") AND ("problematic eating" OR "abnormal eating" OR "binge-eating" OR "disinhibited eating" OR "disturbed eating" OR "external eating" OR "dysregulated eating" OR "emotional eating" OR "maladaptive eating" OR "restrictive eating" OR "orthorexia nervosa" OR "anorexia nervosa" OR "bulimia nervosa" OR "binge-eating disorder" OR "picky eating" OR "selective eating" OR "food neophobia" OR "avoidant-restrictive food intake disorder")*

Search terms were kept broad to capture the breadth of atypical eating behaviours which may present in OCD or alongside elevated OC symptoms. In line with guidance from Haddaway and colleagues (2015), the first 200 results from Google Scholar were also screened for eligibility. Moreover, reference lists of eligible articles were manually scanned for relevant articles. The literature search was initially carried out in 2022 and then updated in March 2025. Research databases are being monitored for new articles that may be relevant to the scoping review.

Study selection

Following searches on each literature database, all citations were exported to Rayyan (Ouzzani et al., 2016), an online literature review tool, to remove duplicates and identify eligible articles. An initial screen of article titles and abstracts was carried out, after which full text articles were assessed for eligibility. The inclusion criteria for eligible articles were as follows:

- Participants must have either (i) diagnosis of OCD and/or (ii) have completed a measure of OCD and/or OC symptoms (e.g., OCI-R or Y-BOCS)
- Participants may be from the clinical OCD population or the general population
- Studies must examine atypical eating behaviours, either eating disorder symptoms or non-clinical atypical eating behaviours, and consider the relationship between OC symptoms and atypical eating behaviours
- Use of qualitative and/or quantitative methodologies

There were no restrictions on the geographical location of the research or the age of the participants. However, age was further refined during the scoping review process (see Results – Included Studies).

Given the exploratory nature of the review, research articles were only excluded if they were systematic reviews, book chapters, case studies or did not include human participants. Studies not relevant to the literature review aim were also excluded. Furthermore, studies had to be published from 2013 onwards, which marked the introduction of the DSM-5 (APA, 2013).

Synthesis of results

In accordance with the JBI Manual for Evidence Synthesis, data from the eligible articles were extracted into a table to highlight core details of the studies (Aromataris et al., 2024). The eligible articles were then presented in a summary table detailing the study population, study aims, measures of atypical eating and OCD/OC symptoms, and key findings (Tables 2.1 and 2.2). A narrative summary of the findings was also provided.

For the narrative summary of the findings, the extracted data was reviewed and categorised into two themes based on the study population (i.e., the OCD population or general population). Thereafter, the atypical eating behaviours observed were used to organise the subthemes:

Theme 1: Atypical eating behaviours within obsessive-compulsive disorder
- Eating disorders
- Non-clinical atypical eating behaviours

Theme 2: Obsessive-compulsive symptoms and atypical eating behaviours in the general population
- Eating disorder symptoms and obsessive-compulsive symptoms
- Non-clinical atypical eating behaviours and obsessive-compulsive symptoms

Results

Included studies

Searches on PubMed, Scopus, Science Direct and PsychNet resulted in 8,270 records. Prior to screening, 2,024 duplicate records were removed, leaving a total of 6,246 articles. After title and abstract screening, 201 articles remained for the full text screening. Of these articles, 96 were eligible for the scoping review.

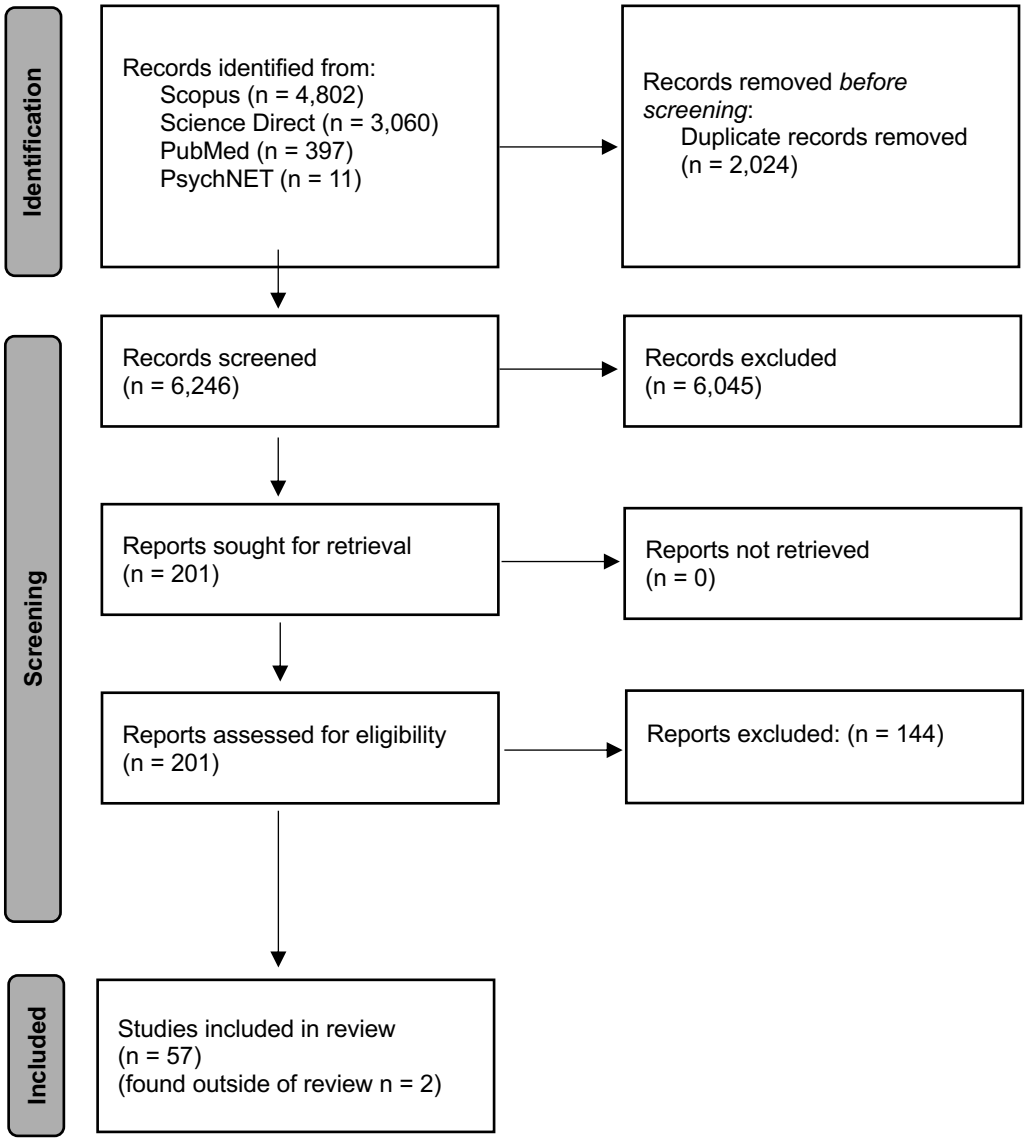
Given the large volume of eligible articles, it was decided to further refine the inclusion criteria. As the thesis aimed to explore atypical eating behaviours and OC symptoms in adults, the inclusion criteria was adjusted to focus only on studies of adults with OCD or OC symptoms, rather than children. In total, eight studies of children and adolescents were excluded from the eligible articles. Moreover, research studies which did not aim to explore atypical eating behaviours and OC symptoms were also excluded. Subsequently, studies with research questions beyond the scope of examining atypical eating and OC symptoms, or psychopathologies including OC symptoms (e.g., anxiety and depression, alongside OC symptoms, were excluded. For example, Steinman and colleagues (2016) examined the regulation of sensory information between healthy controls, those with OCD, an eating disorder or social anxiety disorder. Whilst the study required all participants to complete a measure of eating disorder symptoms, the study was designed to explore differences in sensorimotor gating between these

groups, rather than atypical eating. Therefore, the study did not sufficiently address differences in atypical eating behaviours between participant groups and was excluded.

After refining the inclusion criteria, a total of 59 studies were deemed eligible for the review; 57 of these studies were found during the literature search, and two were found outside of the search. The study selection process is reported in Figure 2.1 using the PRISMA extension for Scoping Reviews (Tricco et al., 2018), and summaries of the eligible studies are provided in Tables 2.1 and 2.2.

Figure 2.1.

PRISMA diagram



Characteristics of included studies

Studies of the OCD population

The participants in the studies corresponded to 22,358 adults with OCD. Among OCD participants, there were a total of 12,421 females (note: some studies reported the gender of the whole study sample, which may have included controls; this figure only includes studies which reported the number of females in OCD samples). Mean ages for participants in these studies ranged between 30.6 and 41.4 years, and the studies were conducted across Europe, Asia, North America, South America and Oceania. Full details of each study can be found in Table 2.1.

All studies adopted quantitative methodology. In most studies, atypical eating behaviours referred to the prevalence of eating disorders among those with OCD. Eating disorders and/or atypical eating behaviours were generally assessed using diagnostic guidelines (e.g., Structured Clinical Interview for DSM-IV axis I disorders; First et al., 1997), variations of the Eating Disorder Questionnaire (Fairburn et al., 1993) or variations of the Eating Disorder Attitudes Test (Garner et al., 1982; Garner & Garfinkel, 1979). Details of all the instruments used are presented in Table 2.1.

General Population Studies

Studies of the general population which examined OC symptoms and atypical eating behaviours consisted of 19,990 participants, of which 13,649 were female. The mean age of the participants ranged between 18.8 to 42.7 years, and the majority of studies were carried out in Europe, North America and Asia. Details of each study are presented in Table 2.2.

All but one study used quantitative methodologies. The most used measures of OC symptoms were the Obsessive-Compulsive Inventory – Revised (Foa et al., 2002) and the Maudsley Obsessive Compulsive Inventory (Hodgson & Rachman, 1977). Various measures were used to assess atypical eating behaviours. Full details of these studies are presented in Table 2.2.

Table 2.1.

Summary of OCD population studies

Author(s), (year of publication)	Participants, gender, age, diagnosis, country of research	Purpose	OC symptom and eating measures used	Findings
Torresan et al. (2013)	OCD *N* = 858 Females *n* = 504 (58.7%) Age *M* = 35.4*, SD* = 12.1 Brazil	Examine comorbidity in OCD	Yale-Brown Obsessive Compulsive Scale Structured Clinical Interview for Diagnosis of Axis I DSM-IV Disorders	12.8% prevalence rate of eating disorders in OCD In general, females with OCD were more likely to have an eating disorder compared to males with OCD, particularly anorexia nervosa and bulimia nervosa. There was no difference in rates of binge-eating disorder between males and females.
Cederlöf et al. (2015)	OCD *n* = 19,814 Females *n* ≈11,195 (56.5%) Anorexia nervosa *n* = 8,462 Females *n* ≈ 7.920 (93.6%) Adult participants, ages not provided Sweden	Longitudinal study to explore the overlap between OCD and anorexia nervosa	National Patient Register (Sweden)	Those with antecedent OCD had a four-fold risk of developing anorexia nervosa at follow up; this risk was greater for males (16-fold risk for females, 37-fold risk for males) Those with prior anorexia nervosa had a 10-fold risk of developing OCD

Poyraz et al. (2015)	OCD *n* = 49 Females *n* = 36 (73.5%) Age *M* = 31.37, *SD* = 10.97 Panic disorder *n* = 44 Females *n* = 30 (68.2%) Age *M* = 33.43, *SD* = 9.96 Generalised anxiety disorder *n* = 37 Females *n* = 31 (83.8%) Age *M* = 35.03, *SD* = 9.58 Türkiye	To investigate the relationship between orthorexia nervosa and OC symptoms in OCD, generalised anxiety disorder and panic disorder	Padua Inventory Washington State University Revision Eating Attitudes Test – 40 ORTO-11	Eating disorder symptoms and orthorexia nervosa did not differ between those with OCD, panic disorder and generalised anxiety disorder OC symptoms were associated with orthorexia nervosa symptoms
Tyagi et al. (2015)	OCD *n* = 135 Non-OCD anxiety disorders *n* = 44 Age of entire sample *M* = 37.5, *SD* = 13.5 Gender of entire sample Females *n* ≈ 98 (54.8%) England, United Kingdom	To compare the prevalence of eating disorders in OCD and other anxiety disorders	SCOFF Questionnaire International Classification of Diseases and Related Health Problems (10th version)	No significant difference in the prevalence rates of eating disorders between OCD and other anxiety groups
Williams et al. (2017)	OCD *n* = 75 Females *n* ≈ 42 (56.8%) Age *M* = 41.4, *SD* = 12.3 United States of America	To explore comorbidities of OCD in underrepresented populations	Structured Clinical Interview for Diagnosis of Axis I DSM-IV Disorders Yale-Brown Obsessive Compulsive Scale	4.1% of OCD participants had binge-eating disorder at some point during their lifetime

				Anorexia nervosa and bulimia nervosa were not observed among participants
Ay & Aytas (2018)	OCD *n* = 60 Gender split* *n* = 31/29 Age *M* = 31.33, *SD* = 9.44 HC *n* = 60 Gender split* *n* = 31/29 Age *M* = 31.10, *SD* = 6.92 **Gender not reported* Türkiye	To investigate the eating disorder attitudes in OCD and explore the relationship between distress tolerance and eating attitudes	The Pauda Inventory Eating Attitudes Test – 26 Distress Tolerance Scale	OCD participants had significantly higher eating disorder symptoms and poorer distress tolerance compared to controls OCD participants with greater eating disorder symptoms had more severe overall OC symptoms OC symptoms correlated with eating disorder symptoms; eating disorder symptoms associated with poorer distress tolerance
Hofer et al. (2018)	General population *n* = 3,021 of which, *n* = 55 met OCD criteria Participants followed up between ages of 14-24 years Details of gender not provided Germany	To examine whether OCD is a risk for mental health disorders	Munich-Composite International-Diagnostic Interview	OCD was associated with the development of bulimia nervosa, but not anorexia nervosa. In those diagnosed with OCD, attributable fractions suggested 85.3% of bulimia nervosa cases were linked to the OCD

Peters et al. (2019)	Anxiety disorders *n* = 7,221, of which OCD *n* = 83 Females (OCD) *n* ≈ 50 (60.5%) Age (OCD) *M* = 37.6, *SD* = 2.4 Canada (data obtained from England, United Kingdom)	To examine the effect of mood instability on the relationship between anxiety disorders and self-injury and binge-purge behaviours	Clinical Interview Schedule-Revised Structured Clinical Interview for DSM-IV Axis II Personality Disorders	12.8% of OCD participants engaged in binge-purge behaviours OCD could predict binge-purge behaviours, but this effect reduced when considering mood instability and impulsivity, particularly mood instability
Bang et al. (2020)	OCD *n* = 132 Females *n* = 94 (71.2%) Age *M* = 33.92, *SD* = 8.95 HC *n* = 260 Females *n* = 233 (89.6%) Age *M* = 32.44, *SD* = 5.75 Norway	To examine the prevalence of eating disorders in OCD participants and controls	Obsessive-Compulsive Inventory – Revised Eating Disorder Examination Questionnaire	Eating disorder symptoms did not differ between OCD participants and controls Female OCD participants were more likely to meet the threshold for an eating disorder compared to healthy controls
Yılmaz et al. (2020)	OCD *n* = 63 Females *n* = 40 (63.5%) Age *M* = 34.70, *SD* = 10.50 Healthy controls (non-exercisers) *n* = 63 Females *n* = 35 (55.6%) Age *M* = 32.75, *SD* = 12.58 Healthy controls (exercisers) *n* = 63 Males *n* = 35 (55.6%) Age *M* = 29.00, *SD* = 7.85	To explore orthorexia nervosa symptoms in those with OCD, as well as healthy controls who engage in exercise	Yale-Brown Obsessive Compulsive Scale Eating Attitudes Test – 40 ORTO-11	Eating disorder symptoms in OCD and the healthy control exercise group did not differ, but were greater than the healthy control non-exercise group The healthy control exercise group had greater orthorexia nervosa symptoms compared to the OCD group; OCD group and the healthy control non-

	Türkiye			exercise group did not differ on orthorexia nervosa symptoms No correlation between OC symptoms and orthorexia nervosa in the OCD group In the OCD group, eating disorder symptoms were linked to orthorexia nervosa
Hessler-Kaufmann et al. (2021)	OCD *n* = 152 Females *n* = 90 (59&) Age *M* = 33.1, *SD* = 15.9 Germany	To examine the prevalence of orthorexia nervosa symptoms in inpatients	Düsseldorf Orthorexia Scale	At admission, 2% of OCD patients had orthorexia nervosa at admission and 3.7% at discharge. This change was not significant
Kaczkurkin et al. (2021)	Anxiety or anxiety related disorders *N* = 329, of which OCD *n* = 131 Age (OCD) *M*= 29.77, *SD* = 11.30) Females (OCD) *n* ≈ 69 (52.9%) United States of America	To explore whether perfectionism and depression explains the relationship between OC symptoms and eating pathology	Obsessive-Compulsive Inventory – Revised Clinical Impairment Questionnaire	Weak, positive correlation between OC symptoms and eating pathology OC symptoms could predict eating pathology Perfectionism and depression partially mediated the relationship between OC symptoms and eating pathology

				OC symptoms had a direct effect on eating pathology when controlling for perfectionism and depression, but the effect of OCI symptoms was reduced when including these factors *Note: all analyses conducted on total sample, including OCD, anxiety spectrum disorders and major depressive disorder*
Vaccari et al. (2021)	OCD *n* = 50 Females *n* = 16 (32%) Age *M* = 38.3, *SD* = 12.7 Anxiety spectrum disorders *n* = 42 Females *n* = 35 (83.3%) Age *M* = 46.2, *SD* = 13.7 HC *n* = 253 Females *n* = 135 (57.2%) Age *M* = 34.5, *SD* = 13.5 Italy	Explore the prevalence of orthorexia nervosa in OCD compared to participants with anxiety disorders and healthy controls	Obsessive-Compulsive Inventory – Revised ORTO-15	Prevalence of orthorexia nervosa was similar between OCD, anxiety disorders and healthy controls The OCD group did not have a greater risk for orthorexia nervosa compared to controls and anxiety disorders Those restricting their diet were more likely to display orthorexia nervosa symptoms
Danner et al. (2022)	OCD *n* = 419 Females *n* ≈ 233 (55.8%) Age *M* = 36.6, *SD* = 10.92 Netherlands	Investigate the relationship between OC symptoms and eating disorders in OCD	Pauda Inventory-Revised Yale-Brown Obsessive Compulsive Scale	10.5% of the OCD sample had a lifetime eating disorder Those with OCD and an eating disorder had more impulsive

			Structured Clinical Interview for Diagnosis of Axis I DSM-IV Disorders	urges and depression and anxiety symptoms, compared to those without an eating disorder
Rai et al. (2022)	OCD *n* = 150 Females *n* = 52 (34.7%) Age *M* = 30.57, *SD* = 10.26 HC *n* = 131 Females *n* = 45 (34.4%) Age *M* = 31.92, *SD* = 10.15 India	To explore behavioural addictions, including food addictions, in OCD and healthy controls	Yale-Brown Obsessive Compulsive Scale Eating Attitudes Test- 26 (Bulimia and Food Preoccupation Subscale)	OCD participants and healthy controls had similar prevalence rates of food addiction (7.3% vs 8.4%), but OCD participants reported more severe food addiction symptoms than healthy controls overall
Cosh et al. (2023)	Self-identified dieters and/or having mental health symptoms *n* = 196 of which, *n* = 132 met OCD criteria Females (entire sample) *n* = 172 (87.3%) Non-binary/withheld *n* = 8 (4.1%) Age (entire sample) *M* = 34.7, *SD* = 14.2 Australia	To examine the relationship between orthorexia nervosa and eating disorders and OCD	Obsessive-Compulsive Inventory – Revised Eating Disorder Examination Questionnaire The Orthorexia Nervosa Inventory Eating Habits Questionnaire	Orthorexia nervosa symptoms could predict OC symptoms, but orthorexia nervosa had a stronger association with eating disorders rather than OCD *Note: findings are based on the total sample, in which 67% had OCD and 9.2% had probable anorexia nervosa. The remaining participants identified as dieting and/or having mental health symptoms but did not meet criteria for OCD or anorexia nervosa*

Note: ≈ gender *n* based on percentages provided by the authors

Scoping review

1. Atypical eating behaviours within obsessive-compulsive disorder

1.1. Eating disorders in obsessive-compulsive disorder

A high proportion of adults with OCD were reported to reach the threshold for an eating disorder, including anorexia nervosa, bulimia nervosa and binge-eating disorder. For example, Danner and colleagues (2022) observed that 10.5% of OCD participants experienced an eating disorder at some point during their lifetime, with anorexia nervosa and binge-eating disorder being the most frequently reported. Other researchers concur with the high rates of eating disorders reported in adults with OCD but noted binge eating disorder to be the most prevalent (Torresan et al., 2013). Although, in the case of Williams and colleagues (2017), no eating disorder other than binge-eating disorder (4.1%) was observed in a sample of African Americans with OCD, where culture may have acted as a protective factor against weight and shape concerns.

Adults with OCD were also more likely to reach the criteria for a probable eating disorder compared to controls (Bang et al., 2020), with prevalence rates not dissimilar to what has been observed in those with other anxiety-spectrum disorders (Tyagi et al., 2015). For example, Bang and colleagues (2020) found that when using the Eating Disorder Examination Questionnaire (EDE-Q) 22.6% of those with OCD, compared to 11.2% of healthy controls, surpassed the clinical cut-off for a likely eating disorder.

Moreover, some studies suggested that OCD should be considered a risk factor for developing an eating disorder. A longitudinal study found that individuals with OCD had an elevated risk of developing anorexia nervosa; males with OCD were identified as being the most vulnerable (Cederlöf et al., 2015). Furthermore, Hofer and colleagues (2018) found that adolescents with OCD were specifically at a greater risk of developing bulimia nervosa. Collectively, these findings suggest that those with OCD have an increased risk of developing an eating disorder, even if there is lack of agreement over which of the eating disorders is at greater risk.

1.2. Non-clinical atypical eating behaviours

1.2.1. Eating disorder symptoms

Eating disorder symptoms that are considered less severe and/or less frequent may not always warrant a diagnosis. Therefore, some studies have also examined eating disorder symptoms in this population, rather than only addressing those individuals reaching the threshold for an eating disorder. Adopting this approach, Peters and colleagues (2019) observed that bingeing and compensatory purging behaviours were reported by 12.8% of participants with OCD. Moreover, Kaczkurkin and colleagues (2021) observed that in a group of individuals with anxiety disorders, including OCD, there was a positive association between greater levels of OC symptoms and eating disorder symptomatology.

Adults with OCD have also been shown to report bingeing, purging, and compensatory behaviours to manage weight loss, and score higher on overall measures for eating disorders. For example, adults with OCD showing more severe OC symptoms were found to have greater eating disorder symptomatology (Ay & Aytas, 2018). However, one study suggested that those with OCD had similar levels of eating disorder symptomatology to healthy controls who led a more active lifestyle; both of these groups

showed higher levels of eating disorder symptoms to healthy controls who did not exercise (Yılmaz et al., 2020). Moreover, other studies have also found that individuals with OCD are not at a greater risk of eating disorder symptoms compared to some other clinical groups. For instance, Poyraz and colleagues (2015) reported that those with OCD display similar levels of eating disorder symptoms to those with anxiety disorders, including generalised anxiety disorder and panic disorder. These findings suggest that adults with OCD may not experience greater eating disorder symptomatology compared to other psychiatric groups.

It is possible that other factors influence the relationship between eating disorder symptoms and OC symptoms, rather than the relationship reflecting a direct effect of OC symptoms on eating disorder symptoms. For example, Peters and colleagues (2019) observed that the predictive effect of OCD on binge-purge behaviours was reduced when controlling for mood instability and impulsivity. Similarly, Kaczkurkin and colleagues (2021) observed that depressive symptoms reduced the effect of OC symptoms on eating disorder symptoms.

1.2.2. Orthorexia nervosa

Orthorexia nervosa refers to an obsessive focus on consuming foods perceived to be 'pure' or healthy', with the intention of promoting physical health (Bratman, 1997). Whilst eating healthily is not necessarily problematic, obsessions about eating healthily can lead to pathological eating behaviours, such as the meticulous analysis of food labels or ingredients, and rigid routines involving meal preparation. Researchers have suggested that orthorexia nervosa presents similarly to eating disorders, however, as it is not classified as an eating disorder, it will be considered a non-clinical atypical eating behaviour in the current scoping review (Łucka et al., 2019; Yılmaz et al., 2020).

There have been mixed findings regarding the relationship between OCD and orthorexia nervosa. One study reported that 2-3.7% of inpatients with OCD presented with orthorexia nervosa (Hessler-Kaufmann et al., 2021), and research by Poyraz and colleagues (2015) and Cosh and colleagues (2023) highlighted that increased levels of orthorexia nervosa symptoms in OCD corresponded to more severe levels of OC symptoms. However, other studies have observed no relationship between symptoms of orthorexia nervosa and OC symptoms (Yılmaz et al., 2020), and that those with OCD report similar levels of orthorexia nervosa to other clinical populations, such as those with anxiety and depressive disorders, as well as healthy controls (Poyraz et al., 2015; Vaccari et al., 2021; Yılmaz et al., 2020).

Although it remains unclear as to whether levels of orthorexia nervosa may or may not be elevated in OCD specifically, there are some factors which might increase the likelihood of these eating behaviours in this population. For example, Yılmaz and colleagues (2020) observed that individuals with OCD who express greater levels of eating disorder symptomatology, such as anorexia nervosa and bulimia nervosa, are more likely to report symptoms of orthorexia nervosa. Similarly, in a group of individuals who self-identified as dieters and/or having mental health symptoms (of which, 67% had OCD), symptoms of orthorexia nervosa were found to be more often associated (Cosh et al., 2023).

1.2.3. Food avoidance versus food approach behaviours

Only one study was found to have specifically examined food approach behaviours in OCD patients; no studies addressed food avoidance in OCD. Rai and colleagues (2022) observed no differences between OCD participants and healthy controls regarding the prevalence of food addictions. However, those with OCD as a group experienced more severe food addiction symptoms, characterised primarily

by the compulsive consumption of palatable and hyperpalatable food items, compared to the healthy control group. It is important to note that the Eating Attitude Test (EAT-26) was used to examine food addiction in this study, which is an assessment of eating disorders; hence, the findings of this study may be more reflective of bulimia nervosa or bingeing behaviours rather than food addiction per se. These results align with Peters and colleagues (2019) who found that binge eating behaviours, which can be considered a food approach behaviour, were also noted among those with OCD.

2. Obsessive-compulsive symptoms and atypical eating behaviours in the general population

2.2. Eating disorder symptoms and obsessive-compulsive symptoms

2.2.1. Anorexia nervosa and bulimia nervosa

Studies of adults in the general population have noted that higher levels of OC symptoms correspond to increased severity of eating disorder symptoms associated with anorexia nervosa and bulimia nervosa. For example, those with elevated levels of OC symptoms are more likely to exhibit greater levels of dietary restraint, bingeing or purging (Barnhart et al., 2021; Fekih-Romdhane et al., 2024; Gezer & Yalvaç, 2018; Zickgraf, Ellis, et al., 2019). A further study by Kinkel-Ram and colleagues (2022) also observed over a five-week period that the relationship between OC symptoms and eating disorder symptoms had a reciprocal relationship with OC obsessions, but not compulsions.

Some studies have also noted that those expressing greater anorexia and/or bulimia nervosa symptoms have an increased risk of severe OC symptoms compared to selective eaters and typical eaters (i.e., those who think about food when they need to, when they're hungry or need to plan a meal; Zickgraf et al. 2016). In contrast, individuals with clinically significant OC symptoms have been shown to exhibit similarly low levels of pathological dieting behaviours to those without OC symptoms, casting doubt as to whether those with OC symptoms are more prone to such symptoms (Belloch et al., 2016). However, the same study did observe that those demonstrating clinically significant OC symptoms were more likely to have intrusive thoughts about eating, a common finding amongst those with an eating disorder, such as anorexia nervosa.

Further research also proposed that specific eating disorder symptoms corresponded to certain OC symptoms. For example, Pollack and Forbush (2013) observed that OC checking and cleaning symptoms could predict dietary restraint, and that checking behaviours could predict binge eating behaviours. Moreover, in a separate study, which used a mixed sample of undergraduate students and adults with eating disorders, it was observed that secret bingeing and eating was associated with OC hoarding symptoms, and that obsessive symptoms were related specifically to concerns about being seen eating in public (Vanzhula et al., 2021). These findings posit that those who present with certain OC symptoms may then be more at risk of different eating disorder symptoms.

Importantly, some studies have found no direct association between OC symptoms and symptoms related to anorexia nervosa and bulimia nervosa. For example, findings from Latif and Moulding (2024) suggested that OC symptoms could not predict eating disorder symptoms when controlling for other factors, including emotion regulation, depression and anxiety.

Similarly, Pollack and Forbush (2013) observed that perfectionism and neuroticism mediated the relationship between OC symptoms and some eating disorder symptoms, whereas other studies have identified OC symptoms to mediate the relationship between perfectionism and eating disorder symptomatology (Fekih-Romdhane et al., 2024; Yang et al., 2022).

2.2.2. Binge-eating disorder

Binge-eating disorder symptoms have also been linked to OC symptoms. A study by Kim and colleagues (2018) observed greater OC symptoms in women with a healthy weight, engaging in binge-eating behaviours, compared to their counterparts without binging behaviours. In comparison, overweight women engaging in binge-eating had similar levels of OC symptoms to overweight women who did not binge. OC symptoms could also predict binge-eating in women with a healthy weight, but not overweight women. Moreover, students with greater OC symptoms have been found to engage in more bingeing behaviours (Schulte, 2016). However, whilst an initial association between OC symptoms and binge-eating was observed, OC symptoms could no longer predict binge-eating when controlling for emotional eating, indicating that other factors, particularly those pertaining to fluctuating mood and emotions, may also be implicated in this relationship.

2.2.3. Avoidant-restrictive food intake disorder

Two studies examined the relationship between OC symptoms and ARFID in the general population. Zickgraf and colleagues (2019) observed that greater levels of OC symptoms corresponded to more severe ARFID symptoms. Similarly, those with ARFID symptoms expressed elevated levels of OC symptoms comparable to those engaging in anorexia and/or bulimia nervosa eating behaviours, indicating that different presentations of eating disorder symptomatology are linked to greater levels of OC symptoms (Zickgraf et al., 2016).

Table 2.2.

Summary of general population studies

Author(s), (year of publication)	Participants, gender, age, diagnosis, country of research	Purpose	OC symptom and eating measures used	Findings
Pollack & Forbush (2013)	General population *n* = 407 Females *n* = 191 (46.9%) *M* = 38.24, *SD* = 13.51 United States of America	To examine why OC symptoms and eating disorder symptoms co-occur	The Schedule of Compulsions, Obsessions and Pathological Impulses Eating Disorder Examination Questionnaire Eating Disorder Inventory-3 The Three Factor Eating Questionnaire	OC checking, cleaning and rituals predicted body dissatisfaction Checking, cleaning and pathological impulses (negatively) predicted restraint Checking predicted binge-eating Perfectionism and neuroticism mediated the relationship between certain OC symptoms and eating disorder symptoms
Asil & Sürücüoğlu, (2015)	Dieticians *n* = 117 Females *n* = 101 (86.3%) Age *M*= 34, *SD* = 11.2 Türkiye	To examine orthorexia nervosa in dieticians	Maudsley Obsessive Compulsive Inventory Eating Attitudes Test – 40 ORTO-15	OC symptoms were not correlated with orthorexia nervosa, but those with orthorexia nervosa had higher OC symptoms compared to those without
Kauer et al. (2015)	Picky eaters *n* = 16 Age *M* = 22.56, *SD* = 5.92 Females *n* ≈ 9 (56%) Non-picky eaters *n* = 18 Age *M* = 31.00, *SD* = 9.77 Females *n* ≈ 12 (65%)	Examine correlates of picky eating in adults	The Pauda Inventory	Picky eaters had greater OC symptoms than non-picky eaters Picky eater status could predict OC symptoms

	United States of America			
Belloch et al. (2016)	OCD risk group *n* = 92 Females *n* ≈ 64 (69.6%) Age *M* = 23.12, *SD* = 4.83 Eating disorder risk group *n* = 41 Females *n* ≈ 33 (80.5%) Age *M* = 23.22, *SD* = 4.90 No-risk group *n* = 100 Females *n* = 69 (69.0%) Age *M* = 23.50, *SD* = 4.58 Spain	To explore OC and eating disorder related intrusive thoughts between those at risk for OCD or an eating disorder	The Clark-Beck Obsessive Compulsive Inventory Eating Attitudes Test – 26 Obsessional Intrusive Thoughts Inventory Eating Intrusive Thoughts Inventory	Those at risk of OCD had more intrusive thoughts about eating compared to controls, but less than those at risk of an eating disorder
Bundros et al. (2016)	Students *n* = 448 Females *n* = 325 (72.5%) Age *M*= 22.17, *SD* = 4.83 United States of America	To explore the relationship between orthorexia nervosa assessed by the Bratman Orthorexia Test and validated measures of eating, body dysmorphia and OC symptoms	Obsessive-Compulsive Inventory – Revised Eating Attitudes Test – 26 Bratman Orthorexia Test	OC symptoms were associated with eating disorder symptoms and orthorexia nervosa symptoms
Schulte (2016)	Students *n* = 236 Females *n* = 152 (64.6%) *M* = 19.78, *SD* = 1.45 United Arab Emirates	To examine predictors of binge-eating in students from the United Arab Emirates	Obsessive-Compulsive Inventory – Revised The Binge Eating Scale The Emotional Eating Scale The Weight- and Body-Related Shame and Guilt Scale	Greater OC symptoms correlated with binge eating, but OC symptoms could not predict binge eating when controlling for other factors, such as emotional eating

Zickgraf et al. (2016)	General population *n* = 325 Females *n* ≈ 164 (50.5%) *M* = 33.92, *SD* = 10.54 Picky eating support group *n* = 81 Females *n* ≈ 57 (70.3%) *M* = 40.42, *SD* = 13.31 United States of America	To compare picky eaters with and without ARFID symptoms to those with disordered eaters and typical eaters	Obsessive-Compulsive Inventory – Revised Eating Attitudes Test – 26 Single question to assess picky eating – are you a picky eater? Author developed ARFID questionnaire	Typical eaters had the lowest OC symptoms Disordered eating participants and ARFID participants had similarly high levels of OC symptoms ARFID participants expressed similar levels of OC symptoms to selective eaters
Brytek-Matera et al. (2017)	Students *n* = 120 Females *n* = 83 (69.2%) Age *M*= 22.74*, SD* = 7.31 Italy	To examine orthorexia nervosa symptoms and psychopathology in students	Maudsley Obsessive-Compulsive Questionnaire ORTO-15 Eating Attitudes Test – 26	Greater OC symptoms were associated with fewer orthorexia nervosa symptoms in females No relationship between OC symptoms and orthorexia nervosa was observed in males
Hayes et al. (2017)	Students *n* = 404 Females *n* ≈ 334 (82.7%) *M*= 20.71*, SD* = 4.36 United States of America	Examine correlates of orthorexia nervosa	Obsessive-Compulsive Inventory – Revised ORTO-15 Bratman Orthorexia Self-Test	A weak association was found between OC symptoms associated with greater orthorexia nervosa symptoms (ORTO-15) Those with elevated orthorexia symptoms had greater OC symptoms compared to those with not elevated orthorexia nervosa
Fox et al. (2018)	Picky eaters *n* = 13 Females *n* = 11 (84.6%) Age *M* = 36.75 England, United Kingdom	Qualitative study to explore the lived experience of picky/selective eating	Semi-structured interview	Preferred foods described as safe; unsafe foods described as a source of anxiety

Gezer & Yalvaç (2018)	University students *n* = 1754 Females *n* = 760 (43.3%) Age *M* = 21.3, *SD* = 2.3 Males *n* = 994 (56.7%) Age *M* = 22.2, *SD* = 2.6 Turkish Republic of Northern Cyprus	Examine eating behaviours and OC symptoms in students	Eating Attitudes Test – 40 Maudsley Obsessive-Compulsive Inventory	Positive, weak correlations observed between OC symptoms and eating disorder symptoms Those at risk of an eating disorder had significantly greater OC symptoms compared to those without such risk
Kim et al. (2018)	Females from general population *n* = 463, of which were identified as: Overweight females with binge-eating disorder *n* = 22 Age *M* = 22.68, *SD* = 2.96 Normal weight females with binge-eating disorder *n* = 29 Age *M* = 21.83, *SD* = 1.94 Korea	To explore determinants of binge-eating disorder in normal and overweight women	Obsessive-Compulsive Inventory – Revised Eating Disorder Examination Questionnaire Dutch Eating Behaviour Questionnaire	Normal weight females with binge-eating disorder had more OC symptoms than normal weight females without binge-eating disorder OC symptoms did not differ between overweight females and normal weight females with binge-eating disorder OC symptoms could predict binge-eating disorder in normal weight females, but not overweight females
Strahler et al. (2018)	General population *n* = 713 Females *n* = 569 (79.8%) Age *M*= 29.4, *SD* = 11.2	To examine whether orthorexia nervosa is of clinical relevance and can be distinguished from other mental health conditions	Yale-Brown Obsessive Compulsive Scale Dusseldorf Orthorexia Scale	Greater OC symptoms observed in the orthorexia nervosa group compared to the non-orthorexia nervosa group Compulsive behaviours, rather than obsessive symptoms, could predict orthorexia nervosa symptoms

	Germany			
Bóna et al. (2019)	Gym attendees *n* = 207 Females *n* = 140 (67.6%) Age *M*= 31.9*, SD* = 8.7 Hungary	To assess psychological correlates of orthorexia nervosa in gym goers	Maudsley Obsessive Compulsive Inventory Eating Disorders Inventory ORTO-11 (Hungarian translation)	OC symptoms were not associated with orthorexia nervosa; eating disorder symptoms were associated with orthorexia nervosa
Łucka et al. (2019)	Students *n* = 864 Females *n* = 599 Age *M*= 20.21*, SD* = 3.27 Males *n* = 265 Age *M*= 18.93*, SD* = 3.67 Poland	To determine whether orthorexia nervosa is a part of, or separate to, OCD and eating disorders	ORTO-15 Maudsley Obsessive Compulsive Inventory Eating Attitudes Test – 26	No difference observed in OC symptoms between those at risk or not at risk of orthorexia nervosa OC symptoms of checking were associated with orthorexia nervosa symptoms
Zickgraf et al. (2019)	General population *n* = 449 Females *n* ≈ 220 (49%) *M* = 33.6, *SD* = 9.5 United States of America	To examine similarities and differences between orthorexia nervosa and eating disorder symptoms, such as OC symptoms	Obsessive-Compulsive Inventory – Revised Nine-Item ARFID Screen Eating Habits Questionnaire Clinical Impairment Assessment Eating Attitudes Test – 26 (Severe restricting for thinness and bingeing and purging items)	OC symptoms were associated with eating disorder symptoms and orthorexia nervosa OC symptoms were only associated with the problems subscale of orthorexia nervosa when controlling for eating disorder symptoms, suggesting impairments associated with orthorexia nervosa may be similar to OCD, but not the eating behaviours themselves

Bartel et al. (2020)	General population and students *N* = 512 Females *n* = 423 (82.6%) Age *M*= 24.5 Canda	To explore the relationship between orthorexia nervosa, eating disorder symptoms and OC symptoms	Obsessive-Compulsive Inventory – Revised The Revised Bratman's Orthorexia Test ORTO-15 Eating Disorder Examination Questionnaire The Food Choice Questionnaire	OC symptoms correlated with orthorexia nervosa symptoms, eating disorder symptoms and food choices When controlling for eating disorder symptoms, the correlation between OC symptoms and orthorexia nervosa was reduced OC symptoms could predict orthorexia nervosa, but to a lesser extent than eating disorder symptoms
Brytek-Matera et al. (2020)	General population *n* = 230 Females *n* = 175 (76.1%) Age *M*= 26.52*, SD* = 7.65 Poland	To determine psychopathological profiles of Polish adults concerning eating disorders, orthorexia nervosa and OC symptoms	Dusseldorf Orthorexia Scale Obsessive-Compulsive Inventory – Revised The Three-Factor Eating Questionnaire Eating Disorder Inventory	Three groups identified: (1) low psychopathology (2) high OC features, moderate eating disorder features/perfectionism (3) high eating disorder features/perfectionism, moderate OC features Participants with greater OC features were more likely to be at risk of orthorexia nervosa compared to those with low psychopathologies. However, those with moderate OC symptoms and greater eating disorder symptoms were more likely to have orthorexia nervosa
Dąbal (2020)	University students *n* = 236, of which: High orthorexia nervosa risk group *n* = 64 Females *n* = 34 (53.1%)	Identify the relationship between orthorexia nervosa symptoms and psychopathological factors	ORTO-15 Obsessive-Compulsive Inventory – Revised	The relationship between OC symptoms and orthorexia nervosa approached significance OC symptoms were greater in the high orthorexia nervosa symptoms group

	Age *M* = 23.91, *SD* = 4.7 Low orthorexia nervosa risk group *n* = 172 Females *n* = 83 (48.3%) Age *M* = 24.97, *SD* = 4.56 Poland			compared to the low orthorexia nervosa symptoms group
Walker-Swanton et al. (2020)	Participants reporting health eating/weight loss as primary dietary goal *n* = 130 Females *n* = 121 (93.1%) *M*= 21.03, *SD* = 7.67 Australia	Examine perceived need for treatment for orthorexia nervosa	Obsessive-Compulsive Inventory – Revised Eating Disorder Examination Questionnaire – Short Version Eating habits questionnaire	OC symptoms significantly, positively correlated with eating disorder symptoms OC symptoms were associated with orthorexia nervosa, but not when controlling for eating disorder symptoms Those wanting treatment for orthorexia nervosa had greater OC symptoms than those not wanting treatment, but OC symptoms could not distinguish between those wanting or not wanting treatment
Zhou et al. (2020)	University students (total sample) *n* = 418 Females *n* = 219 (52.4%) Age *M* = 20.0, *SD* = 1.1 Males *n* = 199 (47.6%) Age *M* = 20.0 *SD* = 1.2 China	To examine correlates of orthorexia nervosa among Chinese university students	Obsessive-Compulsive Inventory – Revised Orthorexia Nervosa Scale	OC symptoms were positively associated with orthorexia nervosa symptoms Those with elevated orthorexia nervosa symptoms had greater OC symptoms compared to those with non-elevated orthorexia nervosa symptoms

Albertella et al. (2021)	General population *n* = 878 Females *n* = 466 (53.1%) Age *M* = 32.0, *SD* = 12.5 Australia, England, United States of America, Brazil	To examine the relationship between impulsive and compulsive traits and addictive behaviours during the COVID-19 lockdown in Australia	Obsessive-Compulsive Inventory – Revised Modified Yale Food Addiction Scale	An association between OC symptoms and food addiction was observed during lockdown
Barnhart et al. (2021)	Students *n* = 509 Females *n* = 390 (76.6%) Age *M* = 19.96, *SD* = 2.93 United States of America	To explore psychological wellbeing and picky/selective eating in students	The Short Obsessive-Compulsive Screener Eating Disorder Examination Questionnaire Binge Eating Scale Adult Picky Eating Questionnaire Inflexible Eating Questionnaire	OC symptoms correlated with selective eating, eating disorder symptoms, binge-eating, inflexible eating and social eating anxiety. The strongest correlation was between OC symptoms and selective/picky eating Inflexible eating and OC symptoms also predicted these eating behaviours
Novara et al. (2021)	University students with high orthorexia nervosa symptoms *n* = 43 Females *n* = 21 (48.8%) Age *M*= 21.44, *SD* = 2.02 University students with low orthorexia nervosa symptoms *n* = 259 Females *n* ≈ 152 (58.5%) Age *M*= 20.83, *SD* = 3.33	To consider whether orthorexia nervosa can be considered a distinct condition	Obsessive-Compulsive Inventory – Revised Eating Disorder Inventory – Third Edition Eating Habits Questionnaire	Greater OC symptoms observed in the high orthorexia symptom group, compared to the low symptom group Eating disorder symptoms were linked to orthorexia nervosa when OC symptoms were controlled

	Italy			
Vanzhula et al. (2021)	Mixed student and eating disorder sample Students *n* = 1,222 Females *n* = 617 (50.5%) *M* = 19.98 Eating disorders (sample 1) *n* = 168 Females *n* = 159 (94.6%) *M* = 26.27 Eating disorders (sample 2) *n* = 229 Females *n* = 217 (94.8%) *M* = 29.24 United States of America	To explore the relationship between OC symptoms, eating disorder symptoms and perfectionism	Obsessive-Compulsive Inventory – Revised Eating Disorders Examination Questionnaire-IV The Frost Multidimensional Perfectionism Scale	Perfectionism and obsessions link symptoms of OCD and eating disorders
Yakın et al. (2021a)	Students *n* = 921 Females *n* = 780 (84.6%) Age *M* = 20.72*, SD* = 2.63 France	To compare differences between those with OC symptoms, eating disorder symptoms and orthorexia nervosa symptoms	Obsessive-Compulsive Inventory – Revised Eating Habits Questionnaire Eating Disorder Inventory – Third Edition (Drive for Thinness and Bulimia subscales)	Participants grouped into: OC symptom group, orthorexia nervosa symptom group, eating disorder symptom group, low psychopathology group Compared to the low psychopathology group, the OC group had greater orthorexia nervosa symptoms, although these were lower than the eating disorder group and orthorexia nervosa group

				The orthorexia nervosa group had similarly low levels of OC symptoms to the low psychopathology group, compared to the OC group The OC group had greater eating disorder symptoms than the low psychopathology and orthorexia nervosa groups, but this was lower than the eating disorder group
Yakın et al. (2021b)	Female students *n* = 362 Age *M*= 23.43, *SD* = 4.33 France	To explore profiles of female French students in regard to definitions of healthy eating, and examine these profiles with psychopathological symptoms	Obsessive-Compulsive Inventory – Revised Eating Habits Questionnaire Eating Disorder Inventory – Third Edition (Drive for Thinness and Bulimia subscales)	OC symptoms were not associated with orthorexia nervosa symptoms. OC symptoms were associated with eating disorder symptoms
Brytek-Matera et al. (2022)	Polish students *n* = 286 Females *n* = 236 (82.5%) Age *M*= 22.33, *SD* = 2.38 Italian students *n* = 320 Females *n* = 255 (79.7%) Age *M* = 21.98, *SD* = 2.09 Italy and Poland	To examine the relationship between orthorexia symptoms and OC symptoms in students from Poland and Italy	Obsessive-Compulsive Inventory – Revised Eating Habits Questionnaire	OC symptoms were weakly, but positively, correlated with orthorexia symptoms in Polish and Italian samples Those with greater orthorexia nervosa symptoms expressed more OC symptoms
Hallit et al. (2022)	General population *n* = 487 Females *n* = 372 (76.4%) Age *M*= 28.38, *SD* = 13.26	To examine orthorexia nervosa and OC symptoms in the Lebanese population	The 12-item Obsession-Compulsion Inventory Dusseldorf Orthorexia Scale Eating Attitudes Test – 26	Greater OC symptoms were associated with orthorexia nervosa symptoms OC symptoms of washing were a unique predictor of orthorexia nervosa when controlling for eating disorder symptoms

	Lebanon			
Kinkel-Ram et al. (2022)	General population *n* = 358 Females *n* = 141 (39.4%) Age *M* = 35.3, *SD* = 9.93 United States of America	To explore whether there is a longitudinal and bi-directional relationship between OC symptoms and eating disorder symptoms	Yale-Brown Obsessive Compulsive Scale Eating Disorder Examination Questionnaire version 6.0 Eating Disorder Examination Questionnaire – Short Version	Eating disorder symptoms and OC symptoms have a bi-directional relationship over the course of 5 weeks. This was prominent for eating disorder symptoms and obsessions, rather than compulsions
Novara et al. (2022)	Dieters with high orthorexia symptoms *n* = 52 Females *n* = 28 (53.85%) Age *M*= 42.68, *SD* = 13.41 Dieters with low orthorexia symptoms *n* = 41 Females *n* = 24 (58.4%) Age *M* = 47.87, *SD* = 12.18 Non-dieters with high orthorexia nervosa symptoms *n* = 40 Females *n* = 20 (50%) Age *M*= 20.78, *SD* = 2.71 Italy	To examine the role of dieting in those with high and low orthorexia tendencies, and their relationship with psychopathologies	Obsessive-Compulsive Inventory – Revised Eating Habits Questionnaire-21	Levels of OC symptoms were similar across dieters, with or without orthorexia tendencies, and those with orthorexia nervosa that were not on a diet

Yang et al. (2022)	Female exercisers *n* = 295 Age *M* = 22.11, *SD* = 6.65 China	To examine personality traits and OC symptoms and their relationship with disordered eating among Chinese female exercisers	Obsessive-Compulsive Inventory – Revised SCOFF The Ten-Item Personality Inventory	OC symptoms were associated with eating disorder symptoms OC symptoms partially mediated the relationship between agreeableness, emotional stability and eating disorder symptoms, and fully mediated the relationship between conscientiousness and eating disorder symptoms
Yazkan & Uğurlu (2022)	Healthcare professionals *n* = 183 Females *n* = 129 (70.49%) Aged between 20-65 years Türkiye		Maudsley Obsessive Compulsive Inventory ORTO-15	OC symptoms were positively associated with orthorexia nervosa symptoms
Barnhart et al. (2023) ***Same participant sample as Barnhart et al. (2021)***	Students *n* = 509 Females *n* = 390 (76.6%) Age *M* = 34.70, *SD* = 10.50 United States of America	To explore the relationship between facets of picky/selective eating and psychological factors and quality of life	The Short Obsessive-Compulsive Screener Eating Disorder Examination Questionnaire Binge Eating Scale Adult Picky Eating Questionnaire	OC symptoms were associated with poorer food variety, meal disengagement, meal presentation and taste aversion Pickiness over meal presentation and eating disorder symptoms could also predict OC symptoms
Dolapoglu et al. (2023)	Medical students *n* = 142 Females *n* = 75 (52.8%) Age *M*= 22 Türkiye	To understand the relationship between orthorexia nervosa, eating disorders and OC symptoms	Maudsley Obsessive-Compulsive Inventory Eating Attitude Test Short Form ORTO-11	OC symptoms were not associated with orthorexia nervosa in medical students

Duradoni et al. (2023)	General population *n* = 587 Females n ≈ 506 (86%) Age *M*= 29.32*, SD* = 11.29 Italy	To examine orthorexia nervosa and OC symptom subtypes	Vancouver Obsessional Compulsive Inventory ORTO-15 Orthorexia Nervosa Inventory	All OC symptom subtypes were associated with orthorexia nervosa, with OC obsessions being the strongest correlate
Levin et al. (2023)	University students *n* = 333 Females *n* ≈ 249 (72%) Age *M* = 20.9*, SD* = 4.3 Canada	To explore the relationships between orthorexia nervosa and associated psychopathologies	Obsessive-Compulsive Inventory – Revised The Eating Habits Questionnaire Eating Disorder Examination Questionnaire	OC symptoms were correlated with orthorexia nervosa symptoms, but orthorexia nervosa symptoms shared a stronger relationship with eating disorder symptoms Those with orthorexia nervosa symptoms and eating disorder symptoms had elevated levels of OC symptoms, compared to those with less eating pathologies. Those with eating disorder symptoms had the highest OC symptoms
Fekih-Romdhane et al. (2024)	General population *n* = 977 Females *n* = 753 (77.1%) *M* = 21.94*, SD* = 3.14 Poland, Lebanon, Italy	Examine the relationship between eating disorder symptoms, perfectionism and OC symptoms	Obsessive-Compulsive Inventory – Revised The Obsessive Beliefs Questionnaire-44 Eating Attitudes Test – 26 The Multidimensional Perfectionism Scale	Greater OC symptoms were associated with more eating disorder symptoms OC symptoms mediated the relationship between perfectionism and eating disorder symptoms, but perfectionism still had a direct effect on eating disorder symptoms
Greville-Harris et al. (2024)	Students *n* = 507 Females *n* = 424 (83.6%) Age *M*= 22.23*, SD* = 8.7	To examine the influence of perfectionism in the relationship between OC symptoms and perfectionism	Obsessive-Compulsive Inventory – Revised Dusseldorf Orthorexia Scale (English version)	Perfectionism partially mediated the relationship between OC symptoms and orthorexia nervosa symptoms

	England, United Kingdom		Frost Multidimensional Perfectionism Scale-Brief	OC symptoms had a direct effect on orthorexia nervosa when controlling for perfectionism
Huynh et al. (2024)	Undergraduate students *n* = 190 Females *n* ≈ 152 (80%) Age *M*= 28.63, *SD* = 9.88 Australia	To examine whether perfectionism is implicated in the relationship between OC symptoms and orthorexia nervosa	Obsessive-Compulsive Inventory – Revised Obsessive Beliefs Questionnaire Eating Habits Questionnaire Clinical Perfectionism Questionnaire	OC symptoms could predict orthorexia nervosa symptoms Perfectionism moderated the relationship between OC symptoms and orthorexia nervosa symptoms
(Latif & Moulding, 2024)	General population *n* = 238 Females *n* = 161 (67.6%) Non-binary/gender diverse *n* = 24 (10.1%) Age *M* = 29.32, *SD* = 10.47 Australia	To explore the effect of emotion regulation and feared self in the relationship between OC symptoms and eating disorder symptoms	Obsessive-Compulsive Inventory – Revised Eating Disorder Examination Questionnaire Fear of Self – Multidimensional Version Difficulties in Emotion Regulation Scale Short Form	OC symptoms were not a significant predictor of eating disorder symptoms when controlling for other factors, including emotion regulation, depression, anxiety and gender
(Rossi et al., 2024)	General population *n* = 1328 Females *n* = 976 (73.5%) Age *M*= 28.70, *SD* = 5.843 Italy	To examine whether worries about food and food preoccupation mediated the relationship between OC symptoms, eating disorder symptoms and orthorexia nervosa	Obsessive-compulsive subscale of the Symptom Checklist-90 Revised Eating Attitudes Test – 26 ORTO-15	OC symptoms correlated with eating disorder symptoms and orthorexia nervosa symptoms Worries about food/food preoccupation mediated the relationship between OC symptoms and orthorexia nervosa symptoms OC symptoms had a direct effect on orthorexia nervosa when controlling for worries about food

(Zohar et al., 2025)	Students *n* = 772 Females *n* = 636 (82.4%) Age *M*= 29.40*, SD* = 8.50 Italy	To assess the relationship between adult picky eating, childhood picky eating and other variables including OC symptoms	Obsessive-Compulsive Inventory – Revised Adult Picky Eating Questionnaire	Adult picky eating was positively associated with OC symptoms Childhood picky eating was associated with OC symptoms in adulthood

Note: ≈ gender *n* based on percentages provided by the authors

2.3. Non-clinical atypical eating behaviours and obsessive-compulsive symptoms

2.3.1. Food avoidance behaviours

Food avoidance, specifically selective eating, has been observed in adults of the general population who display high levels of OC symptoms. This has been evidenced through correlational analyses, which show that individuals who report higher levels of OC symptoms express more selective eating behaviours (Barnhart et al., 2021; Zohar et al., 2025). Group comparisons further indicate that adult selective eaters display significantly more OC symptoms than non-selective eaters (Kauer et al., 2015; Zickgraf et al., 2016). Those with OC symptoms have also been found to have distinct preferences for meal presentation, indicating that food selectiveness extends to visual aspects of meals (Barnhart et al., 2023).

A qualitative study also observed patterns of OC symptoms among adult selective eaters (Fox et al., 2018). Here, participants noted that they viewed foods as 'safe' (i.e., foods deemed less dangerous) or 'unsafe', which would then lead to symptoms of anxiety and subsequently avoidance. These findings suggested that selective eaters may experience hyperfocus around the safety of certain foods, which may contribute to compulsive food avoidance.

2.3.2. Food approach behaviours

Food approach behaviours have also been associated with OC symptoms. For example, Barnhart and colleagues (2021) found higher levels of binge-eating behaviours to be associated with greater levels of OC symptoms. In a separate study, greater levels of food addiction were associated with increased levels of OC symptoms during the COVID-19 lockdown period (Albertella et al., 2021). Increases in food addiction were also associated with greater compulsivity, which is considered a risk factor for OCD. However, as this association was observed during novel circumstances, further research is needed to examine whether the relationship between food addictions and OC symptoms holds during more stable periods.

2.3.3. Orthorexia nervosa

Some studies have suggested that adults of the general population who display increased levels of orthorexia nervosa symptoms also experience more severe OC symptoms (Brytek-Matera et al., 2022; Bundros et al., 2016; Hayes et al., 2017; Levin et al., 2023; Yazkan & Uğurlu, 2022; Zhou et al., 2020). More specifically, Łucka et al. (2019) observed that OC checking symptoms were associated with increased orthorexia nervosa behaviours, whereas other OC symptoms, including cleaning or doubts, were not associated with orthorexia nervosa.

OC symptoms were also found to predict greater levels of orthorexia nervosa symptoms (Huynh et al., 2024). Hallit and colleagues (2022) observed a unique predictive effect of OC washing symptoms on orthorexia nervosa, when controlling for other factors such as eating disorder symptoms. Another study by Strahler and colleagues (2018) found that compulsive symptoms, rather than obsessions, could predict orthorexia nervosa symptoms. Hence, it appears there is a relationship between orthorexia nervosa and OC symptoms, however there are mixed findings regarding which aspects of OC symptoms are related to this type of atypical eating behaviour.

Further evidence for a link between OC symptoms and orthorexia nervosa is provided by between-groups studies. Brytek-Matera and colleagues (2020) and Yakın and colleagues (2021a) found that participants with OC symptoms, compared to those without OC symptoms, were more likely to exhibit orthorexia nervosa symptoms. Similarly, individuals with severe symptoms of orthorexia nervosa displayed greater OC symptoms than those with less severe orthorexia nervosa symptoms (Asil & Sürücüoğlu, 2015; Brytek-Matera et al., 2022; Dąbal, 2020; Hayes et al., 2017; Novara et al., 2021; Strahler et al., 2018; Zhou et al., 2020). Furthermore, a study by Walker-Swanton and colleagues (2020) observed that those wanting treatment for orthorexia nervosa had greater OC symptoms than those with fewer orthorexia nervosa symptoms, which may reflect the severity of these atypical eating behaviours.

However, the relationship between OC symptoms and orthorexia nervosa has been disputed. Some studies posit that, whilst OC symptoms seem to be associated with orthorexia nervosa, this relationship is reduced or even negated when considering eating disorder symptoms (Bartel et al., 2020; Novara et al., 2021; Rossi et al., 2024; Walker-Swanton et al., 2020; Zickgraf, Ellis, et al., 2019). Therefore, this suggests that the shared variation between OC symptoms and eating disorder symptoms may underlie the relationship between OC symptoms and orthorexia nervosa. Moreover, perfectionism, a core characteristic of OCD and eating disorders, has also been implicated in the relationship between OC symptoms and orthorexia nervosa as a mediator and moderator (Greville-Harris et al., 2024; Huynh et al., 2024). However, some studies which have controlled for these alternative variables, such as perfectionism and eating disorder symptoms, have continued to observe a relationship between OC symptoms and orthorexia nervosa, highlighting the complexity of this relationship (Greville-Harris et al., 2024; Hallit et al., 2022; Rossi et al., 2024).

In contrast, some studies have failed to find any relationship between OC symptoms and orthorexia nervosa (Asil & Sürücüoğlu, 2015; Bóna et al., 2019; Dąbal, 2020; Dolapoglu et al., 2023; Yakın et al., 2021b). An earlier study by Brytek-Matera and colleagues (2017) observed no relationship between OC symptoms and orthorexia nervosa in males, and a negative relationship in females, where increased OC symptoms were associated with fewer orthorexia nervosa symptoms. Moreover, OC symptoms were observed to be similar between those with and without orthorexia nervosa tendencies (Łucka et al. 2019; Novara et al., 2022), and to participants with low levels of psychopathology (Novara et al., 2022; Yakın et al., 2021a;). These results suggest that OC symptoms may not be elevated in those with orthorexia nervosa compared to other groups.

Discussion

Overall, the scoping review highlighted that adults with OCD appear to be at greater risk of developing eating disorders, particularly those related to weight and shape concerns (i.e., anorexia nervosa and bulimia nervosa) compared to the general population (e.g., Bang et al., 2020; Garcia et al., 2020). Far fewer studies were found to have investigated non-clinical atypical eating behaviours in OCD participants, despite evidence for food approach behaviours and orthorexia nervosa to present in some adults with OCD. Among the general population, a relationship between OC symptoms and atypical eating was also observed, whereby engagement in atypical eating behaviours was found to be associated with elevated levels of OC symptoms, particularly in the presence of emotion and mood difficulties.

Whilst research has predominantly focused on eating disorders associated with dieting (i.e., anorexia nervosa and bulimia nervosa), there is evidence to suggest that two disorders at opposite end of the restrictive food intake spectrum are associated with OCD. Both binge-eating disorder, characterised by uncontrollable episodes of eating, and ARFID, characterised by extreme food avoidance, have been linked to OCD (Kim et al., 2018; Williams et al., 2017; Zickgraf et al., 2016). In fact, research has highlighted that as many as 4-20% of ARFID patients may experience comorbid OCD or OC symptoms – rates that are not dissimilar to those observed in other eating disorders, such as anorexia nervosa (Bryson et al., 2018; Fisher et al., 2014; Zickgraf et al., 2016). Therefore, OCD may be related to a range of pathological eating disorder patterns, including ARFID. However, there were no studies to date which had specifically explored the prevalence of ARFID in OCD.

Despite those with OCD experiencing more intense OC symptoms during daily routines, including mealtimes (Brierley et al., 2021), very few studies have examined the relationship between OC symptoms and non-clinical atypical eating behaviours, such as selective eating or food neophobia (Rai et al., 2022; Zickgraf et al., 2016). Given that these non-clinical atypical eating behaviours have been considered a risk factor for developing an eating disorder in later life, there is a need to better understand and identify these eating behaviours earlier (Herle et al., 2020).

Most studies to date have taken a broad approach to exploring OC symptoms and atypical eating behaviours. However, OCD and its symptoms are complex and have varied presentations; for example, one individual with OCD may experience obsessions and compulsions regarding contamination, whereas another may experience symptoms involving symmetry, orderliness, or religion (Bennett et al., 2013; Černelič-Bizjak & Guiné, 2021; Eddy et al., 2015; Sobik et al., 2005). Although limited, there was some evidence to suggest that specific OC symptoms were associated with certain atypical eating behaviours. For example, OC checking was linked to orthorexia nervosa, dietary restraint and bingeing, whereas OC contamination was associated with dietary restraint (Pollack & Forbush, 2013; Poyraz et al., 2015), and OC hoarding and obsessing were associated with concerns about being seen eating in public (Vanzhula et al., 2021). Not all individuals with OCD or OC symptoms may display atypical eating behaviours, hence it would be of interest to further explore whether subsets of those with OCD are more at risk of specific eating concerns.

It is possible that shared transdiagnostic characteristics and features of individuals with OCD and eating disorders may underlie the expression of eating disorder symptoms in OCD. The Transdiagnostic Model, proposed by Fairburn and colleagues (2003), posits that certain cognitive mechanisms, such as perfectionism, mood intolerance and low self-esteem, and interpersonal difficulties are core to the presentation and maintenance of eating disorders (Fairburn et al., 2003). These cognitive mechanisms are not unique to those with eating disorders and have also been observed as characteristics of the OCD population (Calkins et al., 2013; Fairburn et al., 2003; Maia et al., 2009; Williams & Levinson, 2021). Some of these transdiagnostic factors, namely perfectionism and difficulties with emotion dysregulation, were suggested to account for the association between OC symptoms and atypical eating behaviours in both the OCD and general population (Kaczkurkin et al., 2021; Latif & Moulding, 2024; Pollack & Forbush, 2013; Yang et al., 2022). Therefore, it is important to consider the role of perfectionism and emotion regulation in the relationship between atypical eating behaviours and OCD or OC symptoms, along with other factors such as sensory sensitivity and cognitive rigidity, as proposed by studies in both neurotypical and neurodiverse populations (Farrow & Coulthard, 2012; Zickgraf et al., 2022).

In summary, the literature suggests that OC symptoms pose a risk for atypical eating behaviours in the OCD population, as well as the general population. Given that problematic eating behaviours, such as food selectivity and eating disorders, pose significant psychological, functional and social limitations (Fildes et al., 2015; Galloway et al., 2005; Wildes et al., 2012), there is a need to acknowledge its prevalence among those with OCD and those displaying high levels of OC symptoms. Moreover, it would also be important to understand the risk factors that may underlie atypical eating behaviours in this population.

Section I:
Obsessive-compulsive symptoms and atypical eating behaviours in the general population

Chapter 3: Exploring non-clinical atypical eating behaviours and obsessive-compulsive symptoms in a non-clinical population

Overview

The scoping review presented in the previous chapter explored the relationship between OCD, OC symptoms and atypical eating behaviours, encompassing both non-clinical atypical eating behaviours (i.e., less severe) and eating disorders. The review concluded that a relationship appeared to exist between OCD, high levels of OC symptoms and non-clinical atypical eating behaviours, particularly food avoidance. However, the scoping review highlighted that research of this nature was scarce. Given the paucity of existing research, the present study aimed to explore the relationship between non-clinical atypical eating behaviours and OC symptoms in adults from the general population.

Introduction

It is estimated that up to 20% of adults in the general population experience OC symptoms (Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Fullana et al., 2009, 2010; Grabe et al., 2000; Valleni-basile et al., 1994). However, not all individuals with OC symptoms will meet the threshold for an OCD diagnosis or clinical intervention. Despite this, OC symptoms are still associated with adverse consequences, such as the risk of co-occurring mental health disorders, psychosocial impairment and increased levels of negative emotion (Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Fineberg, Hengartner, Bergbaum, Gale, Rössler, et al., 2013; Spinella, 2005).

Some research has indicated that adults of the general population who experience OC symptoms may also engage in non-clinical atypical eating behaviours, such as food avoidance and food approach behaviours. Greater levels of selective eating, a type of food avoidance commonly known as food fussiness, have been reported by those who experience high levels of OC symptoms; this has been evidenced through correlational research, as well as a study which compared OC symptoms between selective and non-selective eaters (Barnhart et al., 2021; Kauer et al., 2015; Wildes et al., 2012; Zickgraf, Ellis, et al., 2019). A qualitative study also identified themes of OC symptoms among selective eaters, whereby thoughts regarding the safety of foods led to the compulsive avoidance of such foods (Fox et al., 2018).

Fewer studies have explored food approach behaviours, a term which encapsulates all movements towards foods, but there is preliminary evidence to suggest that these eating behaviours are also associated with OC symptoms. For example, Barnhart and colleagues (2021) observed that those with greater OC symptoms were more likely to engage in bingeing behaviours. Moreover, increased levels of food addiction were associated with higher levels of OC symptoms during the COVID lockdown periods (Albertella et al., 2021).

A more comprehensive understanding of the association between OC symptoms and non-clinical atypical eating behaviours is needed for several reasons. Firstly, whilst non-clinical atypical eating behaviours do not typically warrant clinical intervention, they are associated with adverse consequences for physical health and psychological wellbeing. For example, many studies have shown that food approach behaviours, such as emotional eating, are associated with increased cardiovascular risk, higher BMI status and a preference for unhealthier foods (Benbaibeche et al., 2023; Bennett et al., 2013;

Lopez-Cepero et al., 2018; Puchkova-Sistac et al., 2023; Van Strien et al., 2009). Non-clinical atypical eating behaviours are also associated with complex psychological difficulties, such as poorer emotion regulation and overall psychological wellbeing, as well as greater levels of eating disorder symptoms (Braden et al., 2018; Galloway et al., 2005; Zickgraf & Schepps, 2016).

Moreover, eating represents a core part of day-to-day functioning, and eating a healthy diet is important to reduce the risk of chronic disease and morbidity (WHO, 2003). However, eating well or healthily can be a challenge for those experiencing mental health difficulties (Graham et al., 2013; Verhaeghe et al., 2013). Furthermore, individuals experiencing stress, anxiety or negative emotions – all of which are observed among those with OC symptoms – may engage in non-clinical atypical eating behaviours which are associated with negative effects on dietary intake, physical health and psychological wellbeing (Braden et al., 2018; Groesz et al., 2012; Macht & Simons, 2000).

It is also important to note that both OC symptoms and non-clinical atypical eating behaviours appear to act as precursors to more serious symptoms that may warrant a diagnosis (Black & Gaffney, 2008; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Pereboom et al., 2023; Thompson et al., 2020). For example, in a longitudinal study of children, Herle and colleagues (2020) found that overeating in childhood was associated with binge-eating disorder in later life, and that selective eating and undereating were associated with an increased likelihood of developing anorexia nervosa. Similar findings were observed in a retrospective study whereby emotional overeating, food responsiveness and enjoyment of food before the age of 10 could predict binge eating behaviours in adolescence (Derks et al., 2022). Although studies have not explored this phenomenon in adults, earlier identification of persistent non-clinical atypical eating behaviours could reduce the risk of developing more severe eating concerns.

The present study proposed an observational, cross-sectional approach to explore the relationship between OC symptom severity and non-clinical atypical eating behaviours in a sample of adults from general population. Non-clinical atypical eating behaviours included food avoidance (e.g., selective eating and food neophobia) and food approach behaviours (e.g., emotional overeating and food responsivity). As the present literature base is limited by a lack of research, the hypotheses for the study remained exploratory.

Methods

Ethical approval

Ethical approval for the study was obtained from the University of Hertfordshire Ethics Committee (ethics protocol number: LMS/PGR/UH/04696, 29/09/2021) and the research was performed in accordance with the Declaration of Helsinki (Appendix 1). The study protocol involved participants completing a series of online self-report questionnaires to assess OC symptoms and non-clinical atypical eating behaviours.

Participants

A volunteer sample of eighty-five adults from the general population (males n=17), aged between 20 and 66 years of age (M= 40.79 years, SD=12.70), participated in the study. Participants were recruited

via social media (e.g., X, Facebook and Instagram) and the University of Hertfordshire's online participation system over a period of four months. The inclusion criteria required participants to be aged over 18 years and be able to comprehend written English. Those with a diagnosis of OCD or an eating disorder were advised against participating due to the nature of the questionnaires but were not excluded. Participants who were students were provided with course credits for their participation.

Procedure

Participants were directed to the online study using the link from the study flyer and/or online participation system advert (study advert; Appendix 14). Prior to accessing the study measures, participants had to read through the information sheet (Appendix 15) and provide informed consent for their participation (Appendix 16). Thereafter, the questionnaires were presented in the same order to each of the participants and took approximately 30 minutes to complete. Upon completion of the study, participants were thanked for their time and provided with a debrief sheet (Appendix 17) which detailed further information about the study, and guidance on how to seek support if the questionnaires had raised any issues or concerns. Identifiable data was not collected, and all participants were identified using a self-reported anonymity code.

Measures

Demographics

Basic demographic information was collected at the start of the study. Participants were asked to report their age, gender, employment or student status, ethnicity or ancestral background, and whether they had ever been diagnosed with a mental health condition during their lifetime.

Body-Mass Index

Participants were asked to report their height and weight to calculate their body mass index (BMI). Height and weight measurements were converted to metres (m) and kilograms (kg), respectively, and BMI was calculated using the following formula: BMI = kg/m^2.

The Obsessive-Compulsive Inventory – Revised

OC symptoms were assessed using The Obsessive-Compulsive Inventory – Revised (OCI-R; Foa et al., 2002), which is an 18 item self-report scale. Items of the scale are categorised into six subscales reflecting OC symptoms: washing, checking, ordering, obsessing, hoarding and neutralising. Example items include *'I check things more often than necessary'* (checking subscale) and '*I wash my hands more often and longer than necessary'* (washing subscale). Participants are asked to report how much distress each item has caused them over the last month on a 5-point scale, ranging between '*0 – Not at all'* and '*5 – Extremely'.* Item scores are summed to provide a total OCI-R score, giving an overall measure of OC symptom severity, while the items for each subscale are totalled to indicate whether the individual presents with a particular set of OC symptoms. A higher score denotes more severe OC symptoms; total OCI-R scores can range between 0 and 72, with sub-scores ranging from 0 to 12. It is

suggested that those who have a total score of 21 or higher may present with OCD. In OCD patients and those with other anxiety disorders, the OCI-R had an internal reliability of α=.88 and α=.89, respectively (Abramowitz & Deacon, 2006). In the present study, the OCI-R subscales of washing (α=.83), obsessing (α=.86), ordering (α=.89) and neutralising (α=.81) demonstrated good internal reliability, and checking (α=.78) had acceptable internal reliability. For the hoarding subscale, Cronbach's alpha coefficients suggested questionable internal reliability (α=.68). Total OCI-R scores were used in the study analysis.

The Food Neophobia Scale

The Food Neophobia Scale (FNS; Pliner & Hobden, 1992) is a ten-item questionnaire used to assess the avoidance of novel foods. Items include *'I don't trust new foods'* and *'I will eat almost anything'* (reversed item). Each of the statements are responded to on a 7-point Likert scale ranging between *'1 – disagree strongly'* to '*7 – agree strongly'*. Items are summed, and reversed where appropriate, to provide a total score, with higher scores indicating greater food neophobic thoughts and behaviours. Development of the tool and the present study indicated good internal reliability, with Cronbach's alphas of α = .88, and α = .865, respectively (Pliner & Hobden, 1992).

The Adult Picky Eating Questionnaire

The Adult Picky Eating Questionnaire (APEQ; Ellis et al., 2017) assesses selective eating behaviours across four subscales: meal presentation, food variety, meal disengagement and taste aversion. Participants respond to a series of items on a 5-point Likert scale ranging between *'1 – Never'* to *'5 – Always'*. Example items include *'I do not like trying new foods'* (food variety) and *'I eat foods in a specific sequence'* (meal presentation). Subscale scores are summed and then averaged; total selective eating scores are the average of all items. Greater scores indicate a stronger presence of selective eating. In the current study, the subscales of meal presentation and meal disengagement had questionable reliability (α=.664 and α=.688, respectively), food variety had poor internal reliability (α=.556), and the taste aversion subscale had unacceptable reliability (α=.083). The total APEQ score was used in the present study.

The Adult Eating Behaviour Questionnaire

The Adult Eating Behaviour Questionnaire (AEBQ; Hunot et al., 2016) is a self-report questionnaire designed to measure appetitive traits. The scale contains a total of 35 items, which assess food approach and food avoidance behaviours. Food approach (AEBQ-approach) is measured across four subscales: food responsiveness, emotional overeating, enjoyment of food and hunger. Example items for food approach behaviours include *'I eat more when I'm angry'* (emotional overeating) and *'I am always thinking about food'* (food responsivity). Food avoidance (AEBQ-avoidance) is assessed through a further four subscales: satiety responsiveness, emotional undereating, food fussiness/selective eating and slowness in eating. Food avoidance items include *'I eat less when I'm anxious'* (emotional undereating) and *'I cannot eat a meal if I have had a snack just before'* (satiety responsivity). Scores for each subscale are obtained by averaging each item score, with higher scores corresponding to greater displays of each eating behaviour. Development of the scale demonstrated good internal reliability (Cronbach's a = .73-.91; (Hunot et al., 2016). In the present study, Cronbach's alpha coefficients ranged

between α=.580 and α=.927. Total scores for food approach behaviours and food avoidance behaviours were used in the analyses.

Statistical analysis

All analyses were conducted using SPSS IBM Version 29 (SPSS Inc., Chicago, IL, USA). First, the relationship between the study variables were examined through a series of two-tailed Pearson's correlations. The correlational analyses included the OCI-R total scores, non-clinical atypical eating behaviours (FNS, APEQ and AEBQ), age and BMI. Following this, a series of hierarchal regressions were carried out to explore whether study variables could predict each type of atypical eating behaviour. In the first step, age, gender and mental health status (the presence or absence of a mental health condition) were examined as predictors of the atypical eating behaviour; in the second step, OC symptom severity (OCI-R total) was added to the multiple regression model.

The categorical variables of gender and mental health status were transformed into dummy variables for the purpose of the multiple regression analyses. Females were coded as '1' and males were coded as '0'. The presence of a mental health condition was coded as '1' and the absence of a mental health condition was coded as '0'. Positive beta coefficients would suggest that being female or having a mental health condition would increase the predictive effect on the atypical eating behaviour, compared to being male or having a mental health condition, respectively.

Results

Sample statistics

Data for the study was screened prior to analysis. Incomplete participant data and data provided by participants over the age of 65 were removed (n=2). The decision to remove data provided by participants over 65 years of age was to limit the potential confounding effect of age on eating behaviours. Data from 83 adults (females n=66), aged between 20 and 65 (M=40.18, SD=12.22), remained for the study analysis. BMI was only calculated for 56 participants due to missing and/or incomplete data.

Of the 83 participants, 50.6% (n=42) were in full time employment, 16.9% (n=14) were in part-time employment and 4.8% (n=4) reported being unemployed. A further 2.4% (n=2) were full-time students and 6% (n=5) preferred not to say. Occupation data was missing for 19.3% (n=16) of the participants. Participants were from a range of ethnic and ancestral backgrounds (Asian n=30, White n=21, Black African or Caribbean n=2, mixed background n=11, other backgrounds n=19). Twenty-eight percent (n=23) reported being diagnosed with a mental health condition (depression and anxiety-related conditions, n=21; OCD, n=1; personality disorder, n=1; memory impairment, n=1). Mean and standard deviations for BMI and the standardised measures exploring OC symptoms and atypical eating behaviours are presented in Table 3.1.

Table 3.1.

Descriptive statistics of BMI, OC symptoms and non-clinical atypical eating behaviours

Study variable	Mean (SD)
BMI	27.53 (6.94)
OCI-R total	17.46 (12.65)
Washing	*1.94 (2.47)*
Obsessing	*3.40 (3.07)*
Hoarding	*3.60 (2.74)*
Ordering	*3.96 (2.93)*
Checking	*3.12 (2.86)*
Neutralising	*1.43 (2.37)*
FNS	29.98 (11.73)
APEQ	1.99 (.53)
AEBQ	
Food Avoidance	10.38 (2.11)
Food Approach	13.34 (2.43)

Note: OCI-R = Obsessive-compulsive Inventory – Revised; FNS = The Food Neophobia Scale; APEQ = Adult Picky Eating Questionnaire; AEBQ = Adult Eating Behaviour Questionnaire

Correlations between study variables

OC symptoms and non-clinical atypical eating behaviours

A series of Pearson's correlations were conducted to establish whether there were significant relationships between OC symptoms (OCI-R total), age, BMI and non-clinical atypical eating behaviours (FNS, APEQ, AEBQ-avoidance and AEBQ-approach). All correlations between the study variables and atypical eating behaviours are displayed in Table 3.2.

A weak, positive relationship was observed between age and the FNS, suggesting older participants were more likely to express food neophobia. BMI was not associated with any study variable.

OCI-R scores were significantly and positively correlated with the APEQ and AEBQ-approach; these correlation coefficients were moderate in strength and indicated that those with greater levels of OC symptoms were more likely to be selective eaters and engage in food approach behaviours, respectively. Neither age, BMI, FNS nor AEBQ-avoidance shared a significant relationship with the OCI-R.

Table 3.2.
Correlations between study variables and non-clinical atypical eating behaviours

	1.	2.	3.	4.	5.	6.	7.
1. OCI-R total	1						
2. FNS	.194	1					
3. APEQ	.590**	.510**	1				
4. AEBQ-avoidance	.006	.313**	.163	1			
5. AEBQ-approach	.455**	-.030	.258*	-.252*	1		
6. Age	.032	.285**	.011	-.108	-.139	1	
7. BMI	-.147	.210	-.039	.057	.003	.168	1

Note: *$p \leq .05$; **$p \leq .01$
OCI-R = Obsessive-compulsive Inventory – Revised; FNS= The Food Neophobia Scale; APEQ = Adult Picky Eating Questionnaire; AEBQ-avoidance = Adult Eating Behaviour Questionnaire food avoidance total; AEBQ-approach = Adult Eating Behaviour Questionnaire food approach total.

Study variables as predictors of atypical eating behaviours

A series of hierarchical regressions were computed to examine the predictive effect of demographic variables and total OCI-R scores on non-clinical atypical eating behaviours. For each set of hierarchical regressions, the first set of predictors included demographic variables of age, gender and mental health status (Model 1). In the second step, OCI-R total scores were added to the model (Model 2). Tables 3.4-3.7 present a summary of the hierarchical regressions.

Prior to conducting the hierarchical regressions, assumption testing was carried out. First, the dependent variables were examined for normality of distribution using the Shapiro-Wilk Test. The following measures had a normal distribution: AEBQ-avoidance (W = .975, p = .109); AEBQ-approach (W = .982, p = .313); APEQ (W = .977, p = .147). The FNS was not normally distributed; however, this finding was not unexpected as the measure is used to assess atypical eating behaviours.

Tolerance values were above .9 and variance inflation factor (VIF) scores remained below 1.1, indicating that collinearity was not present between the predictor variables; table 3.3 provides full statistics for tolerance values and VIF scores. In most cases, the dependent variables were correlated with the OCI-R total, but not with age, gender or mental health status. Inspection of Probability-Plots suggested the residuals were normally distributed, and individual cases did not appear to affect the models, with Cook's distance scores falling below 1. Standard residuals remained within an acceptable range (-3.2 to 3.3).

Table 3.3.
Tolerance and VIF values for predictors across the hierarchical regression models

Model	Predictor	Tolerance	VIF
1	Age	.992	1.009
	Gender	.984	1.016
	Mental health status	.983	1.018
2	Age	.991	1.009
	Gender	.977	1.024
	Mental health status	.916	1.092
	OCI-R total	.929	1.077

Note: Mental health status – the presence or absence of a mental health disorder; OCI-R total = Obsessive-compulsive Inventory – Revised

Study variables as predictors of the Food Neophobia Scale

The first set of hierarchical regressions examined whether the two models could predict FNS scores. Model 1 fell short of significance (R^2 = .091, adjusted R^2 = .056, $F(3, 79) = 2.621$, p = .056), however Model 2 could significantly predict FNS scores, accounting for 13.4% of the variance (R^2 = .134, adjusted R^2 = .090, $F(4, 78) = 3.028$, p = .022). In Model 2, OCI-R total scores were a significant predictor of FNS scores, with one standard deviation increase in OCI-R scores resulting in a .2 standard deviation increase in FNS scores (β = .20, p = .05). Age was also a significant predictor, with one standard deviation increase in age leading to a .28 standard deviation increase in FNS scores (β = .28, p = .010). Model 2 accounted for more variance in FNS scores compared to Model 1 (R^2 change = .044, *F-change* (1, 78) = 3.955, p = .050). These findings indicated that older participants and those with greater levels of OC symptoms were more likely to express food neophobia; OC symptoms and older age combined accounted for more variance than age independently. See Table 3.4 for the statistical values.

Table 3.4.
Summary of hierarchical regression analysis for study variables predicting the Food Neophobia Scale

	Model 1				**Model 2**			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	17.39 ***	.00	3.58	**.001**	14.01 **	-.00	2.77	**.007**
Age	.27 *	.28	2.62	**.010**	.27 *	.28	2.63	**.010**
Gender	2.58	.09	.83	.411	3.11	.11	1.01	.316
Mental health status	-1.27	-.05	-.45	.655	-2.75	-.11	-.96	.341
OCI-R total					.20*	.22	1.99	**.050**
R^2 / R^2 adjusted	.091 / .056				.134 / .090			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Mental health status = presence or absence of a mental health disorder.

Study variables as predictors of the Adult Picky Eating Questionnaire

For APEQ scores, Model 1 was not a significant predictor (R^2 = .028, adjusted R^2 = -.009, $F(3, 79)$ = .746, p = .528), however Model 2 was significant, accounting for 35.2% of the variance in APEQ scores (R^2 = .352, adjusted R^2 = .319, $F(4, 78) = 10.603$, $p < .001$). In Model 2, OCI-R total scores were a significant predictor, where a one standard deviation increase in OCI-R scores led to a .59 standard deviation increase in APEQ scores (β = .59, p = < .001). The addition of OCI-R scores in Model 2 significantly accounted for more variance in APEQ scores compared to Model 1 (R^2 change = .325, *F-change*(1, 78) = 39.091, $p < .001$). In summary, those with higher levels of OC symptoms were more likely to be selective eaters; age, gender and mental health status were not associated with selective eating. Statistical values are presented in Table 3.5.

Table 3.5.
Summary of hierarchical regression analysis for study variables predicting the Adult Picky Eating Questionnaire

	Model 1				Model 2			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	2.04 ***	.00	9.01	**<.001**	1.63 ***	.00	8.24	**<.001**
Age	.00	.01	0.07	.947	-.00	-.00	-.04	.972
Gender	-.14	0.11	-0.95	.345	-.07	-.06	-.62	.540
Mental health status	.16	.14	1.25	.215	-.02	-.02	-.16	.875
OCI-R total					.02 ***	.59	6.25	**<.001**
R^2 / R^2 adjusted		.028 / -.009				.352 / .319		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Mental health status = presence or absence of a mental health disorder.

Study variables as predictors of the Adult Eating Behaviour Questionnaire - Avoidance

Concerning AEBQ-avoidance scores, neither Model 1 (R^2 = .080, adjusted R^2 = .045, $F(3, 79) = 2.289$, p = .085) nor Model 2 (R^2 = .084, adjusted R^2 = .037, $F(4, 78) = 1.777$, p = .142) significantly predicted AEBQ-avoidance scores. These findings suggested that none of the study variables were associated with food avoidance. Although female gender appeared to predict food avoidance, the overall models were insignificant, negating the effect of gender on food avoidance. Statistical values can be found in Table 3.6.

Table 3.6.
Summary of hierarchical regression analysis for study variables predicting the Adult Eating Behaviour Questionnaire – Avoidance

	Model 1				Model 2			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	10.36***	.00	11.79	**<.001**	10.19	.00	10.87	**<.001**
Age	-.02	-.11	-1.05	.297	-.02	-.11	-.105	.295
Gender	1.24*	.24	2.20	**.031**	1.27*	.24	2.23	**.029**
Mental health status	-.64	-.14	-1.25	.213	-.72	-.15	-1.35	.181
OCI-R total					.01	.06	.55	.585
R^2 / R^2 adjusted		.080 / .045				.084 / .037		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Mental health status = presence or absence of a mental health disorder.

Study variables as predictors of the Adult Eating Behaviour Questionnaire - Approach

With regards to AEBQ-approach scores, Model 1 could not significantly predict the scores (R^2 = .060, adjusted R^2 = .025, $F(3, 79) = 1.695$, $p = .175$), however Model 2 was significant, accounting for 24.8% of the variance in AEBQ-approach scores (R^2 = .248, adjusted R^2 = .209, $F(4, 78) = 6.419$, $p < .001$). In Model 2, OCI-R total scores were a significant predictor, where a one standard deviation increase in OCI-R scores led to a .45 standard deviation increase in AEBQ-approach scores ($\beta = .45$, $p = < .001$). The addition of OCI-R scores in Model 2 significantly accounted for more variance in AEBQ-approach scores compared to Model 1 (R^2 change = .187, *F-change*(1, 78) = 19.407, $p < .001$). In summary, those with greater OC symptoms were more likely to engage in food approach behaviours; other study variables were not associated with food approach behaviours. Refer to Table 3.7 for a summary of these hierarchical regressions.

Table 3.7.
Summary of hierarchical regression analysis for study variables predicting the Adult Eating Behaviour Questionnaire – Approach

	Model 1				Model 2			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	14.00***	.00	13.67	**<.001**	12.55***	.00	12.83	**<.001**
Age	-.03	-.16	-1.43	.157	-.03	-.16	-1.67	.099
Gender	.40	.07	.60	.548	.62	.10	1.05	.298
Mental health status	1.00	.19	1.68	.096	.36	.07	.66	.512
OCI-R total					.09***	.45	4.41	**<.001**
R^2 / R^2 adjusted		.060 / .025				.248 / .209		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Mental health status = presence or absence of a mental health disorder.

Hierarchical regressions summary

Overall, the hierarchical regressions highlighted that elevated levels of OC symptoms were uniquely associated with increased food approach behaviours, selective eating and food neophobia. However, OC symptoms were not linked to food avoidance as assessed by the AEBQ-avoidance scale.

Discussion

Given that existing research has linked OC symptoms to more severe atypical eating behaviours (e.g., eating disorder symptoms), this study sought to explore whether these associations extend to non-clinical atypical eating behaviours in the general population. The findings suggested that elevated levels of OC symptoms were linked to a range of non-clinical atypical eating behaviours, namely food approach behaviours and selective eating. Increases in overall OC symptom severity also significantly predicted food neophobia, selective eating and food approach behaviours when controlling for age, gender and mental health status. These findings suggested that OC symptoms, rather than demographic

factors, may have a substantial impact on the development of a broad spectrum of non-clinical atypical eating behaviours in the general population.

With regard to food avoidance behaviours, selective eating assessed by the APEQ was associated with OC symptoms, which aligns with the findings of Barnhart and colleagues (2021, 2023), who identified a positive correlation between OC symptoms and the APEQ in a sample of students. The current findings also further support research from Kauer and colleagues (2015) and Wildes and colleagues (2012), which indicated that selective eaters were more likely to exhibit elevated levels of OC symptoms compared to non-selective eaters.

However, it is important to acknowledge that while that selective eating assessed by the APEQ was associated with OC symptomatology in the current study, food avoidance measured using the AEBQ-avoidance scale was not. The AEBQ-avoidance scale is distinguishable from the APEQ as it broadly captures eating behaviours related to general food avoidance (e.g., emotional undereating and satiety responsivity). The APEQ provides a comprehensive assessment of only selective eating and considers its many facets, such as meal presentation and meal disengagement. This suggests that, although those with greater OC symptomatology are not broadly avoidant of food, they are more likely to engage in selective eating, and that this selectiveness may also extend to visual aspects of foods. Supporting this, evidence from Barnhart and colleagues (2023) reported that facets of selective eating, such as distinct preferences for meal presentation, were uniquely associated with elevated OC symptom severity; such preferences may be greater aligned with certain OC symptoms, such as those reflecting orderliness or obsessions. The relationship between OC symptoms and selective eating, rather than general food avoidance, is a pattern which warrants further investigation.

Whilst overall OC symptoms did not correlate with food neophobia, the hierarchical regressions observed that more severe levels of OC symptoms could predict greater food neophobia when controlling for other variables, such as age and gender. This may indicate that age or gender supressed the effect of OC symptoms in the correlational analyses. Limited studies have explored food neophobia and OC symptoms, however a previous study observed that OC symptoms were associated with food neophobia in a sample of children (Selles et al., 2021). The present study extended these findings to adults with elevated OC symptoms, highlighting the need to further examine the relationship between OC symptomatology and food neophobia across the lifespan.

The current study also observed that those with increased OC symptoms were more likely to engage in food approach behaviours. These findings align with two existing studies which observed a relationship between OC symptoms, bingeing and food addiction (Albertella et al., 2021; Barnhart et al., 2021). However, these studies and the present study are limited by the inconsistency of study measures used; the current study utilised the AEBQ, whereas food addiction was assessed using the Modified Yale Food Addiction Scale (Schulte & Gearhardt, 2017), and bingeing behaviours were measured using the Binge-Eating Scale (Gormally et al., 1982). Despite the inconsistency in methodology to date, the current results support the already existing, albeit small, evidence base, highlighting OC symptoms to be associated with greater food approach behaviours in the general population. These findings raise important implications given that food approach behaviours, such as emotional overeating, have been consistently linked to eating disorders and health adversities (Carnell & Wardle, 2007; Gross et al., 2016; Herle et al., 2020; Özdemir & Bilgic, 2018). Therefore, interventions to support lifestyle factors, such as diet and eating behaviours, may be of relevance to this group to help prevent co-occurring physical and psychological difficulties.

There are some limitations of the study to note. Concerning the assessment tools used, some of the measures, such as the APEQ and certain subscales of the AEBQ, demonstrated poor internal reliability, suggesting that they may not accurately assess the corresponding eating behaviour. Therefore, alternative measures or further replications of the study are required to reaffirm the findings. Additionally, all study measures were based on self-report tools which do not provide an objective view of non-clinical atypical eating behaviours in individuals with OC symptoms. The self-selection recruitment strategy might have also introduced bias, as participants may volunteer for studies which align with their own experiences or behaviours (Kaźmierczak et al., 2023). For example, those who resonate with atypical eating behaviours may have felt more motivated to participate. Despite these limitations, this is one of the first studies to address eating behaviours which typically do not warrant clinical intervention, whilst also controlling for factors such as age, gender and having a mental health condition (e.g., Bartholdy et al., 2017; Cederlöf et al., 2015; Garcia et al., 2020).

In summary, the findings from this chapter suggest that pathological eating patterns not warranting clinical intervention may occur among adults with OC symptoms in the general population, with selective eating and food approach behaviours being particularly common. Future research should further examine the mechanisms underlying this association and the potential impact of these eating behaviours on diet or nutritional intake. Research of this kind could improve the understanding of how to tailor interventions that address dietary management and relationships with food, particularly in vulnerable groups.

Chapter 4: Examining the association between obsessive-compulsive symptoms and eating disorder symptoms in the general population

Overview

Eating disorders and OCD commonly co-occur, and there is some evidence to suggest that this pattern extends beyond individuals with a clinical diagnosis to adults among the general population. However, existing research in the general population is limited and has primarily focused on eating disorder symptoms related to weight and shape concerns (i.e., anorexia nervosa and bulimia nervosa). Consequently, less is known about the relationship between OC symptoms and ARFID, which is an eating disorder characterised by extreme levels of food avoidance. The current Chapter expands on the study detailed in Chapter 3 by examining the relationship between OC symptoms and more severe atypical eating behaviours, including eating disorder symptoms related to weight and shape concerns, as well as extreme food avoidance.

Introduction

Symptoms of eating disorders, such as those observed in anorexia nervosa, bulimia nervosa and ARFID, may present in the general population, but will not reach the threshold for an eating disorder diagnosis and/or require intervention. Whilst not meeting the clinical threshold for a diagnosis, these symptoms can still pose significant challenges for those affected (Beals & Manore, 1994; Coelho et al., 2013; Kärkkäinen et al., 2018; Piran et al., 2007). Eating disorder symptoms in the general population are far more common than diagnosed eating disorders, with studies reporting the prevalence rates of subthreshold symptoms to be between 10% and 30% (Alfalahi et al., 2022; Reba-Harreleson et al., 2009; Solmi et al., 2014). Eating disorder symptoms are reported by males and females, however females are affected at significantly higher rates (Solmi et al., 2014).

It has been observed that adults of the general population who present with eating disorder symptomatology often experience elevated levels of OC symptoms. For example, more severe OC symptoms have been associated with eating disorder symptoms relating to anorexia nervosa and bulimia nervosa, which include bingeing behaviours, purging and dietary restriction (Barnhart et al., 2021; Zickgraf et al., 2019). Moreover, adults who display symptoms of anorexia nervosa and bulimia nervosa are more likely to experience clinically significant OC symptoms, which might require clinical intervention, compared to those who do not report any pathological eating behaviours (Wildes et al., 2012).

There are few studies exploring the relationship between OC symptoms and eating disorder symptoms relating to ARFID, however there is some preliminary evidence which suggests a link between this eating disorder subtype and OC symptoms. In a general population study by Zickgraf and colleagues (2016), adults with symptoms of ARFID reported significantly greater OC symptoms compared to typical eaters. The OC symptoms of adults with ARFID symptoms did not significantly differ to those displaying eating disorder symptoms related anorexia nervosa and bulimia nervosa, highlighting that OC symptoms are potentially associated with a broad range of eating disorder symptoms.

Further evidence which indicates that OC symptoms are associated with ARFID symptoms stems from studies of children and adults who have been formally diagnosed with ARFID. Studies involving both children and adults have reported OCD to be a common comorbidity, with prevalence rates ranging between 4% and 15% for children (Bryson et al., 2018; Cañas et al., 2021; Dahlsgaard & Bodie, 2018; Fisher et al., 2014; Kambanis et al., 2020; Lange et al., 2019; Thomas et al., 2020; Zickgraf, Murray, et al., 2019), and 7% and 15% for adults (Nitsch et al., 2023; Thomas et al., 2021). These prevalence rates are similar to that observed among other eating disorders, such as anorexia nervosa and bulimia nervosa, suggesting a shared vulnerability to OCD and/or OC symptoms across these conditions.

Given that OC symptoms and eating disorder symptoms are widely prevalent among the general population, a better understanding of their association is warranted for several reasons. To date, there has been a disproportionate focus on eating disorder symptoms associated with weight and shape concerns, particularly anorexia nervosa symptoms. However, whilst the diagnostic classification for ARFID was brought into effect over ten years ago (DSM-5, 2013), there have been very few studies that have focused on the relationship between ARFID and OC symptoms.

Furthermore, the few studies which do explore OC symptoms and eating disorder symptoms have primarily focused on the effect of overall OC symptoms. However, there is research which stipulates that specific OC symptoms (e.g., checking or obsessing) are uniquely associated with particular eating behaviours (Levinson, Zerwas, et al., 2019; Pollack & Forbush, 2013; Vanzhula et al., 2021). For example, Pollack and Forbush (2013) observed that OC symptoms of checking and cleaning could predict body dissatisfaction and dietary restraint. Moreover, checking behaviours were identified as a unique predictor of binge eating behaviours. Importantly, the relationships between these specific OC symptoms and eating disorder symptoms remained, even when controlling for perfectionism which is noted to underlie anorexia nervosa and bulimia nervosa symptoms. Therefore, it would be important to acknowledge the heterogeneity of OC symptoms given that they might be associated with different eating patterns (Vanzhula et al., 2021; Vorstenbosch et al., 2012). Understanding whether certain OC symptom subtypes are associated with particular eating disorder symptoms may also help to identify individuals at greater risk of developing these symptoms.

OCD and/or OC symptoms are also suggested to be a risk factor for eating disorders. Two longitudinal studies found that OC symptoms during childhood and adolescence were associated with developing anorexia nervosa in later life (Buckner et al., 2010; Micali et al., 2011). A separate study observed a similar relationship, but for bulimia nervosa, suggesting that OC symptoms may be a risk factor for multiple eating disorders (Hofer et al., 2018). In cases where OCD was observed to occur prior to anorexia nervosa, participants were also more likely to have poorer health outcomes and a more pathological BMI six to twelve years post-treatment (Carrot et al., 2017). Although these findings are yet to be replicated in the general population, OC symptoms and eating disorder symptoms both occur on a continuum and are considered a precursor to more severe symptoms. Understanding the relationship between OC symptoms and eating disorder symptoms in the general population may help to prevent more complex, severe disorders from developing.

Moreover, it is important to better understand eating disorder symptoms in the general population as such symptoms are associated with poor quality of life, adverse health consequences and psychological burden, despite not reaching the threshold of clinical diagnosis. Individuals displaying eating disorder symptoms are likely to experience social anxiety, suicidality and depression relative to their counterparts with diagnosed eating disorders (Dennard & Richards, 2013; Johnson et al., 2021). Evidence from clinical populations also suggests that individuals with co-occurring eating disorders

and OCD tend to present with greater overall psychopathology and are more resistant to treatment (Claes et al., 2021; Danner et al., 2022; Huke et al., 2014; Simpson et al., 2013).

This study aimed to expand on Chapter 3 by exploring the relationship between OC symptoms and more severe eating behaviours (i.e., eating disorder symptoms), whilst also drawing attention to the heterogeneity of OC symptom subtypes. To explore this aim, a cross-sectional, observational study was proposed. The eating disorder symptoms examined included those relating to anorexia nervosa and bulimia nervosa, as well as ARFID. Given that existing research has observed a relationship between anorexia nervosa and bulimia nervosa and OC symptoms in both the clinical and general populations, it was hypothesised that OC symptoms would be associated with eating disorder symptoms relating to anorexia nervosa and bulimia nervosa. However, as there is limited research concerning ARFID symptoms and the relationship between OC symptom subtypes and eating disorder symptoms, these hypotheses remained exploratory.

Methods

Ethical approval

The study was approved by the University of Hertfordshire's Ethics Committee on 15th July 2022: Protocol Number aLMS/PGR/UH/04943(1). A copy of the ethics approval notification can be found in Appendix 3. The protocol involved participants completing an online survey, consisting of questionnaires to assess OC symptoms, eating disorder symptoms and factors which could underlie atypical eating behaviours.

Participants

A sample of 181 adults, aged between 19 and 80 years (M=41.622, SD=13.81), from the general population were recruited via the online platform, Prolific (https://www.prolific.com, 2024). Of the participants, 127 were female and 53 were male. Volunteers were eligible to participate if they were over 18 years of age and able to comprehend written English. Those with OCD or an eating disorder were advised against taking part due to the nature of the questionnaires but were not prevented from participating. Recruitment for the study was completed over the period of one day and participants were paid at the rate of £9 per hour for the participation.

Procedure

The study was advertised to eligible volunteers on the online platform, Prolific. Interested volunteers were directed to the survey, which was hosted on Qualtrics (Provo, UT, https://www.qualtrics.com). Prior to accessing the questionnaires, participants had to read the participant information sheet (Appendix 18) and complete a consent form (Appendix 19). Thereafter, participants were directed to the study measures. All study measures were presented in the same order for each participant and took approximately 25 minutes to complete. Upon completion of the study, participants were presented with a debrief page (Appendix 20) detailing further information about the study and guidance on where to seek help if the questionnaires raised any issues for them. Participants were also provided with a study

completion code, which could be entered on the Prolific study page to receive their reimbursement. Personal identifiable information was not collected during the study and participants were solely identified by their Prolific identification code.

Measures

Demographics

Demographic information, including age, gender, occupation status and ethnic and ancestral origin was collected at the start of the study. Participants were also asked whether they had ever been diagnosed with a mental health condition by a healthcare professional. Those who had received a diagnosis were asked to disclose it. All responses were optional.

Body mass index

Participants were asked to report their height and weight to calculate their BMI. Height and weight measurements were converted to metres (m) and kilograms (kg), respectively, and BMI was calculated using the following formula: $BMI = kg/m^2$.

Obsessive-Compulsive symptoms

Obsessive-compulsive symptoms were assessed using the OCI-R (Foa et al., 2002) The OCI-R has a total of 18 items which are used to assess OC symptoms across six subscales: washing, obsessing, ordering, hoarding, checking and neutralising. Participants are required to respond to each item on a five-point Likert scale, ranging between *'0 – Not at all'* and *'4 – Extremely'*. All 18 items are summed to provide an overall OC symptom severity score, and subscales items can be totaled to indicate severity of specific OC symptoms. Total OCI-R scores range between 0 and 72 and subscale scores range between 0 and 12; higher scores indicate greater severity. Internal reliability of the OCI-R subscales ranged between acceptable to excellent: washing $\alpha = .843$; obsessing $\alpha = .922$; hoarding $\alpha = .768$, ordering $\alpha = .901$, checking $\alpha = .811$ and neutralising $\alpha = .810$. Overall OCI-R scores and subscale scores were used for the analysis.

Anorexia nervosa and bulimia nervosa symptoms

The Eating Attitudes Test-26 (EAT-26; Garner et al., 1982) is an abbreviated 26-item version of the EAT-40 which is used to identify the presence of eating disorder risk. Items of the scale refer to symptoms associated with anorexia nervosa and bulimia nervosa. The questionnaire consists of three subscales: dieting (EAT-D), bulimia and food preoccupation (EAT-BF), and oral control (EAT-OC). EAT-D refers to avoidance of fattening foods and a preoccupation with being thinner, EAT-BF represents thoughts about food and symptoms associated with bulimia, and EAT-OC refers to controlled eating and perceived pressure from others to gain weight.

Participants are asked to report how frequently they experience thoughts about eating and their body shape, and how often they engage in pathological eating behaviours. A 4-point rating scale is used,

ranging from *'3 – Always'* to *'0 – Sometimes, Rarely or Never'.* Total scores range between 0 and 78, with higher scores indicating a greater presence of eating disorder symptoms. Example items include *'am terrified of being overweight'* (EAT-D), *'feel that others would prefer if I ate more'* (EAT-OC) and *'feel that food controls my life'* (EAT-BF). Similarly to the EAT-40, a score of 20 or above is used to determine those at risk of an eating disorder. In the current study, the subscales of EAT-D and EAT-BF demonstrated good internal reliability with reliability coefficients of α = .885 and α = .806, respectively. The EAT-OC subscale had questionable internal reliability (α = .669). Total EAT-26 scores and subscale scores were used in the analysis.

Avoidant-restrictive food intake disorder

ARFID symptoms were assessed using the Nine-Item Avoidant/Restrictive Food Intake Disorder Screen (NIAS; Zickgraf & Ellis, 2018). The NIAS has a total of three subscales which correspond to the three profiles associated with ARFID: selective eating (NIAS-SE), lack of appetite or interest in food (NIAS-A) and fear of negative consequences associated with eating (NIAS-F). Example items include '*I dislike most foods that other people eat'* (NIAS-SE) and *'even when I am eating a food I really like it is hard for me to eat a large enough volume at meals' (*NIAS-A). Participants indicate their level of agreement for each item on 6-point scale, ranging from '*0 – Strongly Disagree'* to *'5 – Strongly Agree'*. Total scores range between 0 and 45, and subscale scores range between 0 and 15, with higher scores indicating a stronger presence of ARFID eating behaviours. Murray and colleagues (2021) suggested the following cutoff scores for the NIAS subscales: NIAS-SE ≥10; NIAS-A ≥9; NIAS-F ≥10. The developers of the tool observed good internal reliability (α = .87-93; Zickgraf & Ellis, 2018), with the present study observing similar levels of internal reliability (NIAS-SE, α = .892; NIAS-A, α = .865; NIAS-F, α = .887). NIAS total and subscale scores were used in the analysis.

Statistical analysis

All analyses were conducted using SPSS IBM Version 29 (SPSS Inc., Chicago, IL, USA). An initial set of two-tailed Pearson's correlations were carried out to explore the relationship between the study variables. Study variables included in the correlational analyses were OCI-R total scores, eating disorder symptoms (EAT-26 and NIAS total and subscale scores), age and BMI. Subsequently, a further set of two-tailed Pearson's correlations examined the relationships between OCI-R subscales (washing, checking, ordering, obsessing, hoarding and neutralising) and eating disorder symptoms (EAT-26 and NIAS total and subscale scores). Lastly, a series of hierarchal regressions were computed to investigate whether study variables could predict each type eating disorder symptom. In the first step, age, gender and mental health status (the presence or absence of a mental health condition) were examined as predictors of the eating disorder symptoms. The second step added overall OC symptom severity (OCI-R total) to the multiple regression model. In the third step, overall OC symptoms were removed from the model and OC symptom subtypes (washing, neutralising, checking, hoarding, ordering and obsessing) were examined as predictors of eating disorder symptoms, alongside the demographic variables.

As with Chapter 3, dummy variables were used to enter the categorical variables of gender and mental health status in the regression. Females were recoded as '1' and males were recoded as '0'; the presence of a mental health condition was coded as '1' and the absence of a mental health condition was coded as '0'. Positive beta coefficients would indicate that being female or having a mental health condition

would increase the predictive effect on the atypical eating behaviour, compared to being male or having a mental health condition, respectively.

Results

Sample statistics

Prior to analysis, the participant data was checked for completeness. Three participants did not provide any data and were removed. Moreover, the decision was made to remove participants aged over 65 years to minimise the confounding effect of age on eating behaviours. In total, data from 167 participants, aged between 19 and 65 years (M=39.93, SD=12.23), remained for the analysis. Of note, complete BMI data was not reported for 32.3% (n=54) of the sample; subsequently, BMI data is only presented for 113 participants. Descriptive statistics are reported in Table 4.1.

The final sample consisted of 122 females and 45 males. Of the participants, 91 were in full time employment, 40 were in part time employment, 11 were retired, 13 were not in employment and 10 were full-time students. Two participants preferred not to declare their occupation status.

Ninety percent of sample (n=150) were from white ethnic and ancestral backgrounds and 10% of the sample were from minority ethnic groups or ancestral backgrounds. The minority ethnic groups and ancestral backgrounds reported were: African (n=1), Arab (n=1), Indian (n=2), Bangladeshi (n=1), Chinese (n=2), Caribbean (n=2), any other Asian background (n=3) and any other mixed/multiple backgrounds (n=3).

Table 4.1.
Descriptive statistics of BMI, OC symptoms and eating disorder symptoms

Study variable	Mean (*SD*)
BMI	27.76 *(7.36)*
OCI-R	
Washing	1.92 *(2.70)*
Obsessing	3.98 *(3.34)*
Hoarding	3.95 *(2.82)*
Ordering	3.74 *(2.92)*
Checking	3.25 *(2.93)*
Neutralising	1.77 *(2.61)*
OCI-R total score	18.60 *(12.83)*
Eating disorder symptoms	
NIAS-SE	3.91 *(3.73)*
NIAS-A	2.64 *(3.19)*
NIAS-F	1.81 *(2.77)*
NIAS total	8.36 *(7.76)*
EAT-D	5.83 *(7.08)*
EAT-BF	1.80 *(3.15)*
EAT-OC	1.43 *(2.33)*
EAT-26 total	9.06 *(10.51)*

Note: BMI = Body-mass index; OCI-R = Obsessive-compulsive Inventory – Revised; NIAS = Nine-Item Avoidant/Restrictive Eating Disorder Screen;

NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; EAT-26 = Eating Attitudes Test – 26 item; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale

Correlations between study variables and eating disorder symptoms

Overall OC symptoms and eating disorder symptoms

A series of Pearsons's correlations examined whether there were relationships between overall OC symptoms (OCI-R total), age, BMI and eating disorder symptoms. Age had weak, negative associations with the OCI-R total, NIAS-A and NIAS total, such that younger participants expressed more OC symptoms and ARFID symptoms, respectively. BMI was not associated with any of the study variables. The OCI-R had positive and significant relationships with all eating disorder symptoms, except NIAS-SE; each of these correlations were weak in strength and the strongest association was between the OCI-R and EAT-26 total. These correlations are presented in Table 4.2.

Table 4.2.
Correlations between overall OC symptoms, age, BMI and eating disorder symptoms

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	**OCI-R total**	1										
2.	**Age**	-.163*	1									
3.	**BMI**	.126	.131	1								
4.	**NIAS-SE**	.094	-.093	.114	1							
5.	**NIAS-A**	.254**	-.191*	.040	.447**	1						
6.	**NIAS-F**	.236**	-.112	-.045	.397**	.550**	1					
7.	**NIAS total**	.234**	-.163*	.054	.806**	.821**	.773**	1				
8.	**EAT-D**	.341**	-.111	-.073	.161*	.239**	.215**	.252**	1			
9.	**EAT-BF**	.239**	-.061	.084	.020	-.024	.056	.020	.683**	1		
10.	**EAT-OC**	.264**	-.094	.025	.228**	.506**	.370**	.449**	.376**	.149	1	
11.	**EAT-26 total**	.360**	-.114	-.019	.165*	.266**	.244**	.275**	.961**	.793**	.519**	1

Note: $*p \leq .05$; $**p \leq .01$
OCI-R = Obsessive-compulsive Inventory – Revised; BMI = Body-Mass Index; NIAS = Nine-Item Avoidant/Restrictive Eating Disorder Screen; NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; EAT-26 = Eating Attitudes Test – 26 item; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale

OC symptoms subtypes and eating disorder symptoms

A second set of Pearson's correlations explored whether there were significant relationships between OC symptom subtypes (OCI-R subscales) and eating disorder symptoms. The OC symptom of washing was the most common correlate of the eating disorder symptoms; washing was positively and weakly correlated with all eating disorder symptoms, except EAT-BF, with the strongest association being with NIAS-A. OC obsessing symptoms were positively and weakly correlated with the NIAS-A, EAT-D, EAT-BF and EAT-26 total scores. OC hoarding symptoms shared weak-moderate positive associations

with all EAT-26 scores, except the EAT-OC. OC ordering symptoms were weakly and positively correlated with all eating disorder symptoms, except NIAS-SE and EAT-BF. OC checking symptoms correlated weakly and positively with the NIAS-A and all EAT-26 scores, except EAT-BF. OC neutralising symptoms shared weak and positive relationships with the EAT-D and EAT-26 total scores, and all NIAS scores, except NIAS-SE. These correlations are presented in Table 4.3.

Table 4.3.
Correlations between OC symptom subtypes and eating disorder symptoms

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	**Washing**	1													
2.	**Obsessing**	.483**	1												
3.	**Hoarding**	.321**	.535**	1											
4.	**Ordering**	.438**	.454**	.336**	1										
5.	**Checking**	.478**	.483**	.280**	.552**	1									
6.	**Neutralising**	.543**	.500**	.343**	.572**	.541**	1								
7.	**NIAS-SE**	.194*	-.034	.021	.143	.058	.058	1							
8.	**NIAS-A**	.226**	.162*	.099	.211**	.243**	.195*	.447**	1						
9.	**NIAS-F**	.372**	.114	.111	.172*	.053	.256**	.397**	.550**	1					
10.	**NIAS total**	.319**	.091	.091	.216**	.146	.199**	.806**	.821**	.773**	1				
11.	**EAT-D**	.218**	.233**	.356**	.243**	.168*	.292**	.161*	.239**	.215**	.252**	1			
12.	**EAT-BF**	.114	.267**	.344**	.107	.054	.148	.020	-.024	.056	.020	.683**	1		
13.	**EAT-OC**	.292**	.139	.149	.263**	.182*	.148	.228**	.506**	.370**	.449**	.376**	.149	1	
14.	**EAT-26 total**	.246**	.268**	.376**	.254**	.170*	.274**	.165*	.266**	.244**	.275**	.961**	.793**	.519**	1

Note: $*p \leq .05$; $**p \leq .01$
OCI-R = Obsessive-compulsive Inventory – Revised; BMI = Body-Mass Index; NIAS = Nine-Item Avoidant/Restrictive Eating Disorder Screen; NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; EAT-26 = Eating Attitudes Test – 26 item; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale.

Study variables as predictors of eating disorder symptoms

Lastly, a series of hierarchical regressions examined the predictive effect of demographic variables, overall OC symptoms and OC symptom subscales on the eating disorder symptoms. Three regression models were tested: Model 1 consisted of only demographic variables, Model 2 included overall OC symptoms (total OCI-R score) alongside the demographic variables, and Model 3 included the demographic variables and OC symptom subtypes (OCI-R subscales). Tables 4.5-4.12 provide summaries of the hierarchical regressions.

Prior to carrying out the hierarchical regressions, assumption testing was carried out. First, the dependent variables were examined for normality of distribution using the Shapiro-Wilk Test. The dependent variables did not have a normal distribution; however, this finding was not unexpected as the measures are used to assess symptoms of eating disorders. Tolerance values were above .4 and VIF scores remained below 2 (see table 4.4). As expected, there was collinearity between the OCI-R total scores and subscale scores; given the collinearity between these variables, the predictions of Model 2 and Model 3 were only compared against Model 1. In many cases, the dependent variables were correlated with the OCI-R total and subscale scores, but not with age, gender or mental health.

Inspection of Probability-Plots suggested normality of the residuals for all the dependent variables, except the EAT-D, EAT-BF and EAT-OC. Standard residuals remained between -3 and 3.4, however standard residuals for the EAT-OC exceeded 4. Cook's Distance scores were below 1, indicating individual cases did not affect the models.

Table 4.4.
Tolerance and VIF values for predictors across the hierarchical regression models

Model	Predictor	Tolerance	VIF
1	Age	.996	1.004
	Gender	.984	1.016
	Mental health status	.984	1.016
2	Age	.978	1.023
	Gender	.984	1.016
	Mental health status	.941	1.063
	OCI-R total	.937	1.068
3	Age	.976	1.034
	Gender	.934	1.071
	Mental health status	.825	1.212
	Washing	.621	1.609
	Obsessing	.470	2.127
	Hoarding	.678	1.475
	Ordering	.581	1.721
	Checking	.564	1.772
	Neutralising	.518	1.932

Note: Mental health status = presence or absence of a mental health disorder; OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Study variables as predictors of the Nine-Item ARFID Screen

The first series of hierarchical regressions explored whether the three models could predict NIAS total and subscale scores. With regards to NIAS total scores, Model 1 was significant (R^2 = .055, adjusted R^2 = .038, $F(3, 163) = 3.174$, p = .026), accounting for 5.5% variance in the scores. Age and gender were significant predictors in Model 1; being female was predictive of increased overall NIAS scores (β = .17, p = .028), and a one standard deviation increase in age led to a .10 standard deviation decrease in overall NIAS scores (β = -.16, p = .041).

Model 2 was also significant (R^2 = .103, adjusted R^2 = .080, $F(4, 162) = 4.627$, p = .001) and explained 10.3% of the variance in NIAS total scores. As in Model 1, gender was a significant predictor, whereby being female could predict greater overall NIAS scores (β = .18, p = .019). The OCI-R total was also a significant predictor (β = .23, p = .004), such that a one standard deviation increase in OCI-R total scores resulted in a .23 standard deviation increase in overall NIAS scores. Model 2 accounted for significantly more variance in overall NIAS scores compared to Model 1 (R^2 change = .047, *F-change* (1, 162) = 8.547, p = .004).

Model 3 also significantly predicted overall NIAS scores, accounting for 17.7% of the variance (R^2 = .177, adjusted R^2 = .130, $F(9, 157) = 3.748$, p = <.001). Being female could predict greater overall NIAS scores (β = .22, p = .005). OCI-R washing symptoms were also a significant predictor of overall NIAS scores, whereby a one standard deviation increase in OCI-R washing was associated with a .31 standard deviation increase in overall NIAS scores (β = .31, p <.001). Compared to Model 1, Model 3 accounted for significantly more variance in overall NIAS scores (R^2 change = .122, *F-change* (6, 157) = 3.867, p = .001).

In summary, overall OC symptoms, as well as OC symptoms of washing, were associated with the expression of overall ARFID symptoms. Female gender was also significantly associated with ARFID symptoms when controlling for OC symptoms. Models 2 and 3, which included OC symptoms, accounted for more variance than Model 1 alone, which only included demographic variables. Statistical values can be found in Table 4.5.

Table 4.5.
Summary of hierarchical regression analysis for study variables predicting overall NIAS scores

	Model 1				**Model 2**				**Model 3**			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	10.189***	.00	4.41	**<.001**	6.97**	.00	2.77	**.006**	6.68**	.00	2.64	**.009**
Age	-.10*	-.16	-2.06	**.041**	-.08	-.12	-.163	.105	-.07	-.11	-1.43	.155
Gender	2.96*	.17	2.21	**.028**	3.09*	.18	2.36	**.019**	3.75**	.22	2.87	**.005**
Mental health status	-.01	.00	-.01	.996	-.83	-.05	-.67	.506	-.49	-.03	-.38	.704
OCI-R total					.14**	.23	2.92	**.004**				
Washing									.90***	.31	3.38	**<.001**
Obsessing									-.41	-.18	-1.64	.102
Hoarding									.04	.01	.15	.878
Ordering									.42	.16	1.65	.101
Checking									-.08	-.03	-.31	.753
Neutralising									.12	.04	.40	.693
R^2 / R^2 adjusted		.055 / .038				.103 / .080				.177 / .130		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Concerning NIAS-SE scores, neither Model 1 (R^2 = .034, adjusted R^2 = .16, $F(3, 163) = 1.909$, p = .130) nor Model 2 (R^2 = .044, adjusted R^2 = .020, $F(4, 162) = 1.850$, p = .122) were significant predictors. Model 3, however, was significant and accounted for 11.9% of the NIAS-SE scores (R^2 = .119, adjusted R^2 = .068, $F(9, 157) = 2.356$, p = .016). OCI-R washing and obsessing scores were significant predictors: a one standard deviation increase in OCI-R washing scores led to a .26 standard deviation increase in NIAS-SE (β = .26, p = .007), and a one standard deviation increase in OCI-R obsessing scores resulted in a .23 standard deviation decrease in NIAS-SE scores (β = -.23, p = .035). Model 3 explained significantly more variance in NIAS-SE scores compared to Model 1 (R^2 change = .085, *F-change*(6, 157) = 2.525, p = .023).

To summarise, only Model 3, which included specific OC symptoms, could predict ARFID symptoms associated with selective eating. Those experiencing OC symptoms of washing experienced more ARFID symptoms, whereas those with obsessing symptoms were less likely to experience these symptoms. Statistical values are presented in Table 4.6.

Table 4.6.
Summary of hierarchical regression analysis for study variables predicting the NIAS-SE

	Model 1				**Model 2**				**Model 3**			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	4.27***	.00	3.80	**<.001**	3.57**	.00	2.86	**.005**	3.13*	.00	2.49	**.014**
Age	-.03	-.09	-1.19	.236	-.02	-.08	-.98	.329	-.02	-.06	-.78	.437
Gender	1.28	.15	1.97	.051	1.30*	.16	2.01	**.046**	1.67*	.20	2.57	**.011**
Mental health status	-.50	-.06	-.83	.408	-.68	-.09	-1.10	.273	-.36	-.05	-.56	.578
OCI-R total					.03	.10	1.28	.201				
Washing									.36**	.26	2.73	**.007**
Obsessing									-.26*	-.23	-2.12	**.035**
Hoarding									.02	.02	.18	.857
Ordering									.25	.19	1.93	.056
Checking									-.03	-.03	-.25	.800
Neutralising									-.08	-.06	-.54	.593
R^2 / R^2 adjusted		.034 / .016				.044 / .030				.119 / .068		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

With regards to the NIAS-A, Model 1 was significant and accounted for 5.3% of the variance in the NIAS-A scores (R^2 = .053, adjusted R^2 = .036, $F(3, 163) = 3.071$, p = .029). Age was a significant predictor, such that a one standard deviation increase in age contributed to a .19 standard deviation decrease in NIAS-A scores (β = -.19, p = .016).

Model 2 was also significant and explained 10.6% of the variance in NIAS-A scores (R^2 = .106, adjusted R^2 = .084, $F(4, 162) = 4.788$, p = .001). Age (β = -.15, p = .049) and OCI-R total scores (β = .24, p = .002) were both significant predictors. A one standard deviation increase in age resulted in a .15 standard deviation decrease in NIAS-A scores, whereas a one standard deviation increase in OCI-R total scores led to a .24 standard deviation increase in NIAS-A scores. Model 2 explained more variance in NIAS-A scores compared to Model 1 (R^2 change = .052, *F-change*$(1, 162) = 9.463$, p = .002).

Model 3 was also a significant predictor of NIAS-A scores, accounting for 12.2% of the variance in scores (R^2 = .122, adjusted R^2 = .072, $F(9, 157) = 2.430$, p = .013). Gender was a significant predictor, whereby being female was associated with increases in NIAS-A scores (β = .16, p = .042). Model 3 did not significantly account for more variance in NIAS-A scores compared to Model 1 (R^2 change = .069, *F-change*$(6, 157) = 2.051$, p = .062).

Overall, each of the three models were significant, however only Model 2 explained more variance in ARFID low appetite symptoms compared to demographic variables alone (Model 1). Those with greater OC symptoms experienced more ARFID symptoms related to reduced appetite; age was still associated with ARFID low appetite symptoms when controlling for overall OC symptoms. Statistical values are presented in Table 4.7.

Table 4.7.
Summary of hierarchical regression analysis for study variables predicting the NIAS-A

	Model 1				**Model 2**				**Model 3**			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	3.85***	.00	4.06	**<.001**	2.46*	.00	2.39	**.018**	2.27*	.00	.211	**.036**
Age	-.05*	-.19	-2.42	**.016**	-.04*	-.15	-1.98	**.049**	-.04	-.14	-1.80	.074
Gender	.91	.13	1.65	.101	.96	.13	1.80	.074	1.13*	.16	2.05	**.042**
Mental health status	.15	.02	.30	.765	-.20	-.03	-.40	.691	-.08	-.01	-.14	.885
OCI-R total					.06**	.24	3.08	**.002**				
Washing									.13	.11	1.16	.247
Obsessing									-.04	-.04	-.37	.713
Hoarding									.00	.00	-.04	.971
Ordering									.10	.09	.94	.348
Checking									.15	.14	1.39	.166
Neutralising									.02	.02	.16	.870
R^2 / R^2 adjusted		.053 / .036				.106 / .084				.122 / .072		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Regarding NIAS-F scores, Model 1 was not a significant predictor (R^2 = .033, adjusted R^2 = .015, F(3, 163) = 1.848, p = .140). However, Model 2 was a significant, accounting for 7.9% of the variance in NIAS-F scores (R^2 = .079, adjusted R^2 = .056, F(4, 162) = 3.461, p = .010). The OCI-R total was a significant predictor of the NIAS-F, such that a one standard deviation increase in OCI-R total scores resulted in a .22 increase in NIAS-F scores (β = .22, p = .005). Model 2 explained more variance in NIAS-F scores compared to Model 1 (R^2 change = .046, *F-change*(1, 162) = 8.058, p = .005).

Model 3 could also significantly predict NIAS-F scores and accounted for 20.7% of the variance (R^2 = .207, adjusted R^2 = .162, F(9, 157) = 4.554, p = <.001). OCI-R washing (β = .40, p = <.001) and checking (β = -.21, p = .028) symptoms were both significant predictors of the NIAS-F. A one standard deviation increase in OCI-R washing symptoms led to a .4 standard deviation increase in NIAS-F scores, whereas a one standard deviation increase in OCI-R checking symptoms resulted in a .21 standard deviation decrease in NIAS-F scores. Model 3 explained more variance in NIAS-F scores compared to Model 1 (R^2 change = .174, *F-change*(6, 157) = 5.745, p = <.001).

In summary, only Models 2 and 3, containing overall OC symptoms and OC symptom subtypes, could predict ARFID symptoms associated with fearing the consequences eating. Those with greater overall OC symptoms, as well as specific OC symptoms of washing, were more likely to exhibit ARFID

symptoms associated with fearing the consequences of eating. Conversely, those with fewer checking behaviours were less likely to avoid food for this reason. Statistical values are reported in Table 4.8.

Table 4.8.
Summary of hierarchical regression analysis for study variables predicting the NIAS-F

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	2.07**	.00	2.48	**.014**	.94	.00	1.03	.304	1.28	.00	1.44	.152
Age	-.02	-.10	-1.35	.179	-.02	-.07	-.92	.357	-.01	-.06	-.79	.430
Gender	.77	.12	1.60	.110	.82	.13	1.74	.084	.95*	.15	2.08	**.039**
Mental health status	.34	.06	.76	.447	.05	.01	.12	.908	-.05	-.01	-.12	.905
OCI-R total					.05**	.22	2.84	**.005**				
Washing									.41***	.40	4.37	**<.001**
Obsessing									-.11	-.13	-1.24	.218
Hoarding									.02	.02	.23	.820
Ordering									.07	.08	.83	.406
Checking									-.20*	-.21	-2.22	**.028**
Neutralising									.18	.17	1.69	.092
R^2 / R^2 adjusted		.033 / .015				.079 / .056				.207 / .162		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder

Study variables as predictors of the Eating Attitudes Test-26

Model 1 was not a significant predictor of EAT-26 total scores (R^2 = .028, adjusted R^2 = .010, F(3, 162) = 1.560, p = .201), however Model 2 was significant and accounted for 15.4% of the variance (R^2 = .154, adjusted R^2 = .133, F(4, 161) = 7.328, p = <.001). OCI-R symptoms were a significant predictor (β = .37, p = <.001) whereby a one standard deviation increase in OCI-R total scores resulted in a .37 standard deviation increase in EAT-26 total scores. Model 2 accounted for more variance in total EAT-26 scores compared to Model 1 (R^2 change = .126, *F-change*(1, 161) = 23.968, p = <.001).

Model 3 could also significantly predict EAT-26 total scores, accounting for 19.9% of the variance (R^2 = .199, adjusted R^2 = .153, F(9, 156) = 4.315, p = <.001). OCI-R hoarding symptoms were a significant predictor of EAT-26 total scores (β = .29, p = .001); a one standard deviation increase in OCI-R hoarding resulted in a .29 standard deviation increase in EAT-26 total scores. Model 3 accounted for significantly more variance in EAT-26 total scores than Model 1 (R^2 change = .171, *F-change*(6, 156) = 5.560, p = <.001).

These findings indicate that, for overall EAT-26 scores, only Models 2 and 3 could predict eating disorder symptoms concerning anorexia nervosa and bulimia nervosa. In general, those with greater overall OC symptoms and symptoms related to hoarding were more likely to express greater eating disorder symptomatology. Statistical values can be found in Table 4.9.

Table 4.9.
Summary of hierarchical regression analysis for study variables predicting overall EAT-26 scores

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	10.68***	.00	3.32	**.001**	3.90	.00	1.18	.241	3.53	.00	1.04	.300
Age	-.09	-.11	-1.39	.167	-.05	-.06	-.81	.419	-.06	-.07	-.99	.323
Gender	2.94	.12	1.59	.114	3.03	.13	1.75	.082	2.96	.12	1.68	.095
Mental health status	-.18	-.01	-.10	.919	-1.87	-.08	-1.14	.258	-1.35	-.06	-.77	.441
OCI-R total					.31***	.37	4.90	**<.001**				
Washing									.30	.08	.84	.404
Obsessing									-.01	.00	-.04	.971
Hoarding									1.08***	.29	3.32	**.001**
Ordering									.37	.10	1.09	.278
Checking									-.22	-.06	-.64	.522
Neutralising									.51	.12	1.24	.215
R^2 / R^2 adjusted	.028 / .010				.154 / .133				.199 / .153			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Model 1 could not significantly predict EAT-D scores (R^2 = .028, adjusted R^2 = .010, F(3, 162) = 1.531, p = .208), however Model 2 was a significant predictor, accounting for 14.4% of the variance in scores (R^2 = .144, adjusted R^2 = .123, F(4, 161) = 6.772, p = <.001). OCI-R total scores were a significant predictor; a one standard deviation in OCI-R total scores led to a .35 standard deviation increase in EAT-D scores (β = .35, p = <.001). Compared to Model 1, Model 2 explained significantly more variance in EAT-D scores (R^2 change = .116, *F-change*(1, 161) = 21.902, p = <.001).

Model 3 was also a significant predictor of EAT-D scores, accounting for 19.2% of the variance (R^2 = .192, adjusted R^2 = .146, F(9, 156) = 4.132, p = <.001). OCI-R hoarding symptoms were a significant predictor of EAT-D scores, whereby a one standard deviation increase in OCI-R hoarding scores resulted in a .28 standard deviation increase in EAT-D scores (β = .28, p = .002). Model 3 accounted for significantly more variance in EAT-D scores compared to Model 1 (R^2 change = .165, *F-change*(6, 156) = 5.310, p = <.001).

To summarise, only the models including OC symptoms were significant predictors of dieting eating disorder symptoms. Individuals with greater overall OC symptoms and OC symptoms reflecting hoarding were more likely to engage dieting eating disorder behaviours. Statistical values are presented in Table 4.10.

Table 4.10.
Summary of hierarchical regression analysis for study variables predicting the EAT-D

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	7.01***	.00	3.24	**.001**	2.62	.00	1.17	.244	2.45	.00	1.07	.288
Age	-.06	-.11	-1.36	.174	-.03	-.06	-.81	.421	-.04	-.07	-.97	.334
Gender	1.97	.12	1.58	.116	2.03	.13	1.73	.086	2.10	.13	1.76	.080
Mental health status	-.49	-.03	-.42	.676	-.158	-.11	-1.42	.158	-1.24	-.08	-1.06	.293
OCI-R total					.20***	.35	4.68	**<.001**				
Washing									.10	.04	.42	.675
Obsessing									-.09	-.04	-.39	.694
Hoarding									.71**	.28	3.21	**.002**
Ordering									.21	.09	.90	.368
Checking									-.12	-.05	-.53	.598
Neutralising									.53	.19	1.93	.055
R^2 / R^2 adjusted		.028 / .010				.144 / .123				.192 / .146		

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

With regards to EAT-BF scores, Model 1 was not a significant predictor (R^2 = .038, adjusted R^2 = .021, $F(3, 162) = 2.156$, $p = .095$), however Model 2 was significant, accounting for 8.5% of the variance (R^2 = .085, adjusted R^2 = .062, $F(4, 161) = 3.742$, $p = .006$). OCI-R total scores significantly predicted EAT-BF scores ($\beta = .22$, $p = .005$), whereby a one standard deviation increase in OCI-R total scores led to a .22 standard deviation increase in EAT-BF scores. Compared to Model 1, Model 2 explained significantly more variance in EAT-BF scores (R^2 change = .047, *F-change*$(1, 161) = 8.211$, $p = .005$).

Model 3 could also significantly predict EAT-BF scores, accounting for 15.8% of the variance in scores (R^2 = .15.8, adjusted R^2 = .110, $F(9, 156) = 3.257$, $p = .001$). OCI-R hoarding was a significant predictor, whereby a one standard deviation increase in OCI-R hoarding led to a .3 standard deviation increase in EAT-BF scores ($\beta = .30$, $p = <.001$). Model 3 explained significantly more variance in EAT-BF scores compared to Model 1(R^2 change = .120, *F-change*$(6, 156) = 3.700$, $p = .002$).

As with previous hierarchical models predicting the EAT-26, only the models including OC symptoms were significant predictors of bulimia and food preoccupation symptoms. Those with greater overall OC symptoms and OC symptoms of hoarding were more likely to engage to display symptoms of bulimia and be more preoccupied with food. Table 4.11 presents a summary of the statistical values.

Table 4.11.
Summary of hierarchical regression analysis for study variables predicting the EAT-BF

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	1.30	.00	1.36	.176	.07	.00	.06	.949	.05	.00	.04	.964
Age	-.01	-.05	-.63	.527	-.01	-.02	-.26	.798	-.01	-.04	-.57	.568
Gender	1.09*	.15	1.97	**.050**	1.11*	.16	2.05	**.042**	.88	.12	1.162	.107
Mental health status	.60	.09	1.16	.248	.29	.04	.56	.578	.37	.06	.69	.491
OCI-R total					.06**	.22	2.87	**.005**				
Washing									-.03	-.03	-.28	.777
Obsessing									.10	.10	.93	.352
Hoarding									.34***	.30	3.36	**<.001**
Ordering									.00	.00	-.02	.983
Checking									-.09	-.09	-.89	.377
Neutralising									.06	.05	.44	.659
R^2 / R^2 adjusted	.038 / .021				.085 / .062				.158 / .110			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Concerning EAT-OC scores, Model 1 was not a significant predictor (R^2 = .013, adjusted R^2 = -.005, $F(3, 162) = .719$, $p = .542$). Model 2, however, could significantly predict EAT-OC scores and accounted for 8.7% of the variance (R^2 = .087, adjusted R^2 = .065, $F(4, 161) = 3.847$, $p = .005$). OCI-R total scores were a significant predictor of the EAT-OC ($\beta = .28$, $p = <.001$), where a one standard deviation increase in OCI-R total scores resulted in a .28 standard deviation increase in EAT-OC scores. Model 2 explained significantly more variance in EAT-OC scores compared to Model 1(R^2 change = .074, *F-change*(1, 161) = 13.072, $p = <.001$).

Model 3 was also a significant predictor of EAT-OC, accounting for 13% of the variance in scores (R^2 = .130, adjusted R^2 = .080, $F(9, 156) = .2.594$, $p = .008$). OCI-R washing ($\beta = .26$, $p = .006$) and ordering scores (β = .21, p = .038) were significant predictors of EAT-OC scores; a one standard deviation increase in OCI-R washing scores resulted in a .26 standard deviation increase in EAT-OC scores, whereas a one standard deviation increase in OCI-R ordering scores led to a .21 standard deviation increase. Model 3 explained significantly more variance in EAT-OC scores compared to Model 1 (R^2 change = .117, *F-change*(6, 156) = 3.498, $p = .003$).

Models 2 and 3, which included OC symptoms, were significant predictors of eating disorder symptoms related to oral control. Those with greater overall OC symptoms and OC symptoms of ordering and washing were more likely to engage to display symptoms concerning oral control. Statistical values can be found in Table 4.12

Table 4.12.
Summary of hierarchical regression analysis for study variables predicting the EAT-OC

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	2.37**	.00	3.29	**.001**	1.21	.00	1.59	.114	1.04	.00	1.32	.188
Age	-.02	-.10	-1.26	.211	-.01	-.06	-.80	.423	-.01	-.05	-.69	.489
Gender	-.12	-.02	-.29	.774	-.10	-.02	-.26	.795	-.02	.00	-.04	.966
Mental health status	-.29	-.06	-.74	.459	-.58	-.12	-1.151	.132	-.47	-.10	-1.17	.243
OCI-R total					.05***	.28	3.62	**<.001**				
Washing									.23**	.26	2.77	**.006**
Obsessing									-.02	-.03	-.25	.807
Hoarding									.04	.05	.51	.614
Ordering									.17*	.21	2.09	**.038**
Checking									.00	-.01	-.05	.957
Neutralising									-.08	-.09	-.85	.394
R^2 / R^2 adjusted	.013 / -.005				.087 / .065				.130 / .080			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale; Mental health status = presence or absence of a mental health disorder.

Summary of hierarchical regression analysis

In summary, the hierarchical regression analyses indicated that OC symptoms, over and above demographic variables, could predict eating disorder symptoms related to ARFID and anorexia nervosa and bulimia nervosa. Hoarding appeared to be the most related to anorexia nervosa and bulimia nervosa symptoms, and OC washing was most commonly linked to ARFID symptoms**.**

Discussion

This study aimed to explore the relationship between OC symptoms and eating disorder symptoms in adults of the general population. As existing research suggests an association between OC symptomatology and eating disorders related to weight and shape concerns, the current study examined whether such patterns also extend to extreme food avoidance (i.e., ARFID), and to understand whether specific OC symptoms are uniquely associated with these eating disorder symptoms. It was hypothesised that overall OC symptoms would be associated with symptoms of anorexia nervosa and bulimia nervosa. Exploratory hypotheses remained for the relationship between OC symptoms and ARFID, and the relationships between OC symptom subtypes and eating disorder symptoms.

The relationship between overall OC symptoms and eating disorder symptoms

The hypothesis that there would be a relationship between overall OC symptoms and eating disorder symptoms relating to anorexia nervosa and bulimia nervosa was confirmed; elevated levels of OC symptoms correlated with anorexia nervosa and bulimia nervosa symptoms. Moreover, the hierarchical

regressions highlighted that OC symptoms could predict anorexia nervosa and bulimia nervosa symptoms beyond demographic risk factors, such as age or gender; this suggests that OC symptoms, rather than these demographic factors alone, may represent a stronger determinant of eating disorder symptomatology in adults from the general population (Barakat et al., 2023; Meier et al., 2015). The findings of the study add to the existing body of research which has observed a relationship between OC symptoms and eating disorder symptoms across the continuum of severity (Barnhart et al., 2021; Pollack & Forbush, 2013; Wildes et al., 2012; Zickgraf et al., 2016).

Concerning clinical levels of food avoidance, overall OC symptoms were also associated with symptoms of ARFID. Greater overall ARFID symptoms, as well as symptoms related to reduced appetite and fearing foods, correlated with and could be predicted by elevated levels of OC symptoms, indicating that OC symptoms may not only contribute towards eating pathologies associated with weight and shape concerns, but also those characterised by extreme food avoidance. These findings align with that of Zickgraf and colleagues (2016) who highlighted that greater levels of OC symptoms were observed among adults in the general population who display symptoms of ARFID. Interestingly, the current study found no significant relationship between overall OC symptoms and the ARFID profile related to selective eating; however, a relationship did emerge between OC washing and obsessing symptoms and the selective eating profile of ARFID, supporting the idea that specific OC symptoms may map onto certain eating behaviours. Again, the effect of OC symptoms on ARFID surpassed that of age, gender and whether the individual had a diagnosed mental health condition, highlighting the important role of OC symptoms in ARFID.

There is limited understanding as to why OC symptoms are related to ARFID. However, it is possible that the relationship may be partially explained by the similar presentations of OC symptoms and ARFID symptoms. For example, there is a degree of overlap between the ARFID fear of eating profile and OC symptoms; an individual with ARFID symptoms may have obsessions about becoming unwell, or experiencing discomfort from eating, which could lead to the compulsive avoidance of some foods, echoing the cycle of obsessions and compulsions. Moreover, both ARFID and OC symptoms are associated with other clinical diagnoses, such as autism spectrum disorder, where ARFID is significantly prevalent (Sader et al., 2025), as well as anxiety and depression, which is often linked to reduced appetite (Bergdahl & Bergdahl, 2002; Maxwell & Cole, 2009; Yau & Potenza, 2013). Such patterns support the broader view that extreme levels of food avoidance may stem from the transdiagnostic processes across these disorders.

The study findings suggest that OC symptoms are associated with a broad spectrum of eating disorder symptomatology. Those with greater overall OC symptoms experienced varied challenges with eating, including eating disorder symptoms concerning weight and shape concerns and clinical levels of food avoidance. These findings add to the scarce body of evidence which suggests food avoidance is also linked to OC symptoms, and that these patterns occur beyond those with clinical diagnoses.

OC symptom subtypes and their relationship with eating disorder symptoms

The study also highlighted that specific OC symptom subtypes were uniquely associated with eating disorder symptoms. Elevated OC hoarding symptoms could predict increased levels of overall anorexia nervosa and bulimia nervosa symptoms, as well as those related to dieting, bulimia and food preoccupation. However, eating disorder symptoms relating to oral control were uniquely predicted by washing and ordering symptomatology; this differentiation suggests that specific OC symptoms may

correspond to different behavioural components of eating pathologies. For example, those with hoarding-related symptoms, reflecting difficulties in discarding items, may correspond to difficulties in relinquishing control over food, whereas washing and ordering may be associated with rigid or rule-bound eating behaviours.

The relationship between OC hoarding symptoms and anorexia nervosa and bulimia nervosa has been noted in other studies, although the findings are mixed. For example, Vanzhula and colleagues (2021) found hoarding to be associated with bingeing symptoms in a mixed sample of adults from the general population and those with eating disorders. In contrast, Pollack and Forbush (2013) observed eating disorder symptoms in the general population to be associated with checking and cleaning symptoms, rather than hoarding. In a clinical study of adults with diagnosed anorexia nervosa, Levinson and colleagues (2019) found that hoarding was associated with bulimic symptoms, however obsessing symptoms had a unique relationship with most anorexia nervosa symptoms. These mixed findings highlight the complex nature of atypical eating behaviours and may reflect that other factors may be implicated in their relationship with OC symptoms. Moreover, given that hoarding is now classified as an obsessive-compulsive and related disorder, rather than a subtype of OCD (Albert et al., 2015), further research is needed to determine whether eating disorder symptoms are linked to OCD more broadly, or to specific obsessive-compulsive and related disorders.

Concerning clinical food avoidance, this was the first study to examine whether OC symptom subtypes were associated with specific profiles of ARFID. Here, OC neutralising and washing symptoms were the most common correlate of ARFID, however washing symptoms were most consistent predictor when controlling for all OC symptoms, predicting overall ARFID symptoms, as well as symptoms related to selective eating and the fear of eating due to adverse consequences. This latter finding is particularly important as it highlights a potential contamination-related pathway between OC symptoms and ARFID, whereby fears of contamination or illness may manifest as avoidant or restrictive eating behaviours.

There is currently no research examining the relationship between specific OC symptoms and ARFID symptoms; however, possible explanations for their association can be proposed. For example, OC washing symptoms are primarily concerned with the fear of contamination or spreading disease, and food can perceived as a host for bacteria (Newell et al., 2010). Those with ARFID symptoms of selective eating avoid certain foods due to sensory properties, which may also be reflective of whether a food is spoilt or could cause harm. A similar explanation also applies to those who avoid food due to potential adverse consequences of eating; these individuals may engage in thorough washing of foods to prevent contamination or illness. This is also a similar pattern of behaviours that occur in emetophobia, a phobia of vomiting, whereby individuals go to extensive efforts to prevent vomiting, which can include avoidance of foods and contamination (Veale et al., 2012, 2015). The overlap between OC symptoms and concerns about food contamination or illness proposes that shared mechanisms, such as anxiety avoidance or heightened threat perception, may be implicated in the relationship between OC symptoms and ARFID.

Of note, OC obsessing and checking symptoms negatively predicted ARFID selective eating and fearing consequences of eating, respectively. A study by Levinson and colleagues (2019) also observed an inverse relationship, but for OC obsessing symptoms and purging behaviours in those with anorexia nervosa. The authors suggested this relationship may echo the cycle of obsessions and compulsions in OCD; sitting with an obsession may lead to fewer compulsive behaviours (i.e., purging) to counteract the distress caused by the obsessions, enabling the obsessive thoughts to persist. A similar explanation

could be suggested for the current study; for example, those who actively try to *not* eat selectively may subsequently have obsessional thoughts about the food they consume, or those who consistently check their food to avoid adverse consequences (e.g., food poisoning or gastrointestinal issues) may be less likely to avoid foods they previously feared. Alternatively, the debilitating and time-consuming nature of OC obsessing or checking may not permit one's attention to be diverted to other thoughts or behaviours, such as those associated with ARFID. These findings highlight the potential complexity of the relationship between OC symptoms and ARFID, which underscores the need for further research to understand whether these inverse relationships are consistently observed, or are an isolated occurrence.

Overall, the current study provides evidence to suggest that certain OC symptoms may differentially contribute towards the expression of distinct eating disorder symptoms. In particular, hoarding symptoms appeared to be specifically associated with anorexia nervosa and bulimia nervosa, whereas washing symptoms were linked to ARFID.

Limitations

There are some limitations of the study to consider. The hierarchical regressions did not meet all statistical assumptions, limiting the robustness of the study findings. However, it was not entirely unexpected that the data did not follow a normal distribution given that the study measurements assessed OC symptoms and eating disorder symptoms in a normal (i.e., non-clinical) population. Moreover, in comparison to the diverse participant sample of Chapter 3, participants of current the study were from predominantly white backgrounds, which limits the understanding of OC symptoms and eating disorder symptoms among ethnic minority groups. Research suggests that individuals from ethnic minority groups within the general population are particularly at risk of eating disorder symptoms, highlighting the need for more ethnically diverse samples (Solmi et al., 2014). Lastly, as the study adopted a cross-sectional design, it was not possible to explore the temporal relationship between eating disorder symptoms and OC symptoms which has been highlighted in previous research (Buckner et al., 2010; Hofer et al., 2018; Micali et al., 2011).

Summary and directions for future research

In summary, the study findings provide evidence for a relationship between OC symptoms and eating disorder symptoms within the general population, and not just among those with diagnosed OCD. Importantly, OC symptoms were significantly associated with these eating disorder symptoms over and above other variables that are suggested risk factors (e.g., gender). Moreover, it appeared that OC symptom subtypes may differentiate between those who experience eating disorder symptoms related to weight and shape concerns and those who exhibit symptoms of food avoidance. Together with the findings of Chapter 3, these results propose a relationship between OC symptoms and atypical eating behaviours across the continuum of severity in the general population. Given the prevalence of OCD and eating disorder symptomatology beyond clinical settings, it would be important for future research to consider how to best screen for such symptoms in those who may not seek help or fail to meet the threshold needed to obtain a clinical diagnosis. Furthermore, it would be important to examine underlying mechanisms which might explain why eating disorder symptoms occur in this group.

Chapter 5: Why do obsessive-compulsive symptoms and eating disorder symptoms co-occur in the general population?

Overview

Whilst Chapter 4 highlighted a relationship between OC symptoms and eating disorder symptoms within adults of the general population, less is known about why those demonstrating high levels of OC symptoms are at risk of these atypical eating behaviours. It is possible that factors, other than OC symptoms, may underlie these pathological eating patterns. These risk factors include perfectionism, emotion dysregulation, obsessive-compulsive personality traits, anxiety, cognitive rigidity and sensory sensitivity. This Chapter aimed to extend existing research, including that of Chapter 4, by investigating whether alternative factors may underlie the relationship between OC symptoms and eating disorder symptoms in adults from the general population.

Introduction

Risk factors associated with eating disorders and related symptoms

Existing research, as well as the findings of Chapter 4, suggest that those demonstrating elevated levels of OC symptomatology are more likely to exhibit symptoms across the spectrum of eating disorders, including anorexia nervosa, bulimia nervosa and ARFID (e.g., Barnhart et al., 2021; Vanzhula et al., 2021; Zickgraf et al., 2016, 2019). The link between OC symptoms and eating disorder symptoms may be explained by shared aetiologies, overlapping features of OCD and eating disorders, or recognised risk factors for eating disorders. Such risk factors include perfectionism, emotion regulation difficulties, anxiety, obsessive-compulsive personality traits, cognitive rigidity and sensory sensitivity, which are further described in the following subsections.

Perfectionism

Perfectionism is a multidimensional personality trait which encompasses setting excessively high standards for oneself, concerns over making mistakes and the desire for orderliness and neatness (Stöber, 1998). The high expectations of perfectionists may be intrinsically driven (e.g., personally set standards) or determined by extrinsic factors, such as perceived social or parental expectations. Perfectionism can also be understood as maladaptive or adaptive; maladaptive perfectionism, referring to concerns over mistakes, doubts about actions and parental criticisms, is associated with critical self-evaluations and concerns over external pressures, whereas adaptive perfectionism, which refers to personal standards and organisation, is said to be a more positive facet of perfectionism (Bieling et al., 2004; Leone & Wade, 2018; Lo & Abbott, 2013).

Perfectionism is a prominent feature of both eating disorders and OCD (Castro-Fornieles et al., 2007; Frost & Steketee, 1997; Maia et al., 2009), and research indicates that individuals with higher levels of perfectionism are at greater risk of developing more severe OC and eating disorder symptomatology (Bernert et al., 2013; Christian et al., 2021; Limburg et al., 2017). The Transdiagnostic Model of Eating

Disorders also recognises that clinical perfectionism, referring to striving and achieving perfectionistic standards despite adverse consequences, is core to the maintenance of eating disorders, including anorexia nervosa and bulimia nervosa (Fairburn et al., 2003).

It has been proposed that perfectionism may explain the co-occurrence of OC symptoms and eating disorder symptoms in both general and clinical populations. For example Williams and Levinson (2021) observed that maladaptive perfectionism could predict prospective OC symptoms among those with an eating disorder. Moreover, Flamarique and colleagues (2019) found that self-oriented perfectionism, defined as having exceptionally high standards for oneself, could predict both eating disorder and OC symptomatology in those with anorexia nervosa. Similar findings were also observed in the control group, where socially prescribed perfectionism, referring to perceived external pressures to be perfect, could predict both OC and eating disorder symptomatology.

Further evidence comes from Vanzhula and collegues (2021) who observed that perfectionism connected symptoms of OCD and eating disorders in those with and without a diagnosed eating disorder; for example, perfectionistic traits of repeating things over and over connected OC checking and rules around food. A study by Pollack and Forbush (2013) also suggested that perfectionism contributed towards the relationship between OC and eating disorder symptomatology as a mediating factor, whereby adults of the general population with elevated levels of OC symptoms, who displayed greater perfectionism, were more likely to restrict their diet.

Overall, whilst limited, there is evidence to suggest that that perfectionism may underlie the relationship between OC symptoms and eating disorder symptoms. However, much of the existing research has focused on eating disorders related to weight and shape concerns, rather than food avoidance. Moreover, it would also be important to examine whether the association between perfectionism, eating disorder symptoms and OC symptoms remains when considering other factors that may also underlie their relationship.

Emotion regulation

Emotion regulation refers to the ability to identify, modulate, adapt and respond to one's emotions (Campbell-Sills & Barlow, 2007; Jacob et al., 2012); it is a dimensional concept which can be both adaptive and maladaptive. Adaptive emotion regulation refers to positive reframing of thoughts, active problem solving, and awareness and acceptance of emotions, whereas maladaptive attempts to regulate emotions include rumination, avoidance and suppression (Aldao et al., 2010, 2014). Dependence on maladaptive emotion regulation can result in emotion dysregulation, which is considered a risk factor for various psychopathologies, including eating disorders, post-traumatic stress disorder and substance abuse (Bradley et al., 2011; McLaughlin et al., 2011).

Emotion dysregulation has also been linked to OC symptomatology. It has been proposed that compulsions serve as a means of regulating the emotional distress caused by obsessions, suggesting that emotion regulation enables and maintains the cycle of OC symptoms (Calkins et al., 2013). Furthermore, research indicates that individuals with OCD experience higher levels of emotion dysregulation compared to controls (e.g., Khosravani et al., 2020; Yazici & Yazici, 2019), and that difficulties in emotion regulation can predict more severe OC symptoms in those with and without diagnosed OCD (Eichholz et al., 2020; Khosravani et al., 2020; Stern et al., 2014; Yap et al., 2018).

Moreover, emotion dysregulation is considered a transdiagnostic risk factor for the development and maintenance of anorexia nervosa and bulimia nervosa (Fairburn et al., 2003; Leppanen et al., 2022; Prefit et al., 2019; Ruscitti et al., 2016; Svaldi et al., 2012), and is reported to be more severe in those with eating disorders compared to healthy controls (Anderson et al., 2018; Brockmeyer et al., 2014; Svaldi et al., 2012). Some research, however, indicates that these difficulties are more pronounced among those with eating disorders relating to bingeing (e.g., binge/purge-type anorexia nervosa, bulimia nervosa and binge eating disorder), rather than eating disorders characterised by restrictive eating (i.e., restricting type anorexia nervosa; Anderson et al., 2018; Mallorquí-Bagué et al., 2018; Weinbach et al., 2018). The relationship between emotion dysregulation and eating disorder symptoms is also observed in the general population, where those with more severe eating disorder symptoms express poorer emotion regulation (Lafrance Robinson et al., 2014; Mikhail & Kring, 2019; Monell et al., 2018).

At present, only one study has considered whether emotion regulation is implicated in the relationship between OC symptoms and eating disorder symptoms. In a general population study, Latif and Moulding (2024) observed that, although OC symptoms were associated with eating disorder symptoms concerning anorexia nervosa and bulimia nervosa, OC symptoms failed to predict eating disorder symptomatology when controlling for emotion regulation. Emotion regulation was a unique predictor of eating disorder symptomatology, alongside gender and fear of self, which refers to the concept of one fearing who they might become. Whilst studies of this nature are limited, it is possible that poorer emotion regulation is implicated in the relationship between OC symptoms and eating disorder symptoms.

Anxiety

Anxiety, which refers to experiencing distress, discomfort or threat in response to a stimulus, can be experienced as a personality trait, an emotional state, or, in severe presentations, a mental health disorder (Endler & Kocovski, 2001). There are several types of anxiety disorders which are differentiated by the presenting anxiety or concern; for example, social anxiety disorder reflects marked fears regarding social situations, whereas generalised anxiety disorder refers to chronic and persistent worries regarding a range of events or activities (APA, 2022). Until 2013, OCD was also considered an anxiety disorder by the DSM, until it was moved into a separate category called Obsessive-Compulsive and Related Disorders.

Anxiety disorders and symptoms occur alongside many mental health conditions, including eating disorders and OCD (Barakat et al., 2023; Swinbourne et al., 2012). Concerning OCD and/or OC symptoms, cognitive-behavioural models stipulate that the desire to avoid anxiety is core to maintaining the cycle of obsessions and compulsions (Foa, 2010; Taylor et al., 2012). Similarly, the Transdiagnostic Model for Eating Disorders suggests that those with an eating disorder engage in pathological eating behaviours, such as binge-eating or dietary control, in attempt to modulate intense emotional states, such as anxiety (Fairburn et al., 2003). The relationship between anxiety and eating disorder symptoms is also observed among the general population, where elevated levels of anxiety are associated with dieting related eating disorder symptoms, such as compensatory behaviours and drive for thinness (Ernst et al., 2021; Sala & Levinson, 2016).

Research also proposes that anxiety is a risk factor for the development of eating disorder symptoms. For example, a longitudinal study found that anxiety symptoms, rather than OC symptoms, during childhood were associated with the risk of developing an eating disorder in later life (Schaumberg et

al., 2019). Moreover, Lloyd and colleagues (2020) observed that having an anxiety disorder during mid to late adolescence could predict later fasting behaviours to control weight. Alternatively, other studies have suggested that anxiety may mediate the relationship between perfectionism and eating disorder symptoms among those with diagnosed eating disorders, such that those with greater levels of perfectionism, leading to elevated anxiety, are more likely to display eating disorder symptoms (Drieberg et al., 2019; Egan et al., 2013).

Research has yet to examine whether anxiety underlies the relationship between OC symptoms and eating disorder symptoms. However, given the high prevalence of anxiety among both eating disorders and OCD, as well as the established predictive effect of anxiety on atypical eating behaviours, it would be of interest to explore whether anxiety contributes to the relationship between OC symptoms and eating disorder symptoms.

Obsessive-compulsive personality traits

Obsessive-compulsive personality disorder (OCPD) is characterised by a cluster of maladaptive personality traits, including preoccupation with details, perfectionism, excessive devotion to work or productivity, the inability to discard worthless objects, over-conscientiousness, miserliness, rigidity, and stubbornness (APA, 2022). While some with OCPD may also present with OC symptoms and/or OCD, and vice versa, obsessions and compulsive behaviours are not a hallmark feature of OCPD. The presence of OCPD typically emerges around adolescence, however traits such as perfectionism are often noted during childhood (Sametoğlu et al., 2022). Both diagnosed OCPD and subthreshold OCPD symptoms are associated with poor long-term functioning (Hong et al., 2005).

Like OC symptoms, OCPD often co-occurs with eating disorders, particularly anorexia nervosa and bulimia nervosa. The prevalence of OCPD among those with an eating disorder ranges between 13% and 32% (Grilo et al., 2003; Halmi et al., 2005; Sansone et al., 2004; Strober et al., 2007). OCPD symptoms are also greater in those with an eating disorder compared to healthy controls, and have been shown to differentiate between siblings with and without an eating disorder (Anderluh et al., 2003; Degortes et al., 2014). Moreover, over 70% of those with an eating disorder are reported to display OCPD symptoms during childhood, with perfectionism and rule bound behaviours being the most frequently observed (Degortes et al., 2014; Giles et al., 2022).

Several studies have also observed that OCPD symptoms can predict eating disorder symptoms. For example, OCPD cognitions have been found to correlate with, and predict, more severe eating disorder symptomatology in those with an eating disorder (Connan et al., 2009, 2014). Moreover, childhood traits of OCPD are found to predict the presence of an eating disorder in later life, with one study suggesting that for each additional OCPD trait displayed during childhood, the risk of developing an eating disorder increases sevenfold (Anderluh et al., 2003). In a separate study by Degortes and colleagues (2014), it was observed that childhood OCPD traits were associated with an eightfold risk of developing anorexia nervosa, regardless of how many OCPD traits were present; this led the authors to suggest that OCPD traits are a precursor of anorexia nervosa, rather than a risk factor.

The co-occurrence of OCPD and OCPD symptoms in those with eating disorders, particularly anorexia nervosa, has led some researchers to suggest that eating disorders and related symptoms may be more akin to OCPD, rather than OCD (Sansone & Sansone, 2011). As individuals with eating disorders or

OCD may also exhibit traits or symptoms of OCPD, it is of interest to consider whether these traits underlie the expression of eating disorder symptoms in those with high levels of OC symptoms.

Sensory sensitivity

Sensory sensitivity refers to perceiving heightened or diminished responses to sensory stimuli in the environment; heightened responses to stimuli are referred to as hypersensitivity, whereas diminished responses refer to hyposensitivity (Elwin et al., 2013). Differences in sensory perception can lead individuals to seek or avoid certain stimuli within environment; for example, in the case of sensory hypersensitivity, this may include avoiding bright lights, noisy settings, or even certain foods (Bogdashina, 2016; Cunliffe et al., 2022; Landon et al., 2016; Simmons et al., 2009). Sensory sensitivities are commonly observed in autism spectrum disorder, where atypical eating behaviours, particularly selective eating and ARFID, are present (Bourne et al., 2022; Zickgraf et al., 2022)

Existing research has linked sensory sensitivity to eating disorder symptoms. For example, greater levels of hypersensitivity in anorexia nervosa has been associated with more severe eating disorder symptoms (Brand-Gothelf et al., 2016), greater disturbances concerning body image (Zucker et al., 2013) and lower BMI (Saure et al., 2022; Zucker et al., 2013). Sensory sensitivity also appears to be similar between those with current anorexia nervosa and those who are weight-restored or in recovery, suggesting that sensory sensitivities are a persistent feature of anorexia nervosa, rather than one which fluctuates in line with symptom severity (Brand-Gothelf et al., 2016; Merwin et al., 2013; Zucker et al., 2013). Fewer studies have examined sensory sensitivity in bulimia nervosa, however findings from Bell and colleagues (2017) observed that those with bulimia nervosa were more hypersensitive compared to those without a history of disordered eating, suggesting greater sensitivity to environmental stimuli may present across the spectrum of eating disorders.

Fewer studies have examined sensory sensitivity and eating disorder symptoms among the general population, however one study observed that adults who were hypersensitive to touch were more likely to display eating disorder symptoms relating to anorexia nervosa and bulimia nervosa (Nisticò et al., 2024). Moreover, Kauer and colleagues (2015) observed that adults who engaged in selective eating behaviours, a less severe form of ARFID, were more likely to exhibit hypersensitivity towards bitter and sweet tastes, and refuse foods due to their textural properties. The authors also found that the selective eaters displayed higher levels of OC symptoms, but this was not explored in relation to sensory sensitivity.

Sensory sensitivity is also linked OC symptomatology (Hellriegel et al., 2017), but only two studies to date have explored the effect of sensory sensitivity on atypical eating behaviours in OCD. Both of these studies specifically addressed selective eating in children with OCD, OC-spectrum disorders (e.g., trichotillomania), anxiety disorders (e.g., specific phobias or generalised anxiety disorder) and autism spectrum disorder; hence, the findings should be interpreted with this in mind. In the first study, Zickgraf and Elkins (2018) observed that sensory sensitivity mediated the relationship between anxiety and selective eating; children displaying greater levels of anxiety, who were hypersensitive towards sensory stimuli, were more likely to express selective eating behaviours. Hypersensitivity could also predict selective eating when controlling for anxiety. In the second study, Zickgraf and colleagues (2022) highlighted that hypersensitivity towards oral textures could predict selective eating when controlling for other factors, including olfactory sensitivity, age and gender. Not only were these findings observed in children with OCD, OC-spectrum disorders and anxiety disorders, but also children with autism

spectrum disorder, typically developing children and a group of students. These findings stipulated sensory sensitivity could be a universal factor for selective eating, regardless of the study population.

Overall, there is evidence to suggest that sensory sensitivity is implicated with eating disorders and non-clinical food avoidance behaviours, however, less is known about whether it contributes towards the expression of atypical eating among those with OC symptoms. The two studies carried out by Zickgraf and Elkins (2018) and Zickgraf and colleagues (2022) suggest that sensory sensitivity might be associated with selective eating in children with OCD and related disorders, however the conclusions are hindered by limited research of a similar nature and mixed participant groups. The findings are also confined to child and adolescent samples, which cannot be directly inferred to adults, where sensory sensitivity may change with age (Ueno et al., 2019).

Cognitive rigidity

Cognitive flexibility refers to the ability to adapt one's cognitive and behavioural response to changing conditions (Stalnaker et al., 2009). Inability to adapt, known as cognitive rigidity, can result in rigid routines and attention-shifting difficulties. Cognitive rigidity is a key feature of OCPD, as well as OCD; obsessions can be described as inflexible and compulsions often include rigid and routine-like behaviours (Gruner & Pittenger, 2017). Impairments in cognitive flexibility are also observed in individuals of the general population who display high levels of OC symptoms (Ramakrishnan et al., 2022; Sternheim et al., 2014).

Cognitive rigidity is considered a feature of eating disorders, particularly restrictive subtypes such as anorexia nervosa and ARFID (Rodgers et al., 2023). It is also said to differentiate between those with and without anorexia nervosa (Buzzichelli et al., 2018; Di Lodovico & Gorwood, 2020; Harrison et al., 2012), and is reported to be a persistent feature of anorexia nervosa, regardless of whether the person has acute symptoms or is in recovery (Harrison et al., 2012). A further study by Wang and colleagues (2021) observed that cognitive rigidity presented similarly across adolescents and young adults with different eating disorders, including anorexia nervosa, bulimia nervosa and other specified eating disorders, suggesting that cognitive flexibility is impaired across the spectrum of eating disorders.

There is also evidence of an association between anorexia nervosa and bulimia nervosa symptoms and cognitive rigidity in adults from the general population. For example, using self-report measures of cognitive rigidity, Chong and Martinelli (2024) and Arlt and colleagues (2016) found that cognitive rigidity was associated with greater levels of eating disorder symptoms. Additionally, Arlt and colleagues (2016) observed that cognitive rigidity could predict eating disorder symptoms when controlling for other factors, such as social anxiety. These findings suggest cognitive rigidity could be implicated with anorexia nervosa and bulimia nervosa symptoms in those with and without eating disorders.

Research has not yet explored the impact of cognitive rigidity on ARFID; however, evidence from studies of autism spectrum disorder, where atypical eating is prevalent, has highlighted the role of cognitive rigidity in food avoidance. Those with autism spectrum disorder exhibit restrictive, repetitive behaviours which can lead to fixated interests, insistence on sameness and inflexible adherence to routines (American Psychiatric Association, 2013). Such rigidity is often expressed through eating behaviours, leading to food avoidance and distinct preferences for meal presentation (Kinnaird et al., 2019; Ledford & Gast, 2006).

Preliminary evidence for the role of cognitive rigidity in food avoidance has been presented by two studies which examined selective eating, a non-clinical atypical eating behaviour that can be described as a less severe presentation of ARFID. However, both studies yielded mixed findings. In the first study, Suarez and colleagues (2014) explored whether restrictive, repetitive behaviours, a behavioural manifestation of cognitive rigidity, could predict selective eating in autistic children. Children with more restrictive, repetitive behaviours engaged in selective eating, however, restrictive, repetitive behaviours were unable to predict selective eating when controlling for sensory sensitivity. In contrast, a study by Zickgraf and colleagues (2022) observed that cognitive rigidity, when controlling for olfactory sensory sensitivity, could predict selective eating behaviours in children with anxiety, OC spectrum disorders or OCD, children with autism spectrum disorder, typically developing children and students. Unlike the findings observed by Suarez and colleagues (2014), cognitive rigidity had a significant effect on selective eating in multiple participant groups, independent of sensory sensitivity. However, due to the paucity of existing studies, further research would be needed to better understand the role of cognitive rigidity in atypical eating behaviours.

Current study and aims

There are several risk factors for eating disorder symptoms. However, other than perfectionism, very few studies have examined why adults with OC symptoms in the general population are at risk of such pathological eating patterns. Moreover, less is known about risk factors for ARFID symptoms. The current study aimed to extend the findings of Chapter 4, which observed an association between OC symptoms and eating disorder symptoms, by examining why this relationship may exist in the general population. Mediational analyses were used to examine the relationship between OC symptoms and eating disorder symptoms, alongside six potential mediators: perfectionism, emotion regulation, OCPD traits, anxiety, sensory sensitivity and cognitive rigidity. These potential mediators were included as existing research has observed them to be risk factors for eating disorders and/or symptoms, as well as shared characteristics of OCD and eating disorders. Hypotheses remained exploratory due to the paucity of existing research exploring the nature of the relationship between OC symptoms and eating disorder symptoms in the general population.

Methods

Ethical approval, participants and procedure

Ethical approvals, participants and the study procedure were the same as the study presented in Chapter 4.

Measures

Demographics, obsessive-compulsive symptoms and atypical eating behaviours

Participants were asked to report demographic information and complete measures of OC symptoms (OCI-R) and atypical eating (EAT-26 and NIAS). These measures used are outlined in Chapter 4.

Potential mediators of food avoidance

Perfectionism

Perfectionism was assessed using the self-report Frost Multidimensional Perfectionism Scale (FMPS; Stöber, 1998). The questionnaire has 35 items across four subscales which reflect four facets of perfectionism: concerns over mistakes and doubts about actions (FMPS-CMD), parental expectations and criticism (FMPS-PEC), personal standards (FMPS-PS) and organisation (FMPS-O). Example items include *'as a child I was punished for doing things less than perfectly'* (FMPS-PEC) and *'if I fail at work/school, I am a failure as a person'* (FMPS-CMD). Participants are required to indicate their level of agreement for each item on a five-point scale, ranging from *'1 – Strongly Disagree'* to *'5 – Strongly Agree'.* An overall perfectionism score is computed by totalling each of the subscales, except FMPS-O. Total perfectionism scores range between 29 and 155, with higher scores indicating greater perfectionism. Subscale scores can also be obtained by totalling corresponding items. Stöber (1998) observed good internal reliability for each of the subscales: FMPS-CMD (a =.88), FMPS-PEC (a =.89), FMPS-PS (a =.78) and FMPS-O (a =.86). Similar findings were observed in the present study; the FMPS-CMD (α = .931), FMPS-PEC (α = .934) and FMPS-O (α = .922) subscales had excellent internal reliability, and the FMPS-PS subscale (α = .862) had good internal reliability. The total FMPS score was used in the analyses.

Emotion regulation

Emotion regulation was measured using the brief version of the Difficulties in Emotion Regulation Scale (DERS-18;Victor & Klonsky, 2016). The measure includes 18 items and six subscales which assess different aspects of emotion regulation: awareness of emotions (DERS-A), clarity of emotions (DERS-C), the ability to focus on goals when experiencing negative emotions (DERS-G), impulse control when upset (DERS-I), nonacceptance of emotions (DERS-N) and negative strategies used to cope when upset (DERS-S). Example items include *'I have difficulty making sense out of my emotions'* (DERS-C), '*when I am upset, I become out of control'* (DERS-I) and *'when I am upset, I feel guilty for feeling that way'* (DERS-N). Participants are asked to report how much of the time they experience each item using a five-point Likert scale ranging between *'1 – Almost Never'* and *'5 – Almost Always'.* Subscale scores are computed by summing corresponding items, and total DERS-18 scores are obtained by totalling all subscale scores. Subscale scores range between 1 and 15, and total scores may fall between 18 and 90; greater scores indicate more difficulties in regulating emotions. Development of the DERS-18 indicated that reliability coefficients ranged between α = .77 to α = .90, suggesting acceptable to excellent internal reliability (Victor & Klonsky, 2016). In the current study, the DERS-A (α = .807), DERS-C (α = .867) and DERS-S (α = .864) had good internal reliability, and the subscales of DERS-G (α = .939), DERS-I (α = .926) and DERS-N (α = .928) had excellent internal reliability. Total DERS-18 scores were used in the current study.

Obsessive-compulsive personality disorder traits

OCPD traits were assessed using the self-rated version of the Compulsive Personality Assessment Scale (CPAS; Fineberg et al., 2015). The tool contains eight items which refer to traits observed in OCPD

(preoccupation with details, perfectionism, workaholism, over-conscientiousness, hoarding, need for control, miserliness and rigidity). Example items include '*do you see money as something to be hoarded for future catastrophes?'* (miserliness) and *'are you reluctant to delegate tasks or to work with others unless they submit to exactly your way of doing things?'* (need for control). Participants are asked to report how severe they perceive each of these traits to be for themselves on a scale ranging *between '0 – absent'* to *'4 – very severe'*. Scores are then summed to provide an overall obsessive-compulsive personality score, ranging between 0 and 32; higher scores indicate a greater presence of OCPD traits. In the current study, good internal reliability was observed (α = .857).

Anxiety

Anxiety symptoms were assessed using the Generalised Anxiety Disorder Assessment (GAD;7 Spitzer et al., 2006). The scale contains seven items which refer to anxiety-related issues, such as *'feeling anxious, nervous or on edge'* and *'worrying too much about different things'*. Participants are asked to indicate how often they have been bothered by these issues over the last two weeks on a four-point scale ranging between *'0 – not at all'* to *'3 – everyday'*. All seven items are summed to provide an overall anxiety score, which ranges between 0 and 21. Higher scores suggest greater anxiety symptoms. Developers of the scale reported excellent internal reliability (α = .92; Spitzer et al., 2006), with similar reliability coefficients observed in the current study (α = .926).

Sensory sensitivity

Sensory sensitivity was assessed using the shortened 35-item version of The Sensory Perception Quotient (SPQ-35; Tavassoli et al., 2014). The scale is separated into five subscales to assess sensitivity towards touch (SPQ-touch), taste (SPQ-taste), smell (SPQ-smell), sound (SPQ-sound) and visual stimuli (SPQ-vision). Participants respond to each item on a four-point scale ranging between *'0 – Strongly Agree'* and *'3 – Strongly Disagree'*. Example items include '*I notice the flickering of a desktop computer even when it is working properly'* (SPQ-vision) and *'I can hear electricity humming in the walls'* (SPQ-sound). All items are summed to obtain a general sensitivity score, which can range between 0 and 140; lower scores suggest greater hypersensitivity and higher scores denote greater hyposensitivity. Subscale scores may also be totalled to provide a sensitivity level for each sensory domain. Excellent internal reliability was observed in the development of the scale, with Cronbach's alpha coefficients of .93. In the present study, internal reliability was acceptable for all subscales (SPQ-smell α = .794; SPQ-vision α = .745; SPQ-touch α = .791; SPQ-hearing α = .714), except SPQ-taste (α = .546) which had poor internal reliability. Total SPQ-35 scores were used in the current analyses.

Cognitive rigidity

The Attention Switching subscale of the Autism Spectrum Quotient (AQ-AS) was used to assess cognitive rigidity (Woodbury-Smith et al., 2005). The scale contains ten items in which participants indicate their level of agreement on a four-point scale ranging from *'Definitely Agree'* to *'Definitely Disagree'*. Example items include *'I prefer to do things the same way over and over again'* and *'it does not upset me if my daily routine is disturbed'* (reversed item). The scale adopts a dichotomized scoring system, whereby *'Definitely Agree'* or *'Slightly Agree'* are scored as 1, and *'Slightly Disagree'* or *'Definitely Disagree'* are scored as 0. Scores are reversed where appropriate and summed to provide a

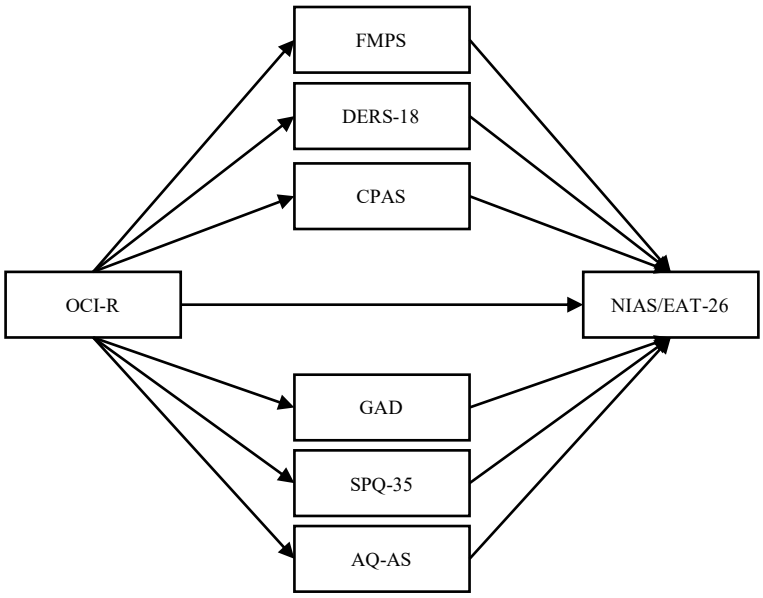
total score, ranging between 0 and 10. Higher scores denote greater cognitive rigidity. Within a group of typically developing individuals, the AQ-AS demonstrated poor reliability (α = .56; Broadbent et al., 2013). Internal reliability of the AQ-AS was questionable in the present study as determined by a Cronbach's alpha coefficient of α = .685.

Statistical analysis

Analyses were conducted using SPSS IBM Version 29 (SPSS Inc., Chicago, IL, USA). To examine predictors of eating disorder symptoms, a series of linear regressions were carried out with each potential risk factor (FMPS, DERS-18, CPAS, GAD, SPQ-35, AQ-AS) included as an independent predictor of the NIAS and EAT-26 total and subscale scores. Thereafter, a series of mediation analyses were carried out, following the guidance of Hayes (2022) to examine whether relationships between total OCI-R scores and the NIAS and EAT-26 total and subscale scores could be explained by the six alternative variables. The bootstrapping method of model 4 of the PROCESS macro and 10,000 repetitions were used to conduct the mediation analysis, and each of the potential mediators were entered in parallel. A significant indirect effect of the alternative variables would suggest the variable has a mediating role in the relationship between OC symptoms and eating disorder symptoms, whereas a direct effect of OC symptoms on the eating disorder symptoms would suggest that OC symptoms are associated with eating disorder symptoms regardless of the alternative variables. In cases where there is both a significant indirect and direct effect, this would suggest that OC symptoms have a direct effect on the eating disorder symptoms and that a mediation has also occurred (a partial mediation). Assessing the significance of the indirect effects is determined by looking at lower limit confidence intervals (LLCI) and upper limit confidence intervals (UCLI); if either the LLCI or UCLI crosses 0, the indirect effect is insignificant, however if the LLCI or UCLI both remain above or below 0, the indirect effect is considered significant. Figure 5.1 presents a theoretical diagram of the potential mediational relationship.

Fig. 5.1.

Theoretical diagram of the potential mediational relationship between OC symptoms and eating disorder symptoms



Results

Sample statistics

Full details relating to the sample statistics can be found in Chapter 4. Sample means for the current study are presented in Table 5.1.

Table 5.1.
Sample means for study variables

Study variable	*M* (*SD*)
OCI-R total	18.60 *(12.83)*
Eating disorder symptoms	
NIAS-SE	3.91 *(3.73)*
NIAS-A	2.64 *(3.19)*
NIAS-F	1.81 *(2.77)*
NIAS total	8.36 *(7.76)*
EAT-D	5.83 *(7.08)*
EAT-BF	1.80 *(3.15)*
EAT-OC	1.43 *(2.33)*
EAT-26 total	9.06 *(10.51)*
Potential mediators	
FMPS total	86.22 *(20.31)*
DERS-18 total	43.25 *(13.84)*
CPAS	9.82 *(6.43)*
GAD-7	7.42 *(5.58)*
SPQ-35 total	49.09 *(14.37)*
AQ-AS	5.63 *(2.39)*

Note: OCI-R total = Obsessive-compulsive Inventory – Revised total score; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; EAT-26 total = Eating Attitudes Test – 26 item total score; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

Study variables as predictors of eating behaviours

A series of linear regressions were carried out to explore whether each of the six alternative variables could predict eating disorder symptoms. Regression analyses for OCI-R scores predicting the eating disorder symptoms are displayed in Chapter 4.

The study variables were examined for normality of distribution using the Shapiro-Wilk Test. Neither the eating disorder symptoms nor the predictor variables had a normal distribution. Weak to moderate correlations were observed between some of the predictor and dependent variables, however some

shared no significant correlation. Inspection of Probability Plots suggested abnormality of the residuals for the NIAS-F and EAT-26 total and subscale scores. Standard residuals were between -1.772 to 5.213, indicating that whilst most cases were within an acceptable range, some data points substantially deviated from predicted values. However, Cook's Distance remained below 1, suggesting that no individual cases affected the models.

As shown in Table 5.2, the NIAS total and subscale scores could be predicted by at least one of the mediators. The NIAS-SE was predicted only by the FMPS. All the alternative variables, except the AQ-AS, could predict NIAS-A scores. The NIAS-F was predicted by the CPAS and lastly, the NIAS total scores were predicted by the FMPS, GAD-7, CPAS and SPQ-35. Increases in the FMPS, DERS-18, GAD-7 and CPAS resulted in increases in each of the corresponding eating disorder symptoms. Decreases in the SPQ-35, indicating greater hypersensitivity, was associated with greater presence of the corresponding eating disorder symptoms.

Table 5.2.
Summary of linear regressions for potential mediators predicting the NIAS

	β	R^2	*F*	*p*
NIAS-SE				
FMPS	**.161***	.026	4.355	**.039**
DERS-18	.055	.003	.506	.478
GAD-7	.058	.003	.546	.461
CPAS	.144	.021	3.450	.065
SPQ-35	-.132	.017	2.887	.091
AQ-AS	.102	.010	1.747	.188
NIAS-A				
FMPS	**.172***	.029	4.948	**.028**
DERS-18	**.174***	.030	5.131	**.025**
GAD-7	**.239****	.057	9.889	**.002**
CPAS	**.232****	.054	9.245	**.003**
SPQ-35	**-.296*****	.088	15.772	**<.001**
AQ-AS	.093	.009	1.449	.230
NIAS-F				
FMPS	.143	.021	3.413	.066
DERS-18	.080	.006	1.065	.304
GAD-7	.113	.013	2.114	.148
CPAS	**.202****	.041	6.923	**.009**
SPQ-35	-.152	.023	3.871	.051
AQ-AS	.046	.002	.347	.557
NIAS total				
FMPS	**.199****	.040	6.738	**.010**
DERS-18	.127	.016	2.683	.103
GAD-7	**.167***	.028	4.655	**.032**
CPAS	**.238****	.051	9.689	**.002**
SPQ-35	**-.239****	.057	9.943	**.002**
AQ-AS	.104	.011	1.798	.182

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

A summary of the linear regression analyses conducted on the EAT-26 is presented in Table 5.3. EAT-D, EAT-BF and EAT-26 total scores were predicted by all the alternative variables, except for the AQ-AS. EAT-OC scores were predicted by the FMPS, CPAS and SPQ-35. As with the linear regressions predicting NIAS scores, increases in FMPS, DERS-18, GAD-7 and CPAS resulted in greater EAT-26 scores; decreases in the SPQ-35, indicating greater hypersensitivity, predicted higher EAT-26 scores.

Table 5.3.
Summary of linear regressions for potential mediators predicting the EAT-26

	β	R^2	*F*	*p*
EAT-D				
FMPS	**.410*** **	.168	32.975	**<.001**
DERS-18	**.321*** **	.103	18.800	**<.001**
GAD-7	**.237** **	.056	9.726	**.002**
CPAS	**.406*** **	.165	32.065	**<.001**
SPQ-35	**-.352*** **	12.4	23.164	**<.001**
AQ-AS	.132	.018	2.926	.089
EAT-BF				
FMPS	**.299*** **	.089	15.952	**<.001**
DERS-18	**.319*** **	.101	18.520	**<.001**
GAD-7	**.206** **	.043	7.245	**.008**
CPAS	**.244** **	.059	10.229	**.002**
SPQ-35	**-.237** **	.056	9.741	**.002**
AQ-AS	.125	.016	2.608	.108
EAT-OC				
FMPS	.168	.028	4.749	**.031**
DERS-18	.032	.001	.173	.678
GAD-7	.085	.007	1.175	.280
CPAS	**.192***	.037	6.219	**.014**
SPQ-35	**-.283*** **	.080	14.308	**<.001**
AQ-AS	.083	.007	1.151	.285
EAT-26 total				
FMPS	**.403*** **	.162	31.603	**<.001**
DERS-18	**.319*** **	.101	18.520	**<.001**
GAD-7	**.240** **	.058	9.994	**.002**
CPAS	**.389*** **	.152	28.993	**<.001**
SPQ-35	**-.371*** **	13.7	16.121	**<.001**
AQ-AS	.145	.021	3.529	.062

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; EAT-26 total = Eating Attitudes Test – 26 item total score; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

Mediation analyses

A series of mediation analyses were carried out to explore whether the relationship between OCI-R total and the NIAS and EAT-26 total and subscale scores were mediated by alternative variables. Each mediation analysis was conducted with the potential mediators in parallel.

Firstly, assumption testing was carried out. As described earlier, neither the eating disorder symptoms nor the predictor variables had a normal distribution. OCI-R scores correlated with each of the eating disorder symptoms, except the NIAS-SE. There was no evidence of multicollinearity between OCI-R scores and the predictor variables, with all tolerance values exceeding .3 and VIF values remaining below 2.6 (see table 5.4). Although P-Plots suggested the deviations from normality in the residuals and standard deviations exceed 3 in most cases, no individual cases appeared to affect the mediations with Cook's Distance values remaining below 1.

Table 5.4.
Tolerance and VIF values across the mediators

Mediator	Tolerance	VIF
OCI-R total	.396	2.528
FMPS	.497	2.010
DERS-18	.458	2.184
CPAS	.419	2.387
GAD-7	.417	2.396
SPQ-35	.696	1.436
AQ-AS	.780	1.281

Note: OCI-R total = Obsessive-compulsive Inventory – Revised total score; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

Mediation analyses for NIAS

Regarding the NIAS-A, there was a significant indirect effect of OCI-R total scores through the SPQ-35 (β = .1110, LLCI-UCLI = 0272 - .1955), indicating that that SPQ-35 mediated the relationship between the OCI-R and the NIAS-A. This suggests that those with greater OC symptoms and lower sensory sensitivity were more likely to have ARFID symptoms related to poor appetite.

A mediation was not observed between the OCI-R and the NIAS-F; however, the OCI-R total had a direct effect (β = .0631, p = .0196), suggesting that the OCI-R could predict ARFID symptoms associated with the fear of eating irrespective of the mediators.

The total effect model for the NIAS total scores was significant, however a mediation was not observed, and the OCI-R did not have a direct effect on NIAS total scores. These findings suggest that the OCI-R could predict overall ARFID scores, without accounting for the mediators. A mediation summary is presented in Table 5.5.

Table 5.5.

Mediation analysis summary for the NIAS

	Total effect OCI-R total → NIAS Coeff. *(p)*	**Direct effect** OCI-R total → NIAS Coeff. *(p)*	**Relationship** OCI-R → potential mediators → NIAS	**Indirect effect** Coeff. (95% LLCI-ULCI)		**Conclusion**
NIAS-SE	.0305 (.1889)	.0106 (.7742)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → NIAS-SE	FMPS	.0612 (-.0369 - .1624)	Total effect model non-significant No direct effect of OCI-R No mediation observed
				DERS-18	-.0240 (-.1683 - .1270)	
				CPAS	.0250 (-.1415 - .1880)	
				GAD	-.0373 (-.1928 - .1132)	
				SPQ-35	.0262 (-.0733 - .1201)	
				AQ-AS	.0161 (-.0496 - .0907)	
NIAS-A	**.0691 (.0004)**	.0199 (.5081)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → NIAS-A	FMPS	-.0097 (-.1060 - .0799)	**Total effect model is significant** No direct effect of OCI-R **Full mediation observed (SPQ-35)**
				DERS-18	-.0151 (-.1460 - .1323)	
				CPAS	.0273 (-.1180 - .1829)	
				GAD	.1051 (-.0536 - .2581)	
				SPQ-35	**.1110 (.0272 - .1955)**	
				AQ-AS	-.0236 (-.0872 - .0385)	
NIAS-F	**.0552 (.0012)**	**.0631 (.0196)**	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → NIAS-F	FMPS	-.0317 (-.0525 - .1096)	**Total effect model is significant** **Direct effect of OCI-R** No mediation observed
				DERS-18	-.0597 (-.1838 - .0809)	
				CPAS	.0453 (-.0911 - .2018)	
				GAD	-.0305 (-.1642 -.1213)	
				SPQ-35	.0028 (-.0879 - .0911)	
				AQ-AS	-.2060 (-.0955 - .0374)	
NIAS total	**.1547 (.0011)**	.0936 (.2099)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → NIAS total	FMPS	.0368 (-.0551 - .1205)	**Total effect model is significant** No direct effect of OCI-R No mediation observed
				DERS-18	-.0391 (-.1656 - .1065)	
				CPAS	.0395 (-.1080 - .1920)	
				GAD	.0143 (-.1277 - .1627)	
				SPQ-35	.0593 (-.0245 - .1453)	
				AQ-AS	-.0112 (-.0784 - .0571)	

Note: Items in bold represent a significant effect

NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; NIAS-SE = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

Mediation analyses for EAT-26

There was a significant indirect effect of the OCI-R on EAT-D scores through the FMPS (β = .1077, LLCI-UCLI = .0250 - .2025), indicating that the relationship between the OCI-R and EAT-D was fully mediated by the FMPS. Therefore, those with elevated OC symptoms and perfectionistic tendencies were more likely to engage in anorexia nervosa and bulimia nervosa symptoms concerning dieting.

A significant indirect effect of the OCI-R on the EAT-BF through the DERS-18 was observed (β = .1674, LLCI-UCLI = .0271 - .2957), suggesting that the DERS-18 fully mediated the relationship between the OCI-R and EAT-D. Individuals with elevated OC symptoms and poorer emotion regulation were more likely to exhibit symptoms related to bulimia and food preoccupation.

The OCI-R had a direct effect on the EAT-OC (β = .0549, *p*= .0134) and an indirect effect on the EAT-OC through the DERS-18 (β = -.1170, LLCI-UCLI = -.2433 - -.0032), which suggests the DERS-18 partially mediated the relationship between OC symptoms and EAT-OC. Those with greater OC symptoms and poorer emotion regulation were more likely to display oral control symptoms; OC symptoms also influenced this type of eating behaviour when controlling for the mediators.

Lastly, an indirect effect of the OCI-R on EAT-26 total scores through the FMPS was observed (β = .1008, LLCI-UCLI = .0268 -.2044), indicating that the FMPS fully mediated the relationship between the OCI-R and the EAT-26 total scores. These findings suggested those with greater OC symptoms, as well as more perfectionistic traits, were more likely to engage in general anorexia nervosa and bulimia nervosa eating disorder symptoms. A mediation summary is presented in Table 5.6.

Summary of mediation analyses

Several mediation effects were observed for NIAS and EAT-26 scores, suggesting that other variables may underpin their association with OC symptoms. The relationship between OC symptoms and ARFID symptoms related to poor appetite was entirely explained by lower sensory sensitivity. Concerning mediators for the EAT-26, perfectionism explained the relationship between OC symptoms and dieting and overall anorexia nervosa and bulimia nervosa symptoms. Poorer emotion regulation also explained the relationship between OC symptoms and bulimic and food preoccupation symptoms.

Whilst some mediations explained the relationship between OC symptoms and certain eating disorder symptoms, it was apparent that OC symptoms had a direct influence on oral control (EAT-OC) and fearing the consequences of eating (NIAS-F), irrespective of the mediators.

Table 5.6.

Mediation analysis summary for the EAT-26

	Total effect model OCI-R total → EAT-26 Coeff. *(p)*	**Direct effect of OCI-R** OCI-R total → EAT-26 Coeff. *(p)*	**Mediational Relationship** OCI-R → potential mediators → EAT-26	**Indirect effect** Coeff. (95% LLCI-ULCI)		**Conclusion**
EAT-D	**.1915 (<.001)**	.0412 (.5014)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → EAT-D	**FMPS**	**.1077 (.0250 - .2025)**	**Total effect model is significant** No direct effect of OCI-R **Full mediation observed (FMPS)**
				DERS-18	.1137 (-.0243 - .2590)	
				CPAS	.0931 (-.0623 - .2433)	
				GAD	-.0920 (-.2294 - .0493)	
				SPQ-35	.0881 (-.0060 - .1759)	
				AQ-AS	-.0426 (-.1064 - .0148)	
EAT-BF	**.0593 (.0022)**	.0013 (.9654)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → EAT-BF	FMPS	.0790 (-.0200 - .1843)	**Total effect model is significant** No direct effect of OCI-R **Full mediation observed (DERS-18)**
				DERS-18	**.1674 (.0271 - .2957)**	
				CPAS	-.0034 (-.1729 - .1542)	
				GAD	-.0593 (-.1800 - .0742)	
				SPQ-35	.0677 (-.0374 - .1695)	
				AQ-AS	-.0189 (-.0750 - .0436)	
EAT-OC	**.0489 (.0006)**	**.0549 (.0134)**	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → EAT-OC	FMPS	.0570 (-.0316 - .1359)	**Total effect model is significant Direct effect of OCI-R Partial mediation observed (DERS-18)**
				DERS-18	**-.1170 (-.2433 - -.0032)**	
				CPAS	-.0176 (-.1740 - .1400)	
				GAD	-.0288 (-.1459 - .1076)	
				SPQ-35	.0806 (-.0128 - .1651)	
				AQ-AS	-.0066 (-.0816 - .0609)	
EAT-26 total	**.2998 (<.001)**	.0974 (.2861)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / AQ-AS → EAT-26 total	**FMPS**	**.1088 (.0268 - .2044)**	**Total effect model is significant** No direct effect of OCI-R **Full mediation observed (FMPS)**
				DERS-18	.1007 (-.0364 - .2440)	
				CPAS	.0577 (-.0850 - .1982)	
				GAD	-.0861 (-.2143 - .0617)	
				SPQ-35	.0975 (-.0018 - .1878)	
				AQ-AS	-.0358 (-.1005 - .0247)	

Note: Items in bold represent a significant effect

OCI-R total = Obsessive-compulsive Inventory – Revised total score; EAT-26 total = Eating Attitudes Test – 26 item total score; EAT-D = EAT-26 dieting subscale; EAT-BF = EAT-26 bulimia and food preoccupation subscale; EAT-OC = EAT-26 oral control subscale; FMPS total = Frost Multidimensional Perfectionism total score; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; AQ-AS = Autism Spectrum Quotient – Attention Switching subscale.

Discussion

Study aim summary

The current study aimed to explore whether perfectionism, emotion regulation, anxiety, OCPD traits, sensory sensitivity and cognitive rigidity could explain the relationship between OC symptoms and eating disorder symptoms in adults from the general population. Given the paucity of existing research, hypotheses for the study remained exploratory.

OC symptoms and anorexia nervosa and bulimia nervosa symptoms

The relationships between OC symptoms and anorexia nervosa and bulimia nervosa eating disorder symptoms were significantly mediated by perfectionism and emotion dysregulation. Those with elevated levels of OC symptoms, who displayed increased levels of perfectionism, were more likely to engage in dieting behaviours (i.e., avoid fattening foods and be preoccupied with a desire to be thinner; EAT-D) and present with more severe overall anorexia nervosa and bulimia nervosa symptoms (EAT-26 total).

Earlier studies have also highlighted that perfectionism contributes towards the relationship between OC symptoms and symptoms relating to anorexia nervosa and bulimia nervosa in both clinical (Bernert et al., 2013; Flamarique et al., 2019; Williams & Levinson, 2021) and non-clinical populations (Pollack & Forbush, 2013; Vanzhula et al., 2021), emphasising that perfectionism is an important risk factor for eating disorder symptoms across the continuum of severity. In particular, the current study supports the findings of Pollack and Forbush (2013), who reported that perfectionism mediated the relationship between OC symptoms and dietary restraint.

Moreover, the current study suggested that individuals with more severe OC symptoms, who had a poorer ability to regulate emotions, experienced greater eating disorder symptoms relating to bulimia and food preoccupation (EAT-BF) and oral control (EAT-OC). These findings suggest that emotion regulation, in addition to perfectionism, may be the reason for the increased risk of eating disorder symptoms among those demonstrating high levels of OC symptoms in the general population. However, the relationship between OC symptoms and oral control was only partially mediated by emotional regulation, suggesting that OC symptoms may be particularly associated with eating behaviours reflecting rigidity and control.

Although research has observed that emotion regulation is associated with eating disorder symptoms, only one study has explored its role in the relationship between OC symptoms and eating disorder symptoms. Latif and Moulding (2024) observed that OC symptoms could not predict eating disorder symptoms when controlling for emotion regulation. The current study extended these findings to suggest that emotion regulation may also mediate the relationship between OC symptoms and eating disorder symptoms related to oral control, bulimia and food preoccupation.

The finding that perfectionism and emotion regulation may be implicated in eating disorder and OC symptomatology aligns with the Transdiagnostic Model of Eating Disorders, which suggests that a cluster of cognitive thought processes are associated with the development and maintenance of eating disorders (Fairburn et al., 2003). Given that emotion regulation and perfectionism explained the

relationship between OC symptoms and eating disorder symptoms, OC symptoms alone may not exacerbate the risk of eating disorder symptoms. Rather, it appears that OC symptoms may contribute toward the risk of atypical eating behaviours through transdiagnostic risk factors associated with anorexia nervosa and bulimia nervosa.

In the current study, perfectionism and emotion regulation also appeared to differentiate between the types of eating disorder symptoms expressed by those with OC symptoms; those with greater levels of perfectionism were more likely to have more severe overall eating disorder symptoms, as well as dieting behaviours, whereas those with poorer emotion regulation displayed more severe symptoms relating to bulimia, food preoccupation and oral control. Of note, poorer emotion regulation was associated with eating behaviours varying in compulsivity and impulsivity; oral control symptoms are typically considered compulsive, whereas bulimic symptoms can be described as both impulsive and compulsive (Hollander et al. 2005). Subsequently, those displaying high levels of OC symptoms and emotion dysregulation might use either impulsive or compulsive eating behaviours as a method to regulate their emotions. Conceptually, this aligns with existing research which suggests that those with OCD also display elevated levels of impulsivity, rather than compulsivity alone (Boisseau et al., 2012; Grassi et al., 2015; Prochazkova et al., 2018; Sahmelikoglu Onur et al., 2016).

These findings provide insight as to why OC symptoms and eating disorder symptoms co-occur in the general population. Individuals who display high levels of OC symptoms, alongside perfectionism and emotion regulation, appear to be at greater risk of anorexia nervosa and bulimia nervosa eating disorder symptoms. Although there is a clear need for longitudinal to understand how such symptoms present or interact over time, earlier identification of these susceptibilities may help to prevent eating disorder symptoms from occurring in individuals with elevated OC symptoms.

OC symptoms and ARFID symptoms

This was the first study to examine whether the association between OC symptoms and ARFID eating disorder symptoms in the general population could be explained by alternative factors. Findings indicated that the relationship between OC symptoms and ARFID symptoms associated with a lack of appetite may be underpinned by that sensory sensitivity; those displaying elevated levels of OC symptoms, who were less sensitive to sensory stimuli, indicating hyposensitivity, were more likely to avoid food due to a lack of appetite. These findings provide insight into a potential mechanism which drives food avoidance, particularly concerning a lack of appetite, in adults from the general population who display OC symptoms.

Existing research has not examined whether sensory sensitivity underlies the relationship between OC symptoms and ARFID. However, two previous studies observed that sensory *hypersensitivity*, rather than *hyposensitivity*, contributed towards selective eating (i.e., non-clinical food avoidance) in children with OCD, OC spectrum disorders and autism spectrum disorder, as well as typically developing children and college students (Zickgraf et al., 2022; Zickgraf & Elkins, 2018). It could be that hypersensitivity is associated with selective eating (non-clinical food avoidance), but not with ARFID (clinical food avoidance). Albeit, the findings of the two existing studies cannot be directly compared to the present study due to the mixed participant groups, participant ages and the eating behaviours explored (i.e., clinical and non-clinical food avoidance). Moreover, sensory hypersensitivity appears to decrease with age (Ueno et al., 2019), which may reflect the findings of the current study, which consisted of adults from the general population.

It is unclear why reduced hypersensitivity to external stimuli may be linked to poorer appetite among those with OC symptoms. One possibility is that greater hyposensitivity to external stimuli may also be indicative of hyposensitivity towards interoception, which refers to the ability to perceive bodily signals, such as hunger. Research has highlighted that sensory sensitivity towards external stimuli is associated with increased sensitivity to the perception of internal bodily signals (Ujiie & Takahashi, 2024). It could be proposed that those with OC symptoms, who experience hyposensitivity, may also be less receptive to their internal bodily cues for hunger, which warrants further investigation utilising measures of interoception.

A distinct pattern also emerged between OC symptoms and ARFID symptoms concerned with food avoidance due to aversive consequences associated with eating. Here, OC symptoms had a direct effect on this subtype of ARFID, even when controlling for the alternative factors, providing further evidence for a distinct pathway between OC symptoms and food avoidance. This subtype of ARFID may be the most akin to the cycle of obsessive and compulsive behaviours as it refers to the compulsive avoidance of foods due to the perceived negative consequences of eating (e.g., vomiting or discomfort). The overlap in symptomatology and direct association between OC symptoms and this subtype of food avoidance merits further exploration.

These findings are the first of their kind to potentially explain why a relationship between OC symptoms and ARFID exists in the general population. Specifically, those with OC symptoms and sensory hyposensitivity may be more likely to avoid foods due to a poor appetite. Moreover, the findings suggest that OC symptoms may have a unique association with the avoidance of food due to adverse consequences of eating, suggesting a potential pathway between OC symptomatology and facets of food avoidance.

Limitations

There are some limitations of the study to consider when interpreting the findings. Although self-report questionnaires were appropriate for the study design, some variables may have been better assessed through objective means. For example, self-report measures of executive functioning, including cognitive rigidity, are generally considered less accurate than objective tasks (Howlett et al., 2021, 2023). Consequently, the AQ-AS used in the current study may not have been the most appropriate measure of cognitive rigidity. Additionally, the study adopted a cross-sectional design, which limits the understanding of how OC symptoms and eating disorder risk factors interact over time.

Summary and directions for future research

In summary, the present study extended the findings of Chapter 4 to suggest that, for the most part, OC symptoms alone may not increase the risk for certain types of eating disorder symptoms in the general population. Rather, it can be proposed that a combination of OC symptoms and other factors, such as sensory sensitivity, emotion regulation and perfectionism, may contribute to the expression of eating disorder symptoms. Moreover, certain mediating factors may differentiate between the eating disorder symptoms expressed by those with high levels of OC symptoms. For example, individuals with reduced sensory sensitivities may avoid food due to a poor appetite, whereas those with perfectionistic traits and poorer emotion regulation may engage in eating behaviours associated with anorexia nervosa and

bulimia nervosa. Future research should explore whether a similar pattern exists among those with diagnosed OCD and examine how this pattern manifests longitudinally.

Section I Summary

Section I aimed to characterise the presence of atypical eating behaviours across the continuum of severity, and to understand why atypical eating behaviours occur among adults in the general population who display OC symptoms. Chapters 3 and 4 observed that individuals with greater levels of OC symptomatology were more likely to express atypical eating behaviours, including selective eating and a broad range of eating disorder symptoms, reflecting anorexia nervosa, bulimia nervosa and ARFID. These findings broaden existing research, which indicates an association between OC symptoms and eating disorder symptoms concerned with dieting (i.e., anorexia nervosa and bulimia nervosa), by highlighting that OC symptoms in the general population are also linked to clinical levels of food avoidance (i.e., ARFID), as well as atypical eating behaviours that fall below diagnostic thresholds.

Chapter 5 expanded on the findings of Chapters 3 and 4 to suggest that eating disorder symptoms expressed by those with OC symptoms may occur due to the presence of other factors, including perfectionism, emotion dysregulation and reduced sensory sensitivity. Together, these results suggest that a combination of OC symptoms and these underlying vulnerabilities may contribute to the expression of eating disorder symptoms in adults of the general population.

In summary, Section I highlights that a broad spectrum of atypical eating behaviours are linked to OC symptomatology through shared cognitive, emotional and sensory processes. However, it is important to acknowledge that distinct eating patterns, for example those relating to ARFID, may share a unique relationship with OC symptoms. The following section of this thesis extends the exploration of atypical eating to include those from the clinical OCD population, incorporating the perspectives of those diagnosed with OCD, as well as healthcare professionals.

Section II:
Atypical eating in the OCD population

Chapter 6: Atypical eating behaviours in participants with OCD

Overview

OCD and eating disorders are recognised to co-occur, however less is known about the relationship between OC symptoms and eating disorders in adults with OCD, and why those with OCD are more prone to such eating pathologies. In addition, some research has questioned whether those with OCD experience more atypical eating behaviours compared to controls. To address atypical eating in OCD, Chapter 6 describes a study which was carried out in two parts: Part I compares differences in atypical eating behaviours between participants with OCD and age- and gender-matched controls, and Part II examines why adults with OCD might be at greater risk of atypical eating behaviours.

Part I: A comparison of atypical eating behaviours between adults with OCD and controls

Introduction

As previously highlighted in the earlier chapters, there is high co-occurrence between OCD and eating disorders (Roberts et al., 2011; Simpson et al., 2013). OCD and OC symptoms are associated with all types of eating disorders, which broadly include eating disturbances related to dieting (anorexia nervosa, bulimia nervosa and eating disorders not otherwise specified; Roncero et al., 2011; Simpson et al., 2013), bingeing (binge-eating disorder; Conceição Costa et al., 2012) and food avoidance (avoidant-restrictive food intake disorder; Kambanis et al., 2020; Zickgraf et al., 2016). Whilst OCD has been observed across all eating disorders, OCD is most notably observed alongside those with anorexia nervosa, and some studies suggest OC symptoms form a core feature of this eating disorder subtype (Halmi et al., 2003; Levinson et al., 2019).

Existing research has predominantly examined OCD and OC symptomatology among those with an eating disorder, thereby limiting our knowledge of atypical eating behaviours within the OCD population. For example, as noted in the previous chapters, there are no studies to date which explore ARFID and related symptoms in those with OCD. The current, limited literature base which does exist has instead primarily focused on eating disorders associated with dieting (i.e., anorexia nervosa and bulimia nervosa), despite some studies suggesting that ARFID may also be linked to OCD (Bryson et al., 2018; Fisher et al., 2014; Zickgraf et al., 2016). Moreover, the focus on clinical eating disorders in OCD has limited the understanding of the continuum of atypical eating in this group (i.e., non-clinical atypical eating behaviours), which also include food avoidance behaviours, such as selective eating. These non-clinical atypical eating behaviours can worsen if left unmanaged and predict eating disorder development; hence, understanding these eating behaviours may help to prevent co-occurring eating disorders which pose additional complications to an already vulnerable group (Derks et al., 2024; Herle et al., 2020).

Furthermore, the limited existing research base yields mixed findings pertaining to the presence of eating disorders within OCD, which could result from varied statistical methodologies. At the group level, participants with OCD do not appear to differ from healthy controls in their level of eating disorder symptoms (Bang et al., 2020; Boisseau et al., 2012), and tend to fall below the clinical threshold on eating disorder assessment tools (Bang et al., 2020; Boisseau et al., 2012; Fyer et al., 2020; Schneier

et al., 2016; Steinman et al., 2016; van Passel et al., 2020). However, Bang et al. (2020), observed that a greater proportion of OCD participants were more likely to have an eating disorder compared to healthy controls, despite the study observing no differences in eating disorder symptoms between the groups. Therefore, at the group level, individuals with OCD may not differ from controls, but a greater proportion of those with OCD may be at risk of an eating disorder compared to controls. However, research of this nature is limited.

The present study aimed to replicate the studies presented in Chapters 3 and 4 in a clinical cohort of individuals with OCD, alongside age- and gender-matched controls from the general population. The atypical eating behaviours explored included the eating disorders anorexia nervosa and bulimia nervosa and ARFID, as well as the non-clinical atypical eating behaviour of selective eating. Given that prior studies, including that of the current thesis, have proposed that OC symptoms are associated with eating disorder symptoms in participants with OCD and the general population, it was hypothesised that OC symptoms would be associated with atypical eating behaviours in OCD participants and controls. However, due to the limited research which compares atypical eating behaviours between those with OCD and controls, the hypothesis concerning group differences between OCD participants and controls remained exploratory.

Methods

Ethical approval

The study was approved by the University of Hertfordshire Ethics Committee on 8th April 2024 and the research was performed in accordance with the Declaration of Helsinki: Ethics protocol number aLMS/PGR/UH/05462(3). The study protocol involved adults with OCD and gender- and age-matched controls completing a series of online questionnaires to assess OC symptoms, eating disorder symptoms, non-clinical atypical eating behaviours and factors which may underlie atypical eating behaviours.

Participants

Participants with obsessive-compulsive disorder

Fifty participants with OCD (females *n*=41, non-binary *n*=1), aged between 20 and 57 years, were recruited via the charities OCD Action and the Orchard OCD Registry, as well as the social media platforms of X (formerly known as Twitter) and Instagram. The study flyer (Appendix 21), detailing a summary of the research, was presented on each of these platforms asking potential volunteers to email the researcher to express their interest in the study. Upon receiving expressions of interest from potential participants, the researcher explained the eligibility criteria for the study and provided a link which directed those interested to the participant information sheet, consent form and the study questionnaires. Participants had to be aged between 18 and 65 years, be able to read and comprehend English and have OCD. Having OCD was defined by at least one of the following: (i) having formally diagnosed OCD, (ii) has been told by a healthcare professional that they have OCD or (iii) was currently receiving or has received treatment for OCD (e.g., psychological therapies or medication). The decision to also include participants without a formal OCD diagnosis was to ensure that the study was representative of the wider OCD population where not all individuals with OCD are formally diagnosed, but have received

treatment or have been told that they have OCD by a healthcare professional. Participants were recruited over a period of three months and received a £10 voucher for their participation.

Control participants

Upon completion of the data collection for OCD participants, a total of 50 controls from the general population were recruited via the online research recruitment platform, Prolific. Stratified sampling was adopted to ensure that the control sample was age- and gender-matched to the OCD sample. Volunteers for the control sample had to be aged between 18 and 50 years, which was calculated using the mean age of the OCD participants ± 2 standard deviations. In line with the OCD sample, 41 females and 9 males were recruited for the study. Potential control participants (n=150) had to complete a brief screening tool, consisting of the OCI-R and four questions about their history relating to OCD to assess their eligibility for the study. Those with OCD or clinically relevant OC symptoms were excluded which was defined as scoring greater than the clinical cut-off score on the OCI-R (>21) or answering 'yes' to one of the following questions: (i) have you ever been formally diagnosed with OCD?; (ii) have you ever been told by a healthcare professional (e.g., therapist, GP, psychiatrist) that you have OCD?; (iii) have you ever received treatment for OCD?; (iv) do you self-identify as having OCD? Eligible participants (n = 111) were then invited to participate in the full study. Full study recruitment slots were filled on a first come first served basis. Participants completing the screening and/or the full study were reimbursed at the value of £9 per hour. Recruitment, including screening participants for eligibility, was carried out over a one-week period.

Procedure

All aspects of the study, including the participant information sheet, consent form and study measures, were accessed and completed online using the survey platform, Qualtrics. Firstly, participants were presented with the participant information sheet which had to be read prior to completing the consent form (Appendices 22-25). Participants who provided their informed consent to take part were then permitted access to the study questionnaires. Both OCD participants and controls completed the same study measures, all of which were presented in the same order. Completion of the study took approximately 30 minutes. Participants were not asked to provide any identifiable information when completing the study measures and all participants were identified using an anonymity code; OCD participants were asked to create a six-digit anonymity code, whereas control participants were automatically assigned an anonymity code via Prolific.

Upon completion of the study measures, participants were thanked for their time and provided with a debrief sheet (Appendix 28) detailing further information about the study and details on how to seek help if the questionnaires raised any concerns. OCD participants were asked to confirm completion of their participation by sending an email to the researcher, after which they were provided with a £10 gift voucher. Control participants were asked to enter a completion code on Prolific to receive their reimbursement.

Measures

Demographics

All participants were asked to complete a series of questions relating to their age, gender, occupational status, ethnic and ancestral background and their highest level of education. At this stage, participants were also asked to report whether they had ever been diagnosed with a mental health condition; participants responding 'yes' were asked to provide further details on the condition diagnosed.

Participants with OCD were asked to provide additional information about their OCD and symptoms. This included details of their diagnosis, age of OCD symptom onset, current and previous treatment for OCD and family history of OCD (Appendix 36).

Body-mass index

Participants reported their height and weight to calculate their BMI; height and weight measurements were converted to metres (m) and kilograms (kg), respectively, and BMI was calculated using the following formula: $BMI = kg/m^2$.

Obsessive-compulsive symptoms

Obsessive-compulsive symptoms were assessed using the 18-item OCI-R (Foa et al., 2002). Those scoring 21 or more are likely to have OCD. Full details of this measure are provided in Chapters 3 and 4. In the current study, the OCI-R subscales demonstrated internal reliability coefficients ranging between acceptable and excellent (hoarding, $\alpha = .786$; checking, $\alpha = .88$; neutralising, $\alpha = .884$; ordering, $\alpha = .895$; washing, $\alpha = .929$; obsessing, $\alpha = .944$). OCI-R total and subscales were used in the analysis.

Eating disorder symptoms

Avoidant-restrictive food intake disorder

Symptoms associated with ARFID were assessed using the NIAS, which is a nine-item self-report scale (Zickgraf & Ellis, 2018). Total scores range between 0 and 45 and subscale scores range between 0 and 15, with higher scores suggesting more severe ARFID symptoms. Those scoring 10 or higher on the NIAS-SE and NIAS-F subscales capture those meeting criteria for ARFID associated with selective eating and fearing consequences of eating, respectively. A score of 9 or higher on the NIAS-A indicates the person meets the criteria for ARFID associated with a lack of appetite or interest in food. Full details of this measure are provided in Chapter 4. The NIAS subscales exhibited good internal reliability in the current study (NIAS-SE, $\alpha = .863$; NIAS-A, $\alpha = .897$; NIAS-F, $\alpha = .895$). Total NIAS scores were used for the analyses, however subscale scores were used for the Chi-Squared tests.

Anorexia nervosa and bulimia nervosa symptoms

Eating disorder symptoms associated with anorexia nervosa and bulimia nervosa were assessed using the EAT-26 (Garner et al., 1982). Total scores range between 0 and 78, and greater scores suggest more severe eating disorder symptoms; scores exceeding 20 indicate that the respondent may have an eating disorder. Full details of this measure are provided in Chapter 4. In the present study, the EAT-BF (α = .766) had acceptable internal reliability, and the EAT-D (α = .864) and EAT-OC (α = .803) had good internal reliability. Total EAT-26 scores were used in the current study.

Non-clinical atypical eating behaviours

Selective eating

Selective eating was assessed using two separate scales – the Food Fussiness subscale of the AEBQ (AEBQ-FF; Hunot et al., 2016) and the APEQ (Ellis et al., 2017). The AEBQ assesses selective eating behaviours, including food neophobic behaviours, using five items. Items are responded to on a five-point Likert scale ranging between *'1 – Never'* to *'5 – Always'* and greater scores suggest more severe selective eating and/or food neophobic tendencies. Full details of the whole AEBQ measure are presented in Chapter 3. The AEBQ-FF had excellent internal reliability in the current study as determined by reliability coefficients of α = .955.

The APEQ assesses selective eating, drawing attention to meal presentation (APEQ-MP), food variety (APEQ-FV), meal disengagement (APEQ-MD) and taste aversion (APEQ-TA). Higher overall and subscale scores suggest more severe selective eating behaviours. Full details of the APEQ are provided in Chapter 3. Internal reliability for the APEQ in the current study ranged between acceptable to good (APEQ-FV, α =.774; APEQ-MD, α = .794; APEQ-TA, α = .819; APEQ-MP, α = .879). The total APEQ score was used in the study.

Statistical analysis

A mixed methods statistical analysis was adopted for Part I. First, differences in atypical eating behaviours between OCD participants and controls were explored using a series of independent samples t-tests. Both eating disorder symptoms (EAT-26 and NIAS) and non-clinical selective eating (AEBQ-FF and APEQ) were compared. Thereafter, a Chi-Square analysis was used to determine whether there was a difference in the number of OCD participants and controls that met the clinical threshold for an eating disorder on the EAT-26 and NIAS.

Lastly, within groups, Pearson's correlations examined whether there was a relationship between OC symptoms and atypical eating behaviours. Following this, a series of hierarchical regressions were conducted to explore whether demographic variables (age and gender) and OC symptoms (OCI-R total and subscale scores) could predict atypical eating behaviours in the OCD group and controls. The hierarchical regressions were carried out in three steps: Model 1 consisted of age and gender, Model 2 included OCI-R total scores alongside age and gender, and Model 3 examined whether age, gender or the OCI-R subscales could predict atypical eating behaviours.

As with Chapters 3 and 4, the same dummy variables were used during the hierarchical regression analyses. For gender, females were coded as '1' and males were coded as '0'. Positive beta coefficients would indicate that being female increases the predictive effect on the atypical eating behaviour, compared to being male.

Results

Sample statistics

A total of 50 participants with OCD, aged between 20 and 57 years, completed the study. Of the 50 participants, 41 were female, 8 were male and one person identified as non-binary. BMI data was missing for six OCD participants; however, the rest of the data was complete. Seventy-four percent of OCD participants had a formal diagnosis (n=37), 14% did not have a formal diagnosis (n=7) and 12% were unsure (n=6). The mean age of OCD symptom onset was 12.8 years (SD=6.96). All participants, except one, reported having received treatment for OCD during their lifetime and 70% reported that they were currently receiving treatment for OCD. Current treatments included medication (n=18), psychological therapies (n=9) and combined medication and psychological therapies (n=10). A family history of OCD was reported by 70% of the OCD participants (n=35).

Fifty age- and gender-matched controls participated in the study, however five participants (females n=4, males n=1) were removed from the dataset due to scoring above the clinical threshold on the OCI-R in the full study. Therefore, the final control sample consisted of 45 adults (females n=38, males n=7) aged between 20 and 49 years. Demographic details for all participants are presented in Table 6.1.1.

Table 6.1.1.
Demographic details of OCD participants and controls

	OCD n=50		**Controls n=45**	
	n	*%*	*n*	*%*
Gender				
Female	41	82%	38	84.4%
Male	8	16%	7	15.6%
Non-binary	1	2%	-	-
Ethnicity/Ancestral background				
English/Welsh/Scottish/Northern Irish	38	76%	29	64.4%
Irish	1	2%	-	-
Any other white backgrounds	2	4%	8	17.8%
Indian	2	4%	-	-
Pakistani	-	-	1	2.2%
Chinese	-	-	1	2.2%
White and Black Caribbean	3	6%	-	-
White and Black African	1	2%	-	-
White and Asian	-	-	2	4.4%
Other mixed/multiple ethnic backgrounds	2	4%	2	4.4%
Other	1	2%	2	4.4%
Employment status				
Full-time work	24	48%	28	62.2%

Part-time work	9	18%	10	22.2%
Full-time student	7	14%	5	11.1%
Part-time student	1	2%	-	-
Unemployed	7	14%	1	2.2%
Prefer not to say	2	4%	1	2.2%
Highest education level				
Postgraduate degree	9	18%	9	20%
Undergraduate degree	30	60%	22	48%
PGCE	1	2%	-	-
A-Levels	6	12%	8	17.8%
GCSEs/O-Levels	-	-	2	4.4%
Trade, technical or vocational training	-	-	3	6.7%
Other	4	8%	-	-
Prefer not to say	-	-	1	2.22%
Mental health/neurodevelopmental disorder diagnosis (excluding OCD in OCD participants)				
No	13	26%	31	68.9%
Yes	37	74%	14	31.1%
Anxiety and depression related disorders	30	60%	14	31.1%
Eating disorders	5	10%	-	-
Autism Spectrum Disorder	3	6%	-	-
Attention-deficit hyperactivity disorder	4	8%	-	-
Dermotillomania	1	2%	-	-

Independent samples t-tests observed no differences in age between the OCD sample and controls. OCD participants scored significantly higher than controls on the OCI-R, and reported significantly lower BMI than the controls. A summary of the independent samples t-tests is presented in Table 6.1.2.

Table 6.1.2.
Mean ages, BMI and OC symptoms of OCD participants and controls

	OCD n=50		**Controls n=45**				
	M	***SD***	***M***	***SD***	***df***	***t***	***p***
Age	31.62	9.10	32.64	7.49	93	-.595	.553
BMI	24.22	5.80	28.81	10.38	86	-2.548	**.013***
OCI-R^{V}	31.84	14.63	9.1778	4.68	59.90	10.379	**<.001*****

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$; BMI = Body-mass index; OCI-R = Obsessive-compulsive inventory - Revised
^{V} = Levene's test significant. Equal variances not assumed values reported

Comparison of atypical eating behaviours between OCD participants and controls

A series of independent samples t-tests explored whether atypical eating behaviours differed between OCD participants and controls. Assumption testing observed that the atypical eating behaviours were not normally distributed, but this was expected given the nature of the measures. All atypical eating behaviours, except the AEBQ-FF, showed unequal variances between groups. Therefore, unassumed equal variances were reported for the NIAS, EAT-26 and APEQ. Box-plots identified outlier scores; to

assess their impact, independent samples t-tests were conducted with the outliers excluded, however the significances between groups remained. Therefore, the outliers were not removed from the dataset.

OCD participants reported significantly greater EAT-26 total scores and NIAS total scores, suggesting that those with OCD experienced more severe eating disorder symptoms compared to controls. Moreover, OCD participants also reported greater non-clinical selective eating behaviours as assessed by the APEQ, but not the AEBQ-FF, compared to the control group. Group means are presented in Table 6.1.3.

Table 6.1.3.
Independent samples t-tests to compare atypical eating behaviours between OCD participants and controls

	OCD n=50		**Controls n=45**				
	M	***SD***	***M***	***SD***	***df***	***t***	***p***
NIAS total^{V}	15.70	11.38	7.20	7.24	84.082	4.386	**<.001*****
EAT-26 total^{V}	11.58	11.52	6.47	7.26	83.650	2.613	**.011***
AEBQ-FF	2.23	.83	2.10	.97	93	1.249	.215
APEQ total^{V}	2.19	.84	1.62	.51	82.129	4.043	**<.001*****

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating
^{V} = Levene's test significant. Equal variances not assumed values reported

Chi-square analyses also revealed significant differences in the number of OCD participants and controls meeting the threshold for an eating disorder. A greater number of OCD participants were more likely to meet the threshold for ARFID associated with a lack of appetite (NIAS-A) and fear of eating (NIAS-F), as well as anorexia nervosa and bulimia nervosa (EAT-26). These findings are presented in Table 6.1.4.

Table 6.1.4.
Number of participants meeting the clinical threshold for eating disorders

	OCD *n*=50	**Controls *n*=45**	χ^2	***p***
NIAS-SE	9/50 (18.0%)	5/45 (11.1%)	.895	.344
NIAS-A	15/30 (30.0%)	1/45 (2.2%)	13.048	<.001***
NIAS-F	10/50 (20.0%)	1/45 (2.2%)	7.311	.017*
EAT-26	13/50 (26.0%)	3/45 (6.7%)	6.321	.012*

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
NIAS total = NIAS selective eating subscale; NIAS-A = NIAS lack of appetite subscale; NIAS-F = NIAS fear of eating subscale; EAT-26 total = Eating Attitudes Test-26 total score

Examining the relationship between OC symptoms and atypical eating behaviours among OCD participants and controls

Correlations between OC symptoms and atypical eating behaviours

A series of Pearson's correlations explored whether overall OC symptoms were associated with eating disorder symptoms and selective eating in the OCD group and controls. Within the control group, the OCI-R shared weak positive correlations with the NIAS total and the APEQ. Table 6.1.5 presents the correlation coefficients for control participants.

Table 6.1.5.
Correlations between OC symptoms and eating behaviours in controls

		1.	*2.*	*3.*	*4.*	*5.*
1.	***OCI-R***	1				
2.	***NIAS total***	.297*	1			
3.	***EAT-26 total***	.275	.097	1		
4.	***AEBQ-FF***	.247	.801**	.123	1	
5.	***APEQ***	.366**	.685**	.161	.530**	1

*Note: *p ≤ .05; **p ≤ .01*
OCI-R = Obsessive-compulsive inventory – Revised; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating

Among OCD participants, the OCI-R was significantly and positively correlated with the NIAS total, EAT-26 total, AEBQ-FF and the APEQ. The strength of the associations ranged between weak and strong, with the strongest association being between the OCI-R and APEQ. Correlation coefficients for the OCD group are presented in Table 6.1.6.

Table 6.1.6.
Correlations between OC symptoms and eating behaviours in OCD participants

		1.	*2.*	*3.*	*4.*	*5.*
1.	***OCI-R***	1				
2.	***NIAS total***	.410**	1			
3.	***EAT-26 total***	.302*	.595**	1		
4.	***AEBQ-FF***	.289*	.621**	.492**	1	
5.	***APEQ***	.605**	.698**	.572**	.473**	1

*Note: *p ≤ .05; **p ≤ .01*
OCI-R = Obsessive-compulsive inventory - Revised; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating

Examining the predictive effect of OC symptoms on atypical eating behaviours

A series of hierarchical regressions examined the predictive effect of demographic variables and OC symptoms on each of the atypical eating behaviours within both the participant groups. Each hierarchical regression consisted of three steps: Model 1 included age and gender; Model 2 included age, gender, and total OCI-R scores; and Model 3 included age, gender, and the individual OCI-R subscales.

Assumption testing was carried out prior to the analysis. As expected, due to the nature of the assessments, the atypical eating behaviours of both the OCD group and control group were not normally distributed. For Model 1, gender did not correlate with any of the atypical eating behaviours, and age was only correlated with the NIAS in the OCD group. For Model 2, OCI-R total scores were correlated with all atypical eating behaviours, except the AEBQ-FF in the control group. For both Models 1 and 2, there was no multicollinearity between the predictor variables (see tables 6.1.7 and 6.1.8) and standard residuals were normally distributed, except for the EAT-26. Cook's distance values remained below one, suggesting no individual cases affected the regressions for Model 1 or 2.

For Model 3, there was some collinearity between the OCI-R subscales, however tolerance values were over .45 and VIF values remained below 3, suggesting multicollinearity was not a concern (see tables 6.1.7 and 6.1.8). Not all of the OCI-R subscales correlated with atypical eating behaviours in each group; most significant relationships were observed in the OCD group. Inspection of P-Plots indicated that the residuals did not substantially deviate from normality. Although, some of standardised residuals exceeded 3, Cook's distance values were all below 1, suggesting no individual cases influenced Model 3.

Table 6.1.7.
Tolerance and VIF values for predictors across the hierarchical regression models – controls

Model	Predictor	Tolerance	VIF
1	Age	.893	1.120
	Gender	.893	1.120
2	Age	.877	1.141
	Gender	.877	1.141
	OCI-R total	.973	1.028
3	Age	.827	1.209
	Gender	.818	1.223
	Washing	.843	1.186
	Obsessing	.829	1.206
	Hoarding	.779	1.284
	Ordering	.881	1.135
	Checking	.882	1.134
	Neutralising	.793	1.261

Note: OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

Table 6.1.8.
Tolerance and VIF values for predictors across the hierarchical regression models – OCD

Model	Predictor	Tolerance	VIF
1	Age	.963	1.038
	Gender	.963	1.038
2	Age	.871	1.148
	Gender	.940	1.064
	OCI-R total	.897	1.115
3	Age	.817	1.223
	Gender	.839	1.192
	Washing	.658	1.519
	Obsessing	.809	1.236
	Hoarding	.575	1.739
	Ordering	.470	2.129
	Checking	.513	1.951
	Neutralising	.460	2.172

Note: OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

Controls

The regression models could not predict eating disorder symptoms among control participants. NIAS total: Model 1, R^2 = .006, adjusted R^2 = -.042, $F(2, 42) = .121$, $p = .886$; Model 2, R^2 = .100, adjusted R^2 = .034, $F(3, 41) = 1.511$, $p = .226$; Model 3, R^2 = .190, adjusted R^2 = .010, $F(8, 36) = 1.058$, $p = .413$. EAT-26 total: Model 1, R^2 = .045, adjusted R^2 = .000, $F(2, 42) = .997$, $p = .377$; Model 2, R^2 = .106, adjusted R^2 = .040, $F(3, 41) = 1.619$, $p = .200$; Model 3, R^2 = .265, adjusted R^2 = .102, $F(8, 36) = 1.626$, $p = .152$.

Moreover, the regression models could not predict non-clinical selective eating behaviours. AEBQ-FF: Model 1, R^2 = .005, adjusted R^2 = -.042, $F(2, 42) = .108$, $p = .898$; Model 2, R^2 = .069, adjusted R^2 = .001, $F(3, 41) = 1.015$, $p = .396$; Model 3, R^2 = .124, adjusted R^2 = -.070, $F(8, 36) = .639$, $p = .740$. APEQ: Model 1, R^2 = .010, adjusted R^2 = -.037, $F(2, 42) = .222$, $p = .802$; Model 2, R^2 = .115, adjusted R^2 = .050, $F(3, 41) = 1.772$, $p = .168$; Model 3, R^2 = .263, adjusted R^2 = .099, $F(8, 36) = 1.605$, $p = .158$.

OCD participants

Neither Model 1 (R^2 = .063, adjusted R^2 = .022, $F(2, 46) = 1.538$, $p = .226$) nor Model 3 (R^2 = .238, adjusted R^2 = .085, $F(8, 40) = 1.559$, $p = .168$) could predict NIAS total scores. However, Model 2 was a significant predictor, accounting for 18.9% of the variance in NIAS total scores (R^2 = .189, adjusted R^2 = .135, $F(3, 45) = 3.493$, $p = .023$). Of Model 2, OCI-R total scores were a unique predictor of the NIAS total, with one standard deviation increase in OCI-R scores resulting in a .38 standard deviation increase in NIAS total scores ($\beta = .38$, $p = .011$). This suggests that OCD participants with elevated OC symptoms are more likely to display ARFID symptoms. Statistical values can be found in Table 6.1.9.

Table 6.1.9.
Summary of the hierarchical regression analysis for study variables predicting overall NIAS scores in OCD participants

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	**25.74*** **	**.00**	**4.315**	**<.001**	12.04	.00	1.577	.122	16.86	.00	1.852	.071
Age	-.32	-.25	-.1739	.089	-.17	-.13	-.938	.353	-.20	-.16	-1.019	.314
Gender	.47	.02	.109	.914	-1.20	-.04	-.295	.769	.14	.00	.031	.975
OCI-R total					**.29***	**.38**	**2.646**	**.011**				
Washing									.39	.15	.882	.383
Obsessing									-.26	-.07	-.429	.670
Hoarding									1.15	.31	1.722	.093
Ordering									.17	.05	.234	.816
Checking									-.19	-.06	-.318	.752
Neutralising									.26	.09	.452	.654
R^2 / R^2 adjusted	.063 / .022				.189 / .135				.238 / .085			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

None of the three models could predict EAT-26 total scores: Model 1, R^2 = .051, adjusted R^2 = .010, $F(2, 46) = 1.243$, p = .298; Model 2, R^2 = .121, adjusted R^2 = .063, $F(3, 45) = 2.073$, p = .117; Model 3, R^2 = .301, adjusted R^2 = .161, $F(8, 40) = 2.151$, p = .053 (Table 6.1.10).

Table 6.1.10.
Summary of the hierarchical regression analysis for study variables predicting overall EAT-26 scores in OCD participants

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	**19.53** **	**.00**	**3.302**	**.002**	9.46	.00	1.208	.233	13.31	.00	1.549	.129
Age	-.25	-.20	-1.370	.177	-.14	-.11	-.752	.456	-.28	-.22	-1.539	.132
Gender	-2.13	-.07	-.502	.618	-3.35	-.12	-.804	.426	-.84	-.03	-.201	.841
OCI-R total					.21	.28	1.896	.064				
Washing									**1.27** **	**.50**	**3.060**	**.004**
Obsessing									.38	.10	.666	.509
Hoarding									.35	.10	.558	.580
Ordering									-.75	-.22	-1.120	.269
Checking									**-1.17***	**-.38**	**-2.071**	**.045**
Neutralising									.90	.32	1.634	.110
R^2 / R^2 adjusted	.051 / .010				.121 / .063				.301 / .161			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

None of the three models could predict AEBQ-FF: Model 1, R^2 = .018, adjusted R^2 = -.024, $F(2, 46)$ = .431, p = .653; Model 2, R^2 = .087, adjusted R^2 = .026, $F(3, 45)$ = 1.420, p = .249; Model 3, R^2 = .130, adjusted R^2 = -.044, $F(8, 40)$ = .748, p = .053 (Table 6.1.11).

Table 6.1.11.
Summary of the hierarchical regression analysis for study variables predicting AEBQ-FF scores in OCD participants

	Model 1				**Model 2**				**Model 3**			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	**2.68*** **	**.00**	**6.037**	**<.001**	**1.95****	**.00**	**3.306**	**.002**	**2.25****	**.00**	**3.188**	**.003**
Age	-.01	-.13	-.862	.393	.00	-.04	-.273	.786	.00	-.04	-.250	.804
Gender	.16	.07	.503	.618	.07	.03	.226	.823	.17	.08	.487	.629
OCI-R total					.02	.28	1.832	.074				
Washing									.01	.04	.214	.831
Obsessing									-.03	-.10	-.599	.553
Hoarding									.05	.18	.930	.358
Ordering									.04	.17	.800	.429
Checking									-.01	-.05	-.237	.814
Neutralising									.02	.07	.336	.739
R^2 / R^2 adjusted	.018 / -.024				.087 / .026				.130 / -.044			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

Model 1 could not significantly predict APEQ scores (R^2 = .084, adjusted R^2 = .045, $F(2, 46)$ = 2.118, p = .132), however Model 2 was a significant predictor, explaining 36% of the variance (R^2 = .360, adjusted R^2 = .317, $F(3, 45)$ = 8.442, p < .001). The OCI-R total score was a unique predictor, with one standard deviation increase in OCI-R total associated with a .55 standard deviation increase in APEQ scores (β = .55, p = <.001).

Moreover, Model 3 was also a significant predictor, accounting for 46% of variance in the APEQ scores (R^2 = .462, adjusted R^2 = .354, $F(8, 40)$ = 4.287, p < .001). The OCI-R hoarding subscale was a unique predictor; a one standard deviation increase led to a .43 standard deviation increase in APEQ scores (β = .43, p = .007).

These hierarchical regressions suggest that individuals with OCD, who have elevated overall symptoms as well as hoarding symptoms, are more likely to engage in selective eating behaviours as measured by the APEQ. A summary of these hierarchical regressions is presented in Table 6.1.12.

Table 6.1.12.
Summary of the hierarchical regression analysis for study variables predicting APEQ scores in OCD participants

	Model 1				Model 2				Model 3			
Predictors	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***	**B**	**β**	***t***	***p***
Intercept	**2.82*** **	**.00**	**6.522**	**<.001**	**1.34** **	**.00**	**2.684**	**.010**	**1.84** **	**.00**	**3.227**	**.002**
Age	-.02	-.25	-1.706	.095	-.01	-.07	-.555	.582	-.01	-.12	-.968	.339
Gender	.45	.21	1.458	.152	.27	.13	1.022	.312	.042	.19	1.528	.134
OCI-R total					**.03*** **	**.55**	**4.404**	**<.001**				
Washing									.05	.27	1.874	.068
Obsessing									-.01	-.04	-.307	.760
Hoarding									**.12** **	**.43**	**2.820**	**.007**
Ordering									.00	-.01	-.053	.958
Checking									-.04	-.16	-.971	.331
Neutralising									.05	.23	1.338	.188
R^2 / R^2 adjusted	.084 / .045				.360 / .317				.462 / 354			

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
OCI-R total = Obsessive-compulsive Inventory – Revised total score; Washing = OCI-R washing subscale; Obsessing = OCI-R obsessing subscale; Hoarding = OCI-R hoarding subscale; Ordering = OCI-R ordering subscale; Checking = OCI-R checking subscale; Neutralising = OCI-R neutralising subscale

Analysis summary

In summary, those with OCD were more likely to experience elevated levels of atypical eating behaviours and reach the threshold for an eating disorder compared to controls. OC symptoms in the OCD group were associated with all atypical eating behaviours. In the control group, OC symptoms were only associated with ARFID and selective eating, as assessed by the APEQ.

The hierarchical regression models for the general population failed to find a relationship between OC symptoms and atypical eating behaviours. Analyses concerning the OCD participant sample suggested that OC symptoms, over and above demographic variables, could predict ARFID symptoms and non-clinical selective eating behaviours. Selective eating could also be predicted by OC symptoms related to hoarding.

Discussion

The present study examined how atypical eating behaviours relate to OC symptoms in adults with OCD and controls, and whether the presentation of atypical eating behaviours differed between these groups. Between group analyses observed that those with OCD expressed more severe eating disorder symptoms and were more likely to reach the threshold for an eating disorder compared to age- and gender-matched controls. Moreover, OCD participants reported more non-clinical selective eating behaviours compared to controls. These findings clearly indicate atypical eating behaviours may be a consistent feature of many adults with OCD.

The findings highlighted that atypical eating behaviours were elevated in the OCD group, a pattern somewhat inconsistent with the limited existing literature base. Both Boisseau and colleagues (2012) and Bang and colleagues (2020) did not find differences between OCD participants and controls on eating disorder symptoms. However, Bang and colleagues (2020) also observed that participants with OCD were more likely to have a probable eating disorder compared to controls, which aligns with the findings of the present study. Similarly, Fyer and colleagues (2020) and Garcia and colleagues (2020) reported that participants with OCD were more likely to display eating disorder symptoms or behaviours compared to controls, consistent with the current findings. Overall, in line with existing, albeit limited, research, these results suggest that those with OCD may present with a heightened vulnerability to atypical eating behaviours.

This was also the first study to examine selective eating behaviours in *adults* with OCD; OC symptoms in adults with OCD were strongly related to, and could predict, elevated levels of selective eating, which concurs with the general population study of Chapter 3. These findings are also in line with a previous study, which reported greater selective eating behaviours in *children* with obsessive-compulsive spectrum disorders, anxiety disorders and neurodevelopmental disorders (Zickgraf & Elkins, 2018). Moreover, the current study observed that OC symptoms of hoarding were specifically associated with selective eating, which had not been identified in previous research. This novel association suggests that food avoidance, particularly selective eating, may correspond to broader patterns of OC symptomatology that extend beyond contamination concerns, as identified earlier in Chapter 4.

Whilst further research is needed to reaffirm the current study's findings, the results suggest that selective eating often presents in adults with OCD, which provides important implications for understanding atypical eating behaviours in this population. Given that non-clinical atypical eating behaviours can worsen and have a significant impact on wellbeing and quality of life, earlier identification of these eating behaviours is needed (Ellis et al., 2018; Herle et al., 2020).

Moreover, the study findings provided support for the hypothesis which proposed that OC symptoms would be associated with atypical eating behaviours in participants with OCD. As expected, OC symptoms were associated with ARFID, anorexia nervosa and bulimia nervosa symptoms, as well as selective eating, in the OCD group. OC symptoms also predicted ARFID and non-clinical selective eating, but not eating disorder symptoms relating to anorexia nervosa and bulimia nervosa, suggesting that OC symptoms in adults with OCD only had a causational effect on food avoidance. Consistent with the earlier chapters, this pattern reinforces the suggestion OC symptoms are not only associated with pathological eating patterns related to weight and shape concerns, but also those characterised by extreme avoidance.

These findings are of interest as most existing research has highlighted an association between OC symptoms and dieting related eating disorders, particularly anorexia nervosa (Cederlöf et al., 2015; Garcia et al., 2020; Levinson et al., 2019). It could be that, while adults with OCD are more prone to anorexia nervosa or bulimia nervosa, other factors, rather than OC symptoms may contribute towards the presentation of anorexia nervosa and bulimia nervosa in these individuals. For example, as described in Chapter 5, overlapping features of OCD and eating disorders, such as perfectionism or emotion dysregulation, may increase the likelihood of eating disorders within this group. As such, the findings suggest that the presentation of anorexia nervosa or bulimia nervosa among those with OCD may be driven by a complex network of transdiagnostic factors.

It is also important to note that all but one OCD participant reported having treatment for OCD, and 70% were currently undergoing treatment. It is possible that being on treatment minimised the likelihood of developing additional complications, including atypical eating behaviours. Additionally, treatments for OCD, including psychological therapies and pharmacological interventions, are also adopted in the treatment of eating disorders, particularly anorexia nervosa and bulimia nervosa (Linardon et al., 2017; Muratore & Attia, 2022; Simpson et al., 2013). Therefore, being a recipient of OCD treatment may have aided in the prevention and/or treatment of potential anorexia nervosa and bulimia nervosa related symptoms.

There was only partial support for the hypothesis that OC symptoms and atypical eating behaviours would be associated in the control group. Within this group, OC symptoms correlated with ARFID symptoms and selective eating, but were not associated with anorexia nervosa or bulimia nervosa symptoms, and did not predict any atypical eating behaviours. These results suggest that OC symptoms in individuals without OCD may not be linked to atypical eating behaviours, contrary to the study hypothesis. However, this finding may reflect the study's inclusion criteria. In the present study, adults who exceeded the clinical threshold on the OCI-R were excluded to minimise the confounding effect of clinically relevant OC symptoms when comparing atypical eating between the OCD and control groups. Previous studies, including those described in Chapters 3 and 4, that observed associations between OC symptoms and atypical eating behaviours in the general population did not exclude participants with clinically significant symptoms, which may explain the significant associations reported in those studies (e.g., (Barnhart et al., 2021; Zickgraf, Ellis, et al., 2019). Therefore, the findings of the current study cannot be directly compared to existing research.

Selective eating behaviours assessed by the AEBQ-FF were not associated with OC symptoms in either group, however selective eating assessed by the APEQ was associated with OC symptoms in both OCD participants and controls. This highlights that the AEBQ-FF may not capture the entirety of selective eating that is associated with OC symptoms, whereas the APEQ examines additional aspects of selective eating, such as meal presentation and meal disengagement, which have been linked to OCD (Barnhart et al., 2023).

A strength of the study was that the OCD sample was compared against an age- and gender-matched control group without clinically relevant OCD symptoms, to ensure that OC symptoms in the control group did not contaminate the findings. However, whilst it was important to control for clinically relevant OC symptoms in the control group, this may not be entirely reflective of the wider general population where OC symptoms are prevalent in up to 20% of individuals (Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Fullana et al., 2009, 2010; Grabe et al., 2000). Moreover, the study did not consider a control group without OCD; it would also be of merit to compare eating behaviours in OCD to a clinical control group, such as those with anxiety disorders, as earlier research stipulates that eating disorder prevalence is similar across these diagnostic groups (Tyagi et al., 2015).

There are also other limitations to note. Five control participants were removed due to scoring above the clinical threshold on the OCI-R, reducing the sample size of the control group. The samples were also predominantly females which hinders the ability to generalise the findings, particularly as research has highlighted that males with OCD are more at risk of eating disorders compared to their female counterparts (Cederlöf et al., 2015; Meier et al., 2015). As with other studies of the thesis, the measures utilised were subjective and based on self-report; objective measures or clinician administered tools of atypical eating and/or OC symptoms would help to ensure validity of the findings.

Overall, the study highlighted that adults with OCD exhibited significantly more eating disorder symptoms and non-clinical selective eating behaviours than age- and gender-matched controls, and were more likely to have a probable eating disorder. The observation of clinical and non-clinical food avoidance (i.e., selective eating and ARFID) in OCD participants reinforces the idea that those with OCD may not solely engage in atypical eating behaviours due to concerns over bodyweight and shape. Moreover, these findings advance the understanding of OCD by suggesting that its symptoms may extend beyond traditional diagnostic frameworks to encompass food avoidance. Going forward, it would be important to screen for food avoidance in patients with OCD.

Part II: Examining why adults with OCD display atypical eating behaviours

Introduction

Part I of the study highlighted that adults with OCD experience more eating disorder symptoms, as well as non-clinical selective eating behaviours, compared to controls. However, not all adults with OCD will present with atypical eating behaviours. Therefore, it would be important to understand what factors may differentiate between individuals who develop these eating behaviours and those who do not.

OCD or OC symptoms are considered potential risk factors for the development of eating disorders such as anorexia nervosa and bulimia nervosa (Buckner et al., 2010; Garcia et al., 2020; Hofer et al., 2018; Micali et al., 2011). However, it remains unclear whether OC symptoms directly contribute to this risk, or if the relationship is underpinned by overlapping characteristics or shared aetiologies of OCD and eating disorders. As described in Chapter 5, shared characteristics of OCD and eating disorders include perfectionism, emotion dysregulation, anxiety, OCPD traits, sensory sensitivity and cognitive rigidity.

Another trait related to OCD and eating disorders is impulsivity, which refers to rapid, unplanned reactions to internal or external stimuli without consideration of negative consequences arising from these reactions (Moeller et al., 2001). In terms of neurocognition, impulsivity can also be described as the lack of inhibitory control, which can lead to a lack of control over thoughts and behaviours (Chambers et al., 2009). Impulsivity is proposed to occur on a spectrum, at the opposite end of compulsivity (Hollander & Rosen, 2000). However, contemporary conceptualisations of impulsivity and compulsivity have highlighted commonalities, such as the inability to inhibit thoughts and behaviours, which indicates that these traits are not mutually exclusive (Clarke et al., 2024; Fineberg et al., 2014).

Many studies have also reported elevated levels of impulsivity in OCD, which was historically characterised as a disorder high in compulsivity (Boisseau et al., 2012; Clarke et al., 2024; Fineberg et al., 2014; Grassi et al., 2015; Prochazkova et al., 2018; Sahmelikoglu Onur et al., 2016). Impulsivity is also observed in eating disorders; however, it is mostly linked to binge-purging presentations, including bulimia nervosa and the binge-purge subtype of anorexia nervosa (Claes et al., 2002).

Studies have suggested that impulsivity may account for eating disorder symptoms in OCD, and vice versa. For example, Peters and colleagues (2019) observed that bingeing and purging behaviours in adults with OCD could be predicted by mood instability and impulsivity. Similar patterns were also observed in those with anorexia nervosa and bulimia nervosa, whereby greater levels of impulsivity

were associated with more severe OC symptoms and purging behaviours, suggesting that impulsivity may drive OC symptoms within these groups (Bevione et al., 2024; Claes et al., 2002, 2021; Hoffman et al., 2012). Given that impulsivity is associated with OC symptoms and eating disorder symptoms, there would be merit in further exploring whether impulsivity may underlie the presence of atypical eating behaviours in OCD.

Part I of the study also highlighted that non-clinical selective eating was particularly prevalent among OCD participants, and that OC symptoms could predict these eating behaviours. As described in Chapter 5, cognitive rigidity and sensory sensitivity have been implicated with selective eating in children with OCD, OC-spectrum disorders (e.g., trichotillomania), anxiety disorders (e.g., specific phobias or generalised anxiety disorder) and autism spectrum disorder, as well as undergraduate students (Zickgraf et al., 2022; Zickgraf & Elkins, 2018). However, as these studies adopted participant groups with varied diagnoses and ages, it is not possible to infer these findings to adults with OCD. Given that selective eating is associated with psychopathologies, poor nutritional intake and weight-related problems, it would be of interest to examine whether cognitive rigidity and sensory sensitivity influence selective eating behaviours in adults with OCD (Ellis et al., 2018; Wildes et al., 2012).

The current study aimed to address whether risk factors, aside from OC symptoms, underpinned the presentation of atypical eating behaviours in adults with OCD. In line with Chapter 5, the alternative variables of interest included perfectionism, emotion regulation, OCPD symptoms, anxiety, sensory sensitivity and cognitive rigidity; the trait of impulsivity was also introduced in the current study. As previous studies have reported that alternative variables may underlie the relationship between OC symptoms and atypical eating behaviours, it was hypothesised that OC symptoms alone would not contribute to atypical eating. However, given that most studies have considered risk factors of atypical eating behaviours independently, the hypothesis regarding which risk factors mediated the relationship between OC symptoms and atypical eating behaviours remained exploratory.

Method

Ethical approval, participants and procedure

Ethical approvals, participants and study procedures were the same as in Part 1.

Measures

In addition to the OCI-R and atypical eating behaviour measures used in Part I (NIAS total, EAT-26 total, AEBQ-FF and APEQ), participants completed the following measures, which assessed potential mediators of atypical eating behaviours:

Perfectionism

Perfectionism was assessed using the brief version of the FMPS (FMPS-B; Woodfin et al., 2020). Unlike the original FMPS, which has 35 items, the FMPS-B has only eight items to measure two dimensions of perfectionism: evaluative concerns (FMPS-EC), referring to the generalisation that one's failures or

mistakes are attributed to their self-worth, and strivings (FMPS-S), which refers to having high expectations for oneself. Example items include *'if I fail at work/school, I am a failure as a person'* (FMPS-EC) and *'I set higher goals for myself than most people'* (FMPS-S). Participants indicate their agreement with each item using a five-item Likert scale, ranging from '*1 – Strongly Disagree'* to '*5 – Strongly Agree*'. All eight items are summed to provide an overall score, which ranges between 8-40, and subscale scores range between 4-20; higher scores are indicative of more perfectionistic tendencies. The developers of the FMPS-B observed good internal consistency (α = 0.83) and similar findings were found in the current study: FMPS-EC, α = .827; FMPS-S α =.874. The total FMPS-B score was used in the analysis.

Emotion regulation

Difficulties with emotion regulation were assessed using the DERS-18 (Victor & Klonsky, 2016), which was also used in Chapter 5. DERS-18 total scores range between 18 and 90, with greater scores suggesting more difficulties with emotion regulation. Full details of the DERS-18 and its subscales are provided in Chapter 5. Reliability coefficients for the DERS-18 ranged between good and excellent (DERS-A, α = .746; DERS-C α = .806; DERS-S, α = .822; DERS-N, α = .868; DERS-G, α = .895; DERS-I, α = .909). Total DERS-18 scores were used in the current study.

Obsessive-compulsive personality traits

Traits of OCPD were assessed using the self-rated version of the CPAS (Fineberg et al., 2015). Total scores range between 0 and 32, and higher scores suggest a greater presence of OCPD traits. A comprehensive outline of the CPAS is provided in Chapter 5. Reliability coefficients determined that the CPAS had acceptable internal reliability in the present study (α = .755).

Anxiety

Symptoms of anxiety were assessed using the GAD-7, which is a brief, seven-item questionnaire (Spitzer et al., 2006). The GAD-7 total score ranges between 0 and 21, with greater scores suggesting more severe anxiety symptoms. Full details of this measure are presented in Chapter 5. The GAD-7 demonstrated excellent internal reliability in the current study (α = .913).

Sensory sensitivity

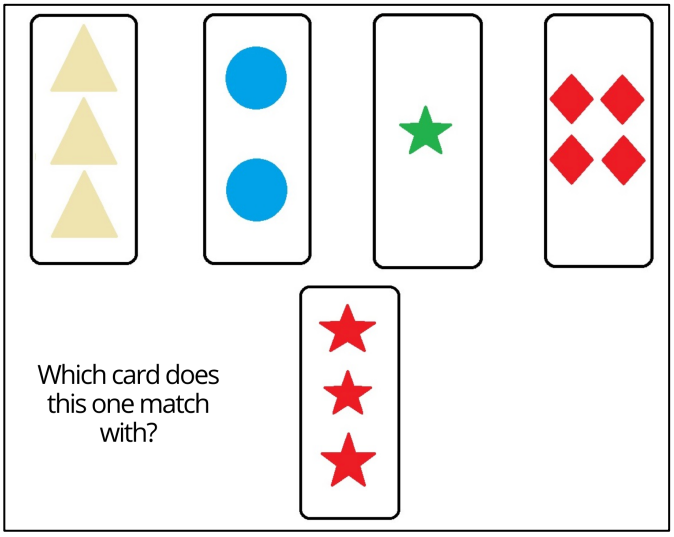
Sensory sensitivity was assessed using the SPQ-35 (Tavassoli et al., 2014). Total SPQ-35 scores range between 0 and 140; greater scores suggest more hyposensitivity, whereas lower scores denote hypersensitivity. Full details of the SPQ-35 are provided in Chapter 5. In the current study, internal reliability for the SPQ-smell (α =.782) and SPQ-touch subscales (α =.822) were acceptable and good, respectively. However, the SPQ-taste subscale had poor internal reliability (α = .522), and the SPQ-vision (α =.671) and SPQ-hearing subscales (α = .699) had questionable internal reliability. Total SPQ-35 scores were used in the analysis.

Cognitive rigidity

Cognitive rigidity was assessed using the Wisconsin Card Sorting Test (WCST; Grant & Berg, 1948), which is the gold standard tool to measure neuropsychological functioning associated with set-shifting and cognitive rigidity. Participants are presented with a task where they are requested to match a target card to one of four other cards. To successfully match the target card, the participant must predict the matching rule; matching rules may refer to colour (e.g., matching red with red), shape (e.g., matching a triangle with a triangle) or number (e.g., matching three shapes with another set of three shapes). Participants are tasked with matching the target card 64 times. An example of the matching task is displayed in Figure 6.1. Completing the task provides three types of scores: perseverative errors (participant perseveres with their predicted matching rule despite being informed this is incorrect), failure to maintain set errors (making an error despite correctly matching in the previous round, or returning to a previous matching rule), random errors (errors which are not perseverative or failure to maintain set), and total errors (the total of perseverative errors, failure to maintain set errors and random errors). Scores for perseverative errors were used in the current study; greater scores indicate greater difficulties with cognitive rigidity and set shifting.

Figure 6.1.

The Wisconsin Card Sorting Task



Impulsivity

Impulsivity was assessed using the shortened version of the Barrat-Impulsiveness Scale-11 (Patton et al., 1995), known as the Barratt Impulsiveness Scale-15 (BIS-15; Spinella, 2007). The scale contains a total of 15 items which assess impulsivity across three subscales: attention impulsivity (BIS-A), motor impulsivity (BIS-M) and non-planning (BIS-NP). Examples of items include *'I am restless at lectures and talks'* (BIS-A), *'I act on spur of the moment'* (BIS-M) and *'I am a careful thinker'* (reversed item, BIS-NP). Participants rate each item on a four-point Likert scale ranging between *'1 – Rarely/Never'* and *'4 – Almost Always'*. Scores are totalled, and reversed where necessary, to provide an overall impulsivity score, ranging between 15 and 60, or individual subscale scores which range from 5 to 20. Higher scores indicate higher levels of impulsivity. Developers of the scale observed acceptable

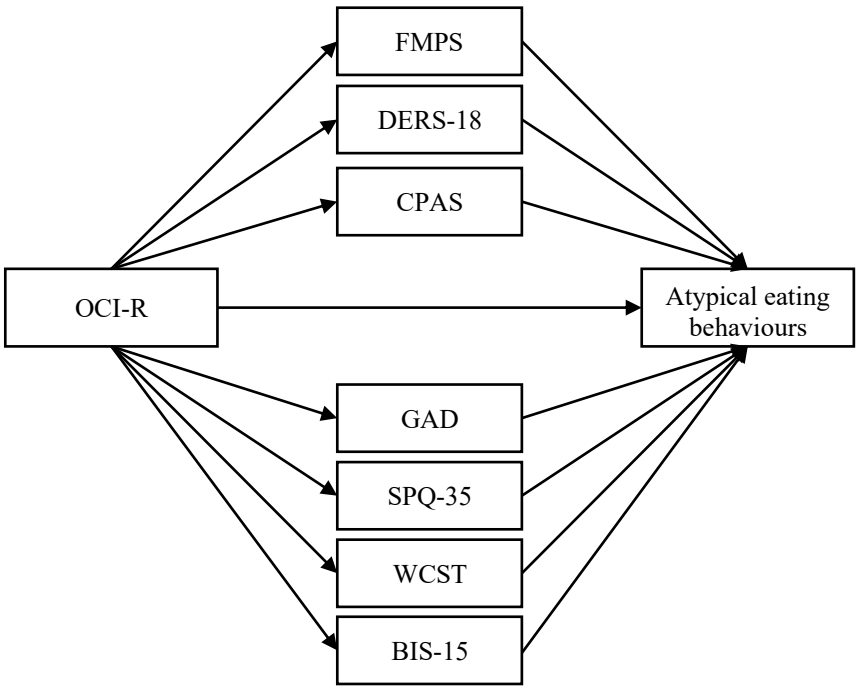
reliability for the BIS-15 (α =.79; Spinella, 2007). However, the current study found reliability coefficients ranging between unacceptable to acceptable (BIS-M, α =.183; BIS-NP, α = .672; BIS-A, α = .729). The current study utilised total BIS-15 scores.

Statistical analysis

All analyses were conducted using SPSS IBM Version 29 (SPSS Inc., Chicago, IL, USA). A series of linear regressions were first carried out to examine whether each potential mediator (FMPS-B, DERS-18, CPAS, GAD-7, SPQ-35, WCST and BIS-15) could independently predict eating disorder symptoms (NIAS total and EAT-26 total) and non-clinical selective eating behaviours (AEBQ-FF and APEQ). Thereafter, a set of four mediation analyses were computed following the guidance of Hayes (2022). The mediation analyses explored whether the relationship between the OCI-R total scores and the atypical eating behaviours could be explained by the potential mediators. The potential mediators were entered in parallel and the bootstrapping method of model 4 of the PROCESS macro and 10,000 repetitions were used. Figure 6.2 presents a theoretical diagram of the potential mediational relationship.

Figure 6.2.

A theoretical diagram of the potential mediational relationship between OC symptoms and atypical eating behaviours



Results

Sample statistics

Sample statistics for the OCD participants can be found in Part I. The data was complete for all measures, however WCST data was missing for five of the participants. Table 6.2.1 presents the means of the study variables.

Table 6.2.1.
Means of study variables

	OCD n=50	
	M	*SD*
OCI-R	31.84	14.63
Atypical eating behaviours		
NIAS total	15.70	11.38
EAT-26 total	11.58	11.52
AEBQ-FF	2.23	.83
APEQ	2.19	.84
Potential mediators		
FMPS-B	30.44	5.18
DERS-18	52.50	10.83
GAD-7	11.92	5.48
CPAS	13.96	5.61
SPQ-35	43.72	16.21
WCST	10.62	4.42
BIS-15	34.49	6.29

Note: OCI-R = Obsessive-Compulsive Inventory-Revised; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating Questionnaire, FMPS-B= Frost Multidimensional Perfectionism – Brief version; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; WCST = Wisconsin Card Sorting Test; BIS-15 = Barrat Impulsiveness Scale-15.

Linear regression analyses

A series of linear regressions were carried out with each potential mediator as individual predictors of atypical eating behaviours. Assumption testing indicated that the dependent variables were not normally distributed, although this was expected given the nature of the measures. Most mediators, except for the FMPS, WCST-P and DERS-18, significantly correlated with the outcome variables. Probability-Plots suggested normality of the residuals for the NIAS and AEBQ-FF, however there were some deviations for the EAT-26 and APEQ. Standard residuals were within range, however for the EAT-26 some did exceed 4. Despite this, Cook's distance values were below 1, suggesting that no individual cases influenced the regressions.

The regressions indicated that greater GAD-7, CPAS and BIS-15 scores, denoting heightened anxiety, OCPD symptoms and impulsivity, respectively, could predict NIAS total scores. Moreover, lower SPQ-35 scores, indicating greater hypersensitivity, could also predict NIAS total scores. The EAT-26 scores

were predicted by elevated levels of FMPS-B (perfectionism), GAD-7 (anxiety) and CPAS (OCPD symptoms) and lower levels of the SPQ-35 (hypersensitivity).

Only lower SPQ-35 scores, indicative of hypersensitivity, could predict the AEBQ-FF. Lastly, the APEQ could be predicted by greater scores on the DERS-18 (emotion dysregulation), GAD-7 (anxiety), CPAS (OCPD traits) and BIS-15 (impulsivity), and lower scores on the SPQ-35 (hypersensitivity). A summary of the linear regressions is displayed in Table 6.2.2.

Table 6.2.2.
Summary of linear regression analyses for potential mediators predicting atypical eating behaviours

	β	R^2	*F*	*p*
NIAS total				
FMPS-B	1.64	.027	1.325	.255
DERS-18	.197	.039	1.931	.171
GAD-7	**.339**	.115	6.232	**.016**
CPAS	**.342**	.117	6.372	**.015***
SPQ-35	**-.492**	.242	15.317	**<.001****
WCST	.183	.034	1.498	.228
BIS-15	.417	.174	10.113	**.003****
EAT-26 total				
FMPS-B	**.403**	.162	9.301	**.004****
DERS-18	.193	.037	1.864	.178
GAD-7	**.471**	.222	13.700	**<.001****
CPAS	**.334**	.111	6.020	**.018***
SPQ-35	**-.389**	.151	8.538	**.005****
WCST	-.036	.001	.055	.816
BIS-15	.236	.056	2.833	.099
AEBQ-FF				
FMPS-B	.130	.017	.823	.369
DERS-18	.043	.002	.087	.769
GAD-7	.253	.064	3.294	.076
CPAS	.236	.056	2.824	.099
SPQ-35	**-.373**	.139	7.764	**.008****
WCST	-.008	.000	.003	.960
BIS-15	.278	.077	.058	.051
APEQ				
FMPS-B	.223	.050	2.510	.120
DERS-18	**.351**	.123	6.729	**.013***
GAD-7	**.296**	.088	4.611	**.037***
CPAS	**.480**	.231	14.407	**<.001****
SPQ-35	**-.661**	.437	37.318	**<.001****
WCST	.185	.034	1.531	.223
BIS-15	**.449**	.202	12.129	**.001****

Note: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating Questionnaire, FMPS-B= Frost Multidimensional Perfectionism – Brief version; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; WCST = Wisconsin Card Sorting Test; BIS-15 = Barrat Impulsiveness Scale-15.

Mediation analyses

Finally, parallel mediation analyses were carried out to examine whether alternative variables mediated the relationship between OC symptoms and atypical eating behaviours. Prior to this, assumption testing was carried out. The dependent variables did not have a normal distribution, as indicated by the Shapiro-Wilk Test; however, this finding was not unexpected. The potential mediators shared a relationship with the OCI-R, but tolerance values exceeded .35 and VIF values were below 2.8 indicating that multicollinearity did not pose any concerns. See table 6.2.3. for tolerance and VIF values. All the mediators correlated with APEQ, and most correlated with the NIAS and EAT-26. However, fewer shared an association with the AEBQ-FF. Inspection of Probability-Plots suggested that the residuals were normally distributed, however standard residuals for AEBQ-FF fell below -3. Despite this, all Cook's distance values were below 1, suggesting that individual cases did not affect the mediations.

Table 6.2.3.
Tolerance and VIF values for predictors across the mediators

Mediator	Tolerance	VIF
OCI-R	.560	1.786
FMPS-B	.705	1.419
DERS-18	.583	1.715
GAD-7	.723	1.383
CPAS	.353	2.832
SPQ-35	.658	1.521
WCST	.954	1.048
BIS-15	.719	1.390

Note: OCI-R = Obsessive-Compulsive Inventory-Revised; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating Questionnaire, FMPS-B= Frost Multidimensional Perfectionism – Brief version; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; WCST = Wisconsin Card Sorting Test; BIS-15 = Barrat Impulsiveness Scale-15

The total effect models were significant, indicating that the OCI-R predicted each of the atypical eating behaviours before accounting for the mediators.

The SPQ-35 fully mediated the relationship between the OCI-R and EAT-26, where those with greater OC symptoms, but lower levels of sensory sensitivity, were more likely to present with eating disorder symptoms associated with anorexia nervosa and bulimia nervosa (β = .0977, LLCI-UCLI = .0263 - .2028).

A partial mediation was observed for the OCI-R and APEQ, whereby those with greater levels of OC symptoms, who had lower levels of sensory hypersensitivity, were more likely to be selective eaters (β = .0060, LLCI-UCLI = .0006 - .0118). However, OC symptoms, still had a direct effect on selective eating behaviours when controlling for all the potential mediators (β = .0175, *p*= .0161)

Mediations were not observed for the relationship between the OCI-R and NIAS, and the OCI-R and AEBQ-FF. A summary of the mediation analyses is presented in Table 6.2.4.

Table 6.2.4.
Mediation analyses summary for atypical eating behaviours

	Total effect OCI-R total → atypical eating behaviour Coeff. *(p)*	**Direct effect** OCI-R total → atypical eating behaviour Coeff. *(p)*	**Relationship** OCI-R → potential mediators → atypical eating behaviour	**Indirect effect** Coeff. (95% LLCI-ULCI)		**Conclusion**
NIAS total	**.3205 (.0019)**	.0566 (.6103)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / WCST → BIS-15 → NIAS total	FMPS	.0162 (-.0462 - .1041)	**Total effect model is significant**
				DERS-18	-.0263 (-.1086 - .0162)	
				CPAS	.0772 (-.0986 - .2422)	No direct effect of OCI-R
				GAD-7	.0308 (-.0136 - .1437)	
				SPQ-35	.0817 (-.0111 - .1768)	**No mediation observed**
				WCST	.0048 (-.0261 - .0501)	
				BIS-15	.0795 (-.0135 - .1749))	
EAT-26 total	**.2250 (.0199)**	.0090 (.9277)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / WCST → BIS-15 → EAT-26 total	FMPS	.0901 (-.0065 - .2331)	
				DERS-18	-.0253 (-.0989 - .0205)	**Total effect model is significant**
				CPAS	-.0634 (-.2383 - .0308)	
				GAD-7	.0781 (-.0071 - .2137)	No direct effect of OCI-R
				SPQ-35	**.0977 (.0263 - .2028)**	
				WCST	-.0012 (-.0298 - .0196)	**Full mediation observed (SPQ-35)**
				BIS-15	.0401 (-.0184 - .1143)	
AEBQ-FF	**.0163 (.0387)**	.0020 (.8396)	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / WCST → BIS-15 → AEBQ-FF	FMPS	.0015 (-.0042 - .0088)	
				DERS-18	-.0034 (-.0126 - .0012)	**Total effect model is significant**
				CPAS	.0030 (-.0082 - .0162)	
				GAD-7	.0022 (-.0022 .0104)	No direct effect of OCI-R
				SPQ-35	.0062 (-.0014 - .0182)	
				WCST	-.0001 (-.0026 - .0024)	No mediation observed
				BIS-15	.0048 (-.0017 - .0132)	
APEQ total	**.0345 (<.001)**	**.0175 (.0161)**	OCI-R → FMPS / DERS-18 / CPAS / GAD / SPQ-35 / WCST → BIS-15 → NIAS APEQ	FMPS	.0008 (-.0046 - .0048)	
				DERS-18	.0006 (-.0031 - .0033)	**Total effect model is significant**
				CPAS	.0037 (-.0052 - .0153)	
				GAD-7	.0001 (-.0053 - .0046)	**Direct effect of OCI-R**
				SPQ-35	**.0060 (.0006 - .0118)**	
				WCST	.0004 (-.0022 - .0036)	**Partial mediation observed (SPQ-35)**
				BIS-15	.0055 (-.006 - .0126)	

Note: Items in bold represent a significant effect

OCI-R = Obsessive-Compulsive Inventory-Revised; NIAS total = Nine-Item Avoidant/Restrictive Eating Disorder Screen total score; EAT-26 total = Eating Attitudes Test-26 total score; AEBQ-FF = Adult Eating Behaviour Questionnaire-Food Fussiness subscale; APEQ total – Adult Picky Eating Questionnaire, FMPS-B= Frost Multidimensional Perfectionism – Brief version; DERS-18 total = Difficulties in Emotion Regulation Scale – 18 item total score; CPAS = Compulsive Personality Assessment Scale; GAD-7 = Generalised Anxiety Disorder Assessment; SPQ-35 total = Sensory Perception Quotient – 35 item total score; WCST = Wisconsin Card Sorting Test; BIS-15 = Barrat Impulsiveness Scale-15

Analysis summary

A full mediation was observed between anorexia nervosa and bulimia nervosa symptoms and OC symptoms; those with elevated OC symptoms, showing reduced sensory sensitivity, were more likely to engage in these eating behaviours. These findings suggested that reduced sensory sensitivity may underlie the relationship between OC symptoms and anorexia nervosa and bulimia nervosa symptoms in those with OCD.

The relationship between OC symptoms and selective eating behaviours (assessed by the APEQ), was partially explained by reduced sensory sensitivity, such that those with greater OC symptoms, demonstrating lower sensory sensitivity, were more likely to engage in selective eating. As the mediation was only partial (i.e., does not explain 100% of the relationship), OC symptoms still directly influenced selective eating when controlling for these mediators. This suggested that the relationship between selective and OC symptoms was only partly underpinned by sensory sensitivity in those with OCD, with OC symptoms directly influencing this eating behaviour.

Discussion

The current findings provided partial support for the first hypothesis that OC symptoms alone would not predict atypical eating behaviours. A partial mediation was observed for OC symptoms and selective eating behaviours assessed by the APEQ; those with greater OC symptoms, who experienced reduced sensitivity, were more prone to non-clinical selective eating behaviours. However, OC symptoms also had a significant direct effect on selective eating when controlling for the alternative mediators, indicating that OC symptoms may have a central role in the presentation of selective eating among those with OCD, independent of rigidity and sensory factors as proposed by earlier research (Farrow & Coulthard, 2012; Zickgraf et al., 2022). Several studies, including that of Chapter 3, have also found that those who engage in selective eating are more likely to experience elevated OC symptoms, which supports the suggestion that non-clinical selective eating may be a behavioural expression of OCD (e.g., Barnhart et al., 2021; Kauer et al., 2015; Wildes et al., 2012).

The present study proposed that hyposensitivity was associated with selective eating in OCD, suggesting that adults with OCD may engage in selective eating because they are *less* reactive to environmental stimuli. Similar findings were reported in the general population study presented in Chapter 5, where reduced sensory sensitivity played an important role in the presentation of ARFID symptoms concerning a lack of appetite. Whilst selective eating is not synonymous with ARFID, which reflects clinical levels of food avoidance, it is considered within the category of food avoidance. Hence, sensory hyposensitivity may underpin a broader range of food avoidance behaviours linked to OC symptoms.

The findings for selective eating in the current study are inconsistent with existing research which suggests that selective eating in OCD is often driven by sensory *hypersensitivity* (i.e., over-responsiveness to stimuli), rather than *hyposensitivity* (i.e., reduced responses to stimuli; Zickgraf et al., 2022; Zickgraf & Elkins, 2018). This novel finding highlights the need to consider developmental and contextual factors when understanding the role of sensory sensitivities in eating among the OCD population. As existing studies have typically involved children, the difference in findings may reflect developmental changes in hypersensitivity, which appear to decrease with age (Ueno et al., 2019). It

has also been proposed that food avoidance established during childhood can persist into adulthood, possibly explaining why selective eating was present among adults with OCD, despite experiencing reduced hypersensitivity (Dovey et al., 2008; Pesch et al., 2020). With this in mind, it is important to recognise that the role of sensory sensitivity in atypical eating among those with OCD may change throughout the lifespan, transitioning from food avoidance driven by overstimulation in childhood to that associated with under-stimulation in adulthood. This enhances the current understanding of selective eating by suggesting that it may be driven by both *hypersensitivity* and *hyposensitivity*.

Concerning eating disorder symptoms, no mediation effects were found for OC symptoms and ARFID, contrasting that of Chapter 5 which examined the same relationship in the general population. The association between OC symptoms and anorexia nervosa and bulimia nervosa symptoms was fully mediated by reduced hypersensitivity, providing support for the study hypothesis that a mediation would exist; those with more severe OC symptoms, who exhibited lower levels of hypersensitivity (i.e., hyposensitivity), were more likely to engage in these eating behaviours. Again, this contrasts the findings of Chapter 5 where perfectionism and emotion dysregulation mediated the relationships between OC symptoms and anorexia nervosa and bulimia nervosa symptoms. As a result, it can be proposed that the pathways linking OC symptoms to atypical eating behaviours may differ between individuals with OCD and those in the general population; sensory processing may be a more salient factor for atypical eating among those with OCD, whereas cognitive or emotion-related factors may be more related to these behaviours in adults of the general population.

Other studies have proposed that sensory *hypersensitivity* is prominent among those with anorexia nervosa and is related to more severe eating disorder symptoms and lower BMI, whereas the current study suggests that *hyposensitivity* is implicated with anorexic and bulimic symptoms in OCD (Merwin et al., 2013; Saure et al., 2022; Zucker et al., 2013). The difference in findings may result from the use of the EAT-26 in the current study, which considers eating disorder symptoms related to both anorexia nervosa and bulimia nervosa. Evidence highlights that those with anorexia nervosa are typically more hypersensitive compared to those with bulimia nervosa. Therefore, future research should independently assess the contribution of sensory sensitivity to anorexic and bulimic behaviours in OCD to better understand their distinct sensory profiles (Brand-Gothelf et al., 2016; Cobbaert et al., 2024).

There are some limitations to consider in the context of the current findings. The present study only considered certain factors of interest, but it is important to note that other factors, such as social media use, cultural expectations and eating attitudes of parents and peers, may also contribute towards eating pathologies (Dondzilo et al., 2024; Doris et al., 2015; Linville et al., 2011; Quiles Marcos et al., 2013). Moreover, it would be important to examine neurocognitive impulsivity, as it has been suggested that a lack of inhibitory control is unique to OCD, rather than anorexia nervosa (Boisseau et al., 2012). The atypical eating measures used were not validated for use in OCD specifically; consequently, they may not capture the nuances of atypical eating in OCD. However, an important advantage of the study was the use of the WCST, which objectively assessed the neurocognitive basis of cognitive rigidity. Unlike self-report measures of cognitive rigidity, objective measures are said to be more accurate in determining deficits in executive functioning (Howlett et al., 2021, 2023).

In summary, the present findings provide evidence to suggest that sensory *hyposensitivity*, rather than *hypersensitivity*, may play an important role in the expression of atypical eating behaviours related to anorexia nervosa and bulimia nervosa and non-clinical selective eating in adults with OCD.

Chapter 7: A qualitative exploration of eating behaviours in females with obsessive-compulsive disorder

*Under review with PLOS ONE

Overview

Previous research, including that of the thesis, has identified that OC symptoms in those with and without OCD, are associated with a range of atypical eating behaviours. Research exploring atypical eating behaviours has primarily adopted the use of quantitative methodologies; however, qualitative methods may offer unique insights into the eating experiences of adults with OCD. The present study explored atypical eating in 11 females with OCD, drawing attention to their challenges with eating, the unique impact of OC symptomatology on eating, and their experiences with healthcare services.

Introduction

Existing research has highlighted an association between OCD and atypical eating behaviours; this includes eating disorders, as well as non-clinical atypical eating behaviours, such as selective eating (e.g., Bang et al., 2020; Garcia et al., 2020; Wildes et al., 2012; Zickgraf et al., 2016). However, the current literature base is limited and lacks the understanding of these eating behaviours in OCD specifically. The present thesis has attempted to address some of these limitations by examining the relationship between OC symptoms and the wider spectrum of atypical eating behaviours, including ARFID and non-clinical atypical eating patterns. Moreover, Chapters 5 and 6 explored which factors may underlie the relationship between OC symptoms and atypical eating behaviours. Despite this, there are still gaps in the understanding of atypical eating in OCD.

A core limitation of the thesis thus far is the use of pre-existing questionnaires, such as the EAT-26 or NIAS, which are not validated for use in OCD to assess atypical eating behaviours. Consequently, the measures used may not comprehensively capture the atypical eating behaviours present in OCD or related to OC symptoms. Additionally, while these existing measures may detect eating behaviours, they offer little insight into the impact of these eating patterns on individuals diagnosed with OCD.

Qualitative research may be an alternative methodology to address these gaps in knowledge, rather than quantitative methods, which have been used in existing research and the thesis thus far. Quantitative research enumerates thoughts and behaviours to allow for statistical analysis, whereas qualitative research focuses on non-numerical data to understand thoughts and behaviours from the perspectives of those investigated (Gelo et al., 2008).

There has been longstanding debate regarding the use of quantitative versus qualitative methodology in research. Quantitative methods are the most used methodology in psychological research; however, they have been criticised for limiting meaningful theoretical interpretation, as they reduce the understanding of phenomena to discrete variables, which are often surface level and may conceal rich data (Gelo et al., 2008). In addition, quantitative methodologies rely on the validity of measurement tools to accurately assess phenomena, which is not always possible when the measures are used in different contexts; for instance, when understanding atypical eating behaviours in OCD. Alternatively, qualitative research allows participants to communicate their experiences without reducing their

answers to preconceived categories or frameworks (Sofaer, 1999). As a result, qualitative data can be richer and allow for a deeper understanding, which quantitative data may not be able to achieve. This method is particularly useful in areas where there is little existing research, such as atypical eating in OCD (Palinkas, 2014).

Qualitative studies have been useful for understanding atypical eating behaviours in other clinical populations. For example, a study by Mueller-Stierlin and colleagues (2022) observed that individuals with serious mental illnesses engaged in atypical eating as a means of coping with mental health challenges. Different ways of coping involved abstaining from foods during difficult periods to regain control, or as a method of self-harm. In a separate study, difficulties in daily living were also found to contribute to atypical eating behaviours in individuals with serious mental illnesses. These difficulties included challenges with planning, lack of structure or drive, depression, anxiety and medication side effects, all of which made it more challenging for participants to engage in healthier eating behaviours (Mueller-Stierlin et al., 2022). The study also included a participant with OCD, who reported that when their OC symptoms were more severe, they had fewer cognitive resources to pay attention to eating.

Another qualitative study involved adolescents with Tourette syndrome. Adolescents with Tourette syndrome reported that sensory preferences shaped their food choices and eating routines. This involved avoiding foods due to sensory properties or having specific preferences around meal presentation (Bamigbade et al., 2024). Participants also reported that their preferences for food did not make their diets more restrictive, which challenges quantitative research suggesting that those with Tourette syndrome have more limited diets.

To enhance the findings of the quantitative studies presented in Chapters 3–6, the current study proposed a qualitative exploration of eating experiences in adults with OCD. The present study involved participants completing a one-off semi-structured interview, which focused on their experiences of eating in OCD and the impact of OCD on eating behaviours. Reflexive Thematic Analysis, following the guidance of Braun and Clarke (2022), was the chosen method of qualitative analysis as it allows the researcher to study the experiences of participants, whilst also considering their own knowledge and pre-existing research of atypical eating.

Methods

Ethical approval

Ethical approvals were the same as that in Chapter 6.

Participants

Participants with OCD, who completed the study described in Chapter 6 and agreed to be contacted about an interview study, were invited to participate. The same inclusion criteria as Chapter 6 were followed and a maximum sample size of 12 was sought.

Data collection

Participants who agreed to be contacted for the study were invited to participate and sent a copy of the participation sheet via email (Appendix 26). Those expressing an interest in the study were given the opportunity to consider participating and ask the researcher further questions, which was facilitated by email or telephone. Prior to the booked interview, participants were asked if their demographic details could be obtained from the data they had provided in the earlier questionnaire study; all participants agreed.

All interviews took place on Microsoft Teams. Before beginning the interview, participants were asked if they had any questions about the study before proceeding. Thereafter, a verbal consent form was completed alongside the researcher (Appendix 27). Prior to beginning the interview, the researcher provided a brief introduction to the interview topic and the terms used (e.g., food fussiness or picky eating), as familiarity with the research topic can enhance understanding of the interview response and coherence of the interpretation (Kobori et al., 2012). After the researcher reaffirmed confidentiality and the right to withdraw, participants were asked if they were ready to proceed, after which they were informed that the digital audio recording and transcription would begin.

A series of semi-structured interview questions and prompts were used during the interview. The interview guide, presented in Table 7.1, was developed by the lead researcher and principal supervisor to understand atypical eating behaviours from the perspective of those with OCD. Core questions addressed in the semi-structured interview included diet and food preferences, childhood eating experiences, challenges with eating, the impact of OCD on eating, and experiences with health services concerning eating.

The interviews ranged between 26 and 69 minutes. Upon completion of the interview, participants were thanked for their time and provided with a copy of their consent form in a password protected document. Participants were also given a £10 gift voucher for participating.

Table 7.1.
Interview guide for OCD participants

Semi-structured interview guide and prompts
1. Can you tell me a bit about your OCD symptoms? a. What symptoms do you have (e.g., washing, orderliness)? b. When did your symptoms first start?
2. Giving examples, can you describe what you feel to be the main challenges your OCD has on your daily life?
3. How would you describe your diet? a. For example, would you describe your diet as healthy or balanced?
4. Can you tell me a bit about your eating habits? a. For example, picky eating or fussiness with food b. Can you tell me about your eating patterns (e.g., time of the day)?
5. Can you tell me about the type foods you like and dislike? a. What is it that you like or dislike about these foods?
6. Please can you describe any challenges that you have had with your eating?

a. For example, over- or undereating, restricting foods, compensatory behaviours, food avoidance, planning or preparing meals

7. Can you outline whether you think your OCD has had any impact on your eating habits in daily life?
    a. How does having OCD effect your food choices?
    b. What impact does OCD have on preparing foods and mealtimes?
    c. Can you describe any rituals or compulsions you have that are related to eating, your food choices or meal preparation?
    d. How does your OCD impact eating outside of home?

8. Following OCD medication, can you describe, if any, resulting changes in your eating habits and mealtimes?

9. During the pandemic did you perceive any noticeable changes in your eating patterns?
    a. If yes, can you explain whether these changes were related to your OCD symptoms?

10. Has a healthcare professional ever asked you about your eating behaviours; for example, a psychiatrist or therapist? If yes, what prompted them to ask you?

11. Have you ever received support for your eating?
    a. If yes, please describe what support you have received
    b. Can you explain whether you thought you needed, or wanted, support for your eating?

12. What would you like healthcare professionals to know about eating as an adult with OCD?

13. What advice would you give to anyone who may struggle with both OCD and eating challenges?

14. Is there anything else related to your eating behaviours that we have not covered in the interview?

Data analysis

All interviews were transcribed verbatim using Microsoft Teams and then edited by the lead researcher to ensure accuracy of the transcripts. Thereafter, the qualitative data were analysed using reflexive thematic analysis, following the guidance of Braun and Clarke (2022). At its core, thematic analysis is a method that guides the researcher to interpret patterns and shared meanings across a qualitative dataset. Reflexive thematic analysis extends thematic analysis to highlight the role of the researcher within the analysis; the researcher is to critically consider the impact of their own knowledge and assumptions, as well as their position within the study. Rather than viewing researcher subjectivity as a bias to be minimised, Braun and Clarke (2022) consider it key to successful reflexive thematic analysis when the researcher can acknowledge their subjectivity and critically engage with it. As researcher subjectivity is core to the reflexive thematic analysis process, it is not necessary to have multiple analysts. The six phases of reflexive thematic analysis are described below:

Phase 1: Familiarisation

The first step of reflexive thematic analysis involves familiarisation with the data set. This includes reading interview transcripts and listening to audio recordings of the interviews several times. It is important for the researcher to engage with the data on an immersive level (i.e., familiarising oneself with the experiences of the participants) and on a critical level to explore and question the data. Critical examination of the data is key to achieving analytic sensibility, which refers to understanding the data beyond surface level content and recognising its association with existing research or theoretical

concepts. At this stage, it is recommended that the researcher notes down initial analytic thoughts, either through lists, doodles, mind maps or other preferred formats. In the current study, analytic thoughts were noted in list form for each transcript.

Phase 2: Generating codes

The coding stage involves identifying meaningful and interesting parts of the data which are relevant to the research question, which in this case was 'what are the eating experiences of adults with OCD'? These parts of interest are then coded; codes attached to the transcript may be semantic or latent, with semantic codes capturing the surface-level content of the data, and latent codes exploring the implicit meaning of the data. Such codes may be inductive and driven by the data, or deductive where they reflect on theories or existing research. Neither semantic nor latent codes, or inductive and deductive approaches, are considered a dichotomy; rather, they represent a continuum of data exploration. In the present study, a combination of semantic and latent codes, and inductive and deductive approaches, were used.

Braun and Clarke (2022) propose that coding should be completed at least twice for each transcript; this allows for a more thorough analysis and acknowledges how codes may evolve throughout the coding process. In the current study, code generation was completed in Microsoft Word.

Phase 3: Generating themes

Theme generation begins when the dataset has been thoroughly coded. The key aim of theme generation is to identify patterns throughout the dataset. To achieve this, clusters of codes that share meaning are combined to address the research question. Themes do not 'emerge' from the data but are constructed by the researcher. As reflexive thematic analysis is a recursive process, revisiting the coding stage may be needed to refine the codes during the provisional development of themes. Visual mapping techniques can be used to understand how codes cluster together and form provisional themes in the wider context of the data. Whilst themes may relate to one another, it is important that there is a distinction between them.

Phase 4: Reviewing themes

Phase 4 extends the theme development stage to ensure that the provisional themes are appropriately related to the research question. Themes must be related to coded extracts of the transcript, as well as the dataset as a whole. During this stage, researchers should also consider how the themes map onto existing research, theories or ideas. Braun and Clarke (2022) suggest that themes should be built around a central idea, but exist independently, whilst also being interlinked to address the research question. At this stage, it is possible that some themes may be discarded or merged, and some themes may need to be redeveloped. Ultimately, themes should be comprehensive and coherent, without reading as a topic summary of the data. Researchers may also choose to return to the coding phase during this process.

Phase 5: Defining and naming themes

The fifth phase of reflexive thematic analysis involves defining and carefully considering each theme's boundaries and position within the overall analysis in relation to the research question. Each theme must be clearly demarcated. Difficulties in defining each theme may also highlight themes that are too broad or need adjustment to fit within the overall analysis. An ideal definition would delineate the purpose of the theme (and potentially subthemes) within the central idea of the analysis, and highlight what makes the theme different from other themes in the analysis. A brief summarising title is also provided for each theme and subtheme.

Phase 6: Writing up the analysis

The final stage involves writing up the reflexive thematic analysis. An informal write up of the dataset usually begins in Phase 3 where themes are generated. However, when moving towards the end of the analysis, a more refined description of the themes and subthemes is provided. Themes and subthemes are explained in the context of the analysis, with the addition of quotes to evidence each theme or subtheme.

Member checking

Once the analysis is complete, it is recommended to provide participants with a copy of the final results for member checking (Varpio et al., 2017). Member checking of the final themes allows participants to confirm whether the analysis accurately reflected their experiences (O'Brien, Harris, Beckman, Reed and Cook, 2014). In the current study, no changes were requested and participants agreed that the analysis provided an accurate summary of their experiences.

Results

Participant details

A total of 11 participants, all female and aged between 20 and 45 years (M = 31.63, SD = 9.38), took part in the current study. Of the 11 participants, nine were from white ethnic and ancestral backgrounds (British n = 8; Irish n = 1) and one was from an Indian ethnic and ancestral background. Ethnicity and/or ancestral background was not reported for one participant.

All the participants, except one, had a formal diagnosis of OCD; the participant without a formal diagnosis had received treatment for OCD and had been told by a healthcare professional that she had OCD. The participants, as a group, scored above the clinical threshold (M = 29.2; SD = 19.57) on the Obsessive-Compulsive Inventory-Revised (OCI-R, Foa et al., 2002). Given that OC symptoms wax and wane in presentation, not all participants exceeded the OCI-R threshold at the time of completion (n = 4). Moreover, all participants reported having received treatment for OCD at some point during their lifetime, six of whom reported currently undergoing treatment for OCD (pharmacological intervention n = 4; psychological therapies n = 1; combined pharmacological and psychological intervention n = 1). Eight of the 11 participants reported a co-occurring condition; these details are presented in Table 7.2.

Of the 11 participants, 10 reported experiencing difficulties with their eating behaviours to varying degrees. One participant did not feel that their eating behaviours were affected by OCD. Table 7.2 summarises the participant reported atypical eating behaviours.

Table 7.2.
Participant details

Participant	Age (years)	BMI	OCD symptoms	Co-occurring conditions	Eating disorder history
1	22	19.1	Contamination fears	Anxiety	No diagnosed eating disorder but significant food anxieties
2	30	19.0	Contamination fears and health anxieties	Anxiety and depression	Self-identified eating disorder symptoms
3	41	22.6	Obsessions	Social anxiety disorder and depression	Self-identified food addiction to sugary foods and drinks
4	29	26.2	Magical thinking, checking	None reported	None
5	27	21.5	Harm avoidance obsessions	None reported	None
6	20	23.1	Obsessions, reassurance seeking	None reported	None
7	20	13.7	Contamination fears, obsession about control	Emetophobia, autism spectrum disorder, ADHD, anxiety and depression	History of eating disorders and working diagnosis of ARFID
8	38	25.2	Harm avoidance, health anxiety obsessions, contamination fears	Depression and generalised anxiety disorder	None
9	31	18.1	Contamination fears	Emetophobia, depression	Borderline anorexia nervosa during adolescence
10	45	22.3	Obsessions, reassurance seeking	Depression	Self-identified eating disorder symptoms during adolescence
11	45	30.4	Contamination fears, orderliness	OCPD, hoarding disorder	Self-identified binge-eating disorder

Themes and subthemes

Three overarching themes were generated from the data; these are presented in Table 7.3. The first theme, ‘the hidden burden’, referred to the unrecognised eating difficulties faced by participants. ‘The importance of control’ highlighted the fine line between gaining and losing control when eating. Lastly, ‘the detrimental impact of OCD on eating’ described the negative effect of OCD on eating in day-to-day life. Each of these themes and subthemes are described in the following section.

Table 7.3.
Themes and subthemes generated from interviews of OCD participants

Themes and subthemes
The hidden burden
1. Eating behaviours as a by-product of OCD
2. It's not always as it seems
3. Lack of support for eating
The importance of control
4. Gaining control
5. Losing control
The detrimental impact of OCD on eating
6. Effects on daily living
7. Eating outside of home
8. Life through the lens of OCD

Theme 1: The hidden burden

The first theme represented the hidden eating difficulties faced by the adults with OCD; many believed their OCD was a catalyst for their eating difficulties. They also spoke of a disconnect whereby visible manifestations of eating (e.g., eating healthily or being of a healthy weight) masked the challenges that they faced.

Subtheme 1: Eating behaviours as a by-product of OCD

Although eating behaviours were not always the primary presenting issue, many of the participants reported that their eating was directly affected by their OC symptoms:

> *In terms of the contamination, it has influenced what I eat… I've cut out things at times due to whatever was in the news (8)*

> *If I thought I had any red on my plate, I would associate that as being something to do with blood and that it was contaminated, and I couldn't eat it (2)*

Moreover, Participant 5 felt that she experienced more atypical eating behaviours when her OC symptoms were more severe: "*I would say definitely when my OCD is in general more stressful, I have a lot more symptoms and then some of those symptoms are like the eating ones."*

In cases of low mood or milder distress, participants would report more overeating as a form of comfort. However, when participants felt intense anxiety or distress, they were more likely to undereat:

> *I think if I'm really distressed, it's like you forget food. But if I'm like, just kind of low, I hit [sugary foods and drinks] like an alcoholic hitting the bottle (3)*

Similarly, Participant 4 distinguished between when she would use eating as a form of comfort, and when she would be less likely to want to eat due to feeling distressed:

> *If I'm stressed and I don't know what to do with myself, or if I'm feeling guilty or particularly worried about something and a bit restless, then I probably want to eat. But, if I'm tired and frustrated, and maybe more tearful, then maybe I'd be less inclined to eat (4)*

Subtheme 2: It's not always as it seems

Another commonality among participants was that their difficulties with eating were not always visible. Therefore, this may have prevented others or even themselves from identifying issues with their eating behaviours or diet. For example, Participant 8 would receive compliments on her appearance, although her weight loss was caused by more severe OC symptoms:

> *It's very obvious when I'm mentally unwell because I lose a lot of weight…. lots of people would comment on it and they think oh, you look great, but I'm actually really unwell (8)*

Similarly, Participant 3 described her appearance as fit and healthy, despite acknowledging that her diet was restricted and largely consisted of sugary foods and drinks:

> *If someone looked at me, they would think I was fit and healthy (3)*

Some participants mentioned that having a balanced or healthy diet may have masked their challenges with eating. For example, although Participant 7 reported eating a balanced diet, this was only achieved through time consuming preparation:

> *I try to keep it balanced somehow … but at the same time it's restricted because the only way it finds the balance is through me doing everything in the background to freeze everything or to buy everything that's got really long dates (7)*

Another participant suspected that she had symptoms of an eating disorder, but she perceived these to be less serious as her diet was healthy:

> *Sometimes I think I have a borderline eating disorder issue. It's not like out of control because I eat a healthy diet and I'm not unwell (2)*

Subtheme 3: Lack of support for eating

Most participants felt that they did not receive support for their eating difficulties, despite expressing their challenges to healthcare professionals. For example, Participant 7, who had a history of eating disorders, described how her thoughts about her eating behaviours were not considered:

> *I only came to the conclusion that [my eating] was linked to OCD myself. I had to figure everything out myself. I had to put all the puzzle pieces together myself. It was really confusing and distressing to do so. But even when I did, they still didn't listen to me, and they still didn't even offer me different care or consideration when treating me (7)*

Another participant also described her weight as being a concern, but she did not receive any support:

> *When I started with my psychiatrist, I was very self-conscious of losing a lot of weight and it would have been something I would have probably brought up more than being asked. But I didn't get any support around it (8)*

Participant 10, who suspected that she had an eating disorder during adolescence, also felt that her difficulties with eating were unsupported by healthcare professionals. She suggested a necessity for healthcare professionals to understand how OCD affects individuals beyond their primary OC symptoms and to understand how the patterns of OCD may be linked to pathological eating patterns:

> *What I'd really want them to think about is not just what's presented in front of them in that moment, but to consider how some of these other things and the thinking patterns and the mental processes behind them could actually be quite similar (10)*

Participant 11, who self-identified as having binge-eating disorder, previously sought support for her eating behaviours but was told that she had already received a similar treatment for OCD. She also reported being told that the eating disorders service would not be able to support her as her BMI was in the high category:

> *I did ask them specifically about the eating disorders pathway and if that's something I could access for binge-eating disorder. They said the treatment would be CBT and you've had CBT … I did specifically inquire about eating disorder services, but I was told that the eating disorders services were only for people with low BMI and not those with high BMI (11)*

In the few cases where support was provided, participants felt disappointed that it did not consider the effect that OCD had on their eating. For example, Participant 9, who is of low weight and has a limited diet due to fears of contamination and emetophobia, was referred to a dietician who suggested that adding more calorie dense products to her foods would help her to gain weight. However, she would have preferred support which helped her to navigate difficulties with food preparation and eating: *"I was referred to a dietician actually and I didn't find it helpful at all."*

Theme 2: The importance of control

The need for control when eating or preparing meals was a recurring pattern identified amongst the participants. This included eating certain foods or having particular rituals around eating. In some cases, however, participants identified that their attempts to gain control became overwhelming and restrictive, indicating a fine line between gaining control and losing control.

Subtheme 1: Gaining control

Participants' eating behaviours were often adopted as method of gaining control during stressful periods, or to prevent negative events from happening. Some participants, such as Participant 1, described resorting to safe food during times of distress, *"If I'm very stressed or if I'm feeling very anxious, I do have certain foods that I'll go back to"*

For some, specific routines around food provided a sense of consistency during uncertain times. For instance, Participant 6 reported wanting to eat the same foods when her grandmother was hospital: *"every single day after that I really wanted that one meal every single day just to form a bit of a routine"*

Some participants also tried to control and prevent the negative consequences of eating, which included vomiting or becoming unwell. For example, Participant 1 would eat small bites of food to avoid choking: *"I'd take really small bites, like microscopic. That's why it would take me so long to eat. I just was so scared of choking."*

Compensatory behaviours, including restrictive dieting that is often associated with eating disorders, were also noted by a few participants. For example, Participant 2 described feelings of disgust after eating something she perceived to be fattening and had the urge to control this by restricting later meals.

> *I would feel really disgusted that I just sat and ate that. I would also feel really fat. I'd probably be thinking of the next meal and how I'm going to compensate for having eaten that (2)*

In contrast, Participant 5 explained that her eating behaviours were not used to compensate for weight gain. Rather, she described that eating behaviours were something she gain control over to provide a sense of security:

> *I've teetered on the edge of having eating symptoms and stuff, it's not because I think I'm going to get fat or anything. It's because it's just something that I can very easily control (5)*

Subtheme 2: Losing control

Whilst some participants used their eating behaviours as a method of gaining control, some acknowledged the restrictions posed by their OC symptoms led them to lose control of their eating behaviours. For example, Participant 9 explained that her OCD rituals concerning food preparation were initially used to gain control over becoming unwell, but recognised that these rituals were controlling her instead: "*You take all these steps to make sure you do have control, but actually, if you think about it, the OCD is controlling me."*

Similarly, Participant 7 described that she was unable to deviate from set routines involving food and meal preparation, indicating that she could not control her thoughts and compulsions:

> *I'm not just restricted by the type of food I eat or how I eat and things like that, I'm also restricted by time. So physically my body, my anxiety will not let me eat after 7:00 o'clock in the evening. Because for no reason whatsoever, 7:00 PM, even a second past, even 7:00 PM on the dot, I can't eat past 7:00 PM. (7)*

Participant 10 noted that her desire to have a consistent eating routine was driven by anxiety. She did not want to miss her meals as this could lead to feeling a lack of control, which she found stressful:

> *I can get quite anxious if I miss a meal as well. I find that really stressful. I don't quite know what I think's going to happen. (10)*

Participant 3 also described that her eating behaviours were not controlled: "*I've got an addiction and it's hard to stop it.*"

Theme 3: The detrimental impact of OCD on eating

The final theme represented the difficulties that OCD posed on eating, including the negative impact on daily life, as well as eating out of the home.

Subtheme 1: Effects on daily living

Many participants reported that the impact of OCD on eating also had negative effects on their daily lives. For Participant 10, her obsessive symptoms led her to have increased structure around her daily eating routines:

> *I can remember my day becoming structured around when I was going to be able to have something to eat and what that was going to be, and how I was going to avoid a situation where I might have to veer from that structure. (10)*

Some participants also noted that not only did their OCD have a negative impact on food preparation and dietary intake, but also recreational activities concerning food. For example, Participant 2 stopped baking: "*I never thought that I would be able to bake again because of the thoughts I had to do with contamination of food*". Moreover, Participant 9 would engage in reassurance seeking behaviours during food preparation as she questioned whether she would become unwell from undercooked food:

> *I do seek a lot of reassurance as well when I'm cooking or when I'm eating food. I will ask, does this look right? Does this taste right? Are you sure this is cooked properly? How long did you cook it for? And then I'll ask again. Will this make me ill? (9)*

Similarly, Participant 11's cleaning obsessions made it difficult for her to use the kitchen, which meant that she was unable to cook healthy and nutritious meals. Consequently, she often resorted to processed foods which she acknowledged were not ideal for her health:

> *I don't actually like [ready meals and processed foods], it's just the convenience of having it and the difficulty I have with making other types of food. If I prepare my own food, I have to sanitize the work surfaces, I'll have to clean the utensils and clean the kitchen and put them away afterwards. It's so exhausting, and then you have to deal with the leftovers (11)*

Some participants also felt guilty that their difficulties with OCD and eating had a negative impact on those around them.

> *It doesn't just affect me, but also the people around me. That brings on a lot of guilt and, in turn, just makes the routines more restrictive because I want to protect the people around me. But, it's restricting them. (7)*

It's not just impacting me, but others around me, which is really sad. My husband gets really anxious cooking because he doesn't know if I'm going to eat it or not, so now he carries out safety behaviours by overcooking food. (9)

Subtheme 2: Eating outside of the home

Eating outside of the home was further complicated by OCD, with many participants expressing concern about feeling unsafe outside of the controlled home environment. Participant 1, who experienced eating difficulties from a young age, felt that she was unable to challenge her obsessions when eating outside of home: *"At home obviously it's a very safe environment for me to challenge myself in, whereas outside it's not always."*

Similarly, participants described feeling anxious when eating outside of the home and would often try to find ways to make the situation feel safer for themselves:

Even if I was going out with my friends or something, I wouldn't have been able to. Even if we were going out for pizza, it would have been really stressful. I would have been thinking about what I could do to try and make it safe for me (10)

Eating out somewhere new fills me anxiety, because if someone's not recommended it, it's that thought of 'what if I get food poisoning?' So, before I go out to a restaurant, I will look at their hygiene rating and then if it's a four or five, I'll be like okay, that's fine (9)

For Participant 7, eating outside of the home caused much distress, leading her to engage in checking behaviours to ensure her environment was clean. Although she recognised that this was not socially appropriate, she would often be unaware of doing this as it became habitual:

I'm on really high alert and I check everything around me… even unconsciously, if I walk into someone else's kitchen, I will impulsively just check around the kitchen to make sure everything's clean…I know that it probably seems really rude and invasive, but I can't help it and a lot of the time I don't notice I'm doing it because I'm so used to doing it at home for myself. (7)

In contrast, some participants enjoyed eating outside of the home as it provided a distraction from their OCD thoughts. Participant 11, who had difficulties with preparing food, liked to eat out as she would not need to worry about cleaning up "*If you eat out you don't have to worry about washing up."*

I find it distracts me from the OCD and that the OCD voice is a lot quieter because there's other voices [socialising noise] in the room. I wouldn't avoid socialising for food or anything like that, I'd quite enjoy going to a restaurant. (4)

Subtheme 3: Life through the lens of OCD

Some participants offered an explanation as to why OCD impacted their daily lives and eating behaviours. They described that their perceptions of the world were altered by their OCD, which led them to doubt reality and question things that someone without OCD would not. For example,

Participant 11 recognised that her difficulties using the kitchen were constrained by rigid rules which she had to follow, whereas this may not be an issue for someone without OCD:

> *A person without OCD would be like okay, this is what they recommend for food hygiene purposes, and this is what I can manage – they can take the advice within reason, but it just gets a bit blurred with my OCD (11)*

Participant 7 also felt that her perceptions of reality were skewed by OCD. Although she recognised that her thoughts may be irrational, she could not escape the doubts:

> *Realistically, I know it's a professional chef in a clean kitchen. Otherwise, the restaurant would be shut down, but in the little OCD corner of my brain, it just finds so many excuses to tell me that I'm in danger or that it's going to make me unwell, or it will make me anxious so that I feel nauseous and stop eating. (7)*

Similarly, Participant 9 described her dread of mealtimes as she was never sure what compulsion she would have to carry out to feel safer around food*: "Every mealtime you dread, because I can't say what my brain is going to start telling me and what I need to do."*

Whilst Participant 6 reported very few atypical eating behaviours herself, she offered insight into why those with OCD might have difficulties around food: *"If [those with OCD] struggle with eating, it's probably due to a compulsion or intrusive thoughts."*

Discussion

The current study aimed to better understand atypical eating behaviours in adults with OCD, using a qualitative design. A total of 11 females participated in semi-structured interviews, which explored their eating experiences and atypical eating behaviours. Reflexive thematic analysis generated three key themes relating to the study aim: (i) the hidden burden, (ii) the importance of control and (iii) the detrimental impact of OCD on eating.

A key finding of the study was that all participants described some degree of atypical eating due to OCD, anxiety or distress. Yet, for many of these individuals, their primary OC symptoms and their ability to maintain a healthy bodyweight and/or diet often masked their eating difficulties, despite having severe implications for their everyday functioning and psychological wellbeing. This reiterates the ICD-11's (2019) diagnostic classification of OCD which acknowledges that some individuals may maintain adequate daily functioning through significant additional effort.

Participants also reported engaging in emotional eating, which supports the findings of the study described in Chapter 3. Interestingly, it was evident that emotional overeating and undereating were not isolated behaviours, and that these were dependent on perceived levels of stress; this suggests that emotional eating occurs on a continuum. Furthermore, the present study highlighted a clear pattern of atypical eating which echoed the symptoms of OCD; for example, engaging in food avoidance and food preparation rituals to avoid becoming contaminated or unwell.

Widely recognised atypical eating behaviours, such as emotional eating or eating disorder symptoms, are assessed by validated measures such as the AEBQ (Hunot et al., 2016) or EAT-26 (Garner et al.,

1982). However, the findings of the current study pose the question of whether existing measures can sufficiently capture the nuances of atypical eating behaviours in OCD. For example, the EAT-26 identifies restrictive eating disorder symptoms related to anorexia nervosa and bulimia nervosa, but Participant 5 reported that her periods of restrictive eating were due to wanting control, rather than concerns over her weight. Therefore, it is possible that existing measures may not comprehensively identify atypical eating behaviours in OCD as they do not align with the typical profiles of recognised eating disorder pathologies. This may explain why some studies have observed eating disorder symptoms to not differ between OCD participants and controls (Bang et al., 2020; Boisseau et al., 2012).

Participants' views on OCD and their eating behaviours also raised important considerations regarding the distinction between OCD and eating disorders. Some participants, particularly those who reported eating disorder symptoms, strongly believed that their eating issues were directly related to their OCD. This poses the question of whether OCD and eating disorders are nosological conditions. For example, a diagnosis of anorexia nervosa requires one to have obsessions about weight gain, which then facilitates compulsive behaviours, such as restrictive eating or excessive exercise. On the other hand, OCD is broadly characterised by obsessions and/or compulsions unrelated to eating. Indeed, extremely low weight associated with anorexia nervosa distinguishes it from OCD, however it can be questioned whether the function and/or content of obsessions and compulsions (i.e., weight concerns vs. fears of contamination) warrant considering OCD and anorexia nervosa as separate disorders. This overlap suggests that some eating disorders might be a part of an obsessive-compulsive spectrum of disorders, alongside other disorders which are characterised by intrusive thoughts and/or compulsions (Hollander et al., 2005). Although this suggestion warrants further research and complex discussion, it is imperative to recognise that some individuals with OCD perceive their eating behaviours to be directly associated with their OC symptoms; such insights may inform more targeted interventions.

In the current study, many attempted to gain control over the impact of their obsessions or uncertainty in the environment by engaging in food-related rituals or compulsive eating behaviours. Previous research also suggests that control-related beliefs are a maintenance factor of OC symptoms (Moulding et al., 2009; Sandstrom et al., 2024). It has been proposed that seeking control serves to avoid the distress caused by obsessions, internal emotions and the uncertainty of one's environment. For example, Participant 2 would engage in compensatory behaviours to control her anxiety around becoming 'fat', and Participants 7 and 9 would carry out food preparation rituals to avoid the anxiety of becoming unwell.

Whilst gaining control appeared to be a catalyst of atypical eating, some participants acknowledged that they felt trapped within their rigid routines around eating, suggesting that their eating behaviours were ultimately controlling them. These findings echo existing research which proposes that, although individuals with OCD have a desire to control their thoughts, they have a lower sense of control over their thoughts (i.e., obsessions) or their ability to cope with particular situations, which then motivates the use of short-term strategies (i.e., compulsive behaviours) to regain control (Moulding & Kyrios, 2006). Subsequently, engagement in compulsive and/or ritualised eating behaviours may provide an illusory sense of control over obsessions; however, what began as a strategy for control might lead to losing autonomy over eating behaviours, indicating the presence of a vicious cycle. Evidently, control is a complex factor within OCD which warrants further investigation to understand how it affects eating behaviours in a larger sample.

Participants also spoke of how their ritualised eating behaviours and food preparation routines caused difficulties for those around them. In addition, OCD had negative effects on the participants when eating

outside of the home, which would often lead to engagement in safety behaviours. These findings extend previous research which highlights that OCD is associated with significantly impaired functioning in many areas of life, including the ability to uphold employment and maintain relationships (Black et al., 1998; Cicek et al., 2013; Patel et al., 2023; Stengler-Wenzke et al., 2007). Similar findings have also been observed by other studies, which have identified that having a mental health disorder or neurodevelopmental disorder is associated with impairments in functioning related to eating difficulties (Bamigbade et al., 2024; Kinnaird et al., 2019; Mueller-Stierlin, Peisser, et al., 2022).

Whilst many participants perceived their OCD and atypical eating behaviours to have a detrimental impact on day-to-day functioning, they felt their eating issues were not supported by healthcare professionals. Even in severe cases of atypical eating, where support was provided, participants felt that interventions were not tailored to support their eating difficulties that were complicated by OCD. For example, in accordance with NICE guidelines (2022), Participant 11 was provided educational resources for her diabetes diagnosis. However, her challenges with eating a healthy diet were not related to a lack of knowledge around eating well; instead, her difficulties stemmed from concerns over contamination and routines around food preparation which led her to consume convenient, processed meals. It would be important to consider the perspectives of those affected in order to improve intervention outcomes (Healey, 2025; Stanghellini et al., 2021).

This study provided important insight into the eating experiences of females with OCD, although the findings should be interpreted within the context of some limitations. For example, qualitative research often requires a homogenous participant sample; however, the participants displayed heterogeneous presentations of OCD, such as contamination concerns, obsessions and magical thinking. Given that earlier research has linked specific OC symptoms to atypical eating, it would be of interest to examine the eating experiences of those with specific types of OC symptomatology (Levinson, Zerwas, et al., 2019; Pollack & Forbush, 2013; Vanzhula et al., 2021). Moreover, OCD diagnoses were not confirmed using diagnostic tools, such as the Y-BOCS (Goodman et al., 1989). Additionally, there were no male participants, which limits the understanding of eating experiences in males with OCD. It is particularly important to address atypical eating in males with OCD as they have a greater risk of developing an eating disorder and are more likely to be overlooked for eating disorder support compared to females (Asaria, 2025; Cederlöf et al., 2015; Meier et al., 2015). Furthermore, whilst it was necessary to gain the subjective experiences of eating difficulties within OCD, this limits insight into eating challenges from a clinical perspective.

There are also important advantages to note. Whilst the sample size was small, it was the first study of its kind to provide unique insight into the eating experiences of females with OCD. The qualitative design allowed participants to describe their eating difficulties without using predetermined measures of atypical eating behaviours. Moreover, although the heterogeneity of the sample could be questioned, Reflexive Thematic Analysis focuses on exploring shared patterns that are relevant to the wider participant group. Many clinical implications also arose from the study, including insight into why eating behaviours may emerge in this group (e.g., in response to emotion, the need for control or as a reflection of OCD symptoms).

In summary, this was the first study to provide unique insight into the eating experiences of females with OCD and the complex interplay between OC symptoms and atypical eating behaviours. Whilst only a few of the participants had a history of eating disorders, many reported debilitating eating behaviours, such as food avoidance, ritualistic eating and loss of autonomy when eating or preparing foods. Participants also described how their eating behaviours were heavily intertwined with their OCD,

despite atypical eating behaviours not being recognised as a core symptom of the disorder. Such atypical eating behaviours were often overlooked in healthcare settings, highlighting a critical gap in clinical awareness and the need for more inclusive, targeted interventions. Future research should examine how OCD affects eating behaviours across more diverse populations and ensure that support reflects the complex challenges that may not fall within the boundaries of traditional diagnostic frameworks.

Chapter 8: Atypical eating in OCD – A clinical perspective

Overview

Thus far, this thesis has focused on the self-reported atypical eating behaviours of individuals with OCD or OC symptoms. However, it would be important to include the views of healthcare professionals as this could provide valuable insight into how atypical eating behaviours manifest in OCD within clinical settings. The following Chapter describes a mixed methods study, which explored atypical eating behaviours in the OCD population, from the perspectives of healthcare professionals. The study comprised two parts: Part I examined clinical perspectives of atypical eating behaviours in OCD using a brief quantitative survey and Part II explored this further using a qualitative approach.

Introduction

Existing research, including that of the thesis, indicates that atypical eating behaviours occur in the OCD population. Some of these eating behaviours are severe and may warrant an eating disorder diagnosis, whereas others fall below the threshold for diagnosis despite posing both psychological burden and physical health issues. Although research to date has been suggestive of atypical eating behaviours in OCD, the evidence base is dominated by subjective reports of atypical eating. It is important to obtain clinical or professional perspectives to further inform the presentation of eating in OCD, and consider how atypical eating can be addressed in this group.

Healthcare professionals (HCPs), encompassing a multidisciplinary workforce, support those with OCD in both community and inpatient settings. Professions supporting OCD include, but are not limited to, psychiatrists, mental health nurses and psychologists (Hobson, 2024; Yamamoto, 2014). It is particularly important to gain clinical insight and professional perspectives on atypical eating in OCD, as it can help inform the understanding and management of eating issues within this group, given that atypical eating is not recognised as a core symptom of OCD. In addition, combining both objective (HCPs) and subjective (those with a lived experience) views is one of the core principles underpinning patient centred care and shared decision making (Carey, 2016).

Considering both clinical perspectives and patient reported views on a topic area can provide a deeper insight into a given issue. This is also particularly important as HCPs and patients may have different perspectives. For example, a study which explored the perspectives of HCPs and recipients of support for healthy eating found that the HCPs and patients held different views regarding the determinants of atypical eating behaviours (Patricia et al., 2015). While HCPs noted that anxiety and self-esteem were key factors contributing to the development of atypical eating, patients expressed that self-perceived personality traits or past experiences may influence their eating patterns. These findings indicate that a more holistic overview, which includes the perspectives of those with a lived experience, as well as HCPs, may provide a more comprehensive understanding of why atypical eating occurs.

Further evidence suggesting differences in views between HCPs and those with a lived experience comes from a study which explored perceptions of bariatric surgery (Coulman et al., 2016). Whilst patients and HCPs both deemed surgery to be important for improving health outcomes, such as diabetes and mobility, some notable differences were observed. Patients were more likely to express concerns over excess skin and wanted to improve their quality of life and diet, compared to HCPs who considered

these factors as less important. In comparison, HCPs stressed the importance of complications following surgery and readmission. It was evident that, while HCPs were committed to ensuring safety during the procedure, patients expressed more concerns over quality of life post-surgery. Considering both HCP and patient perspectives could enhance the care provided.

Understanding HCPs' views on atypical eating in OCD can also provide insight into the management of these issues in clinical practice. In the qualitative study described in Chapter 7, some participants with OCD felt unsupported for their eating behaviours despite seeking help. The lack of empathetic and tailored support has also been expressed by others with a lived experience. For example, a personal account authored by Asaria (2025), who has both OCD and an eating disorder, highlights how he was unable to receive support for both conditions, despite expressing the enmeshment of his symptoms. Additionally, Healey (2025) described her lived experience of feeling a lack of compassion during eating disorder treatment, which perpetuated harmful effects on her wellbeing. She also reported being unable to receive support when her weight was not deemed pathological, even though she may have been more receptive to treatment at this time.

Some studies have illustrated that healthcare constraints and limited resources may underpin some of the difficulties faced by patients. For example, service-related factors, such as limited resources, increased demands on services, and time constraints in practice have posed difficulties for the treatment of eating disorders (Davey et al., 2014; Reid et al., 2010). Moreover, some patient-related factors may contribute to difficulties when treating eating disorders, including non-compliance with treatment, presentations complicated by comorbidities and treatment-resistance (Davey et al., 2014; Warren et al., 2008, 2012). Therefore, the clinical perspectives of HCPs may provide further insight into the presentation and management of atypical eating in OCD.

The perceived inadequate support for atypical eating in OCD may also be attributed to its limited recognition as a core OC symptom, as well as the lack of guidelines to address these difficulties in OCD. Whilst atypical eating appears to be widely prevalent in OCD, there are no formal NICE recommendations for its assessment or treatment. Consequently, only those with OCD who demonstrate severe eating behaviours (i.e., those warranting an eating disorder diagnosis) may receive support from an eating disorders service. This is of concern as it is recognised that OCD poses substantial risks for eating disorder development, and often precedes eating disorder onset (Bulik et al., 1996; Garcia et al., 2020; Kaye et al., 2004; Meier et al., 2015; Schaumberg et al., 2019; Swinbourne et al., 2012). Subsequently, there is a necessity for formal guidelines to identify or manage atypical eating in OCD; these guidelines may help to prevent the development of co-occurring disorders or physical health issues associated with atypical eating.

The lack of formal guidelines to assess and/or treat atypical eating in OCD may also underlie why some groups of individuals are less likely to receive support for their challenges with eating. For example, individuals with comorbidities, such as OCD and neurodevelopmental conditions, may be less likely to receive support for atypical eating behaviours, as such eating behaviours can be overshadowed by the comorbid condition. This was described by the participants in the previous qualitative study, as well as Asaria (2025). Additionally, Asaria (2025) noted that males and those with higher weights are also less likely to receive support as they do not fit the stereotypical presentation of those with an eating disorder, colloquially referred to as SWAG: 'skinny, white, affluent girls'. Together, these findings highlight how the absence of formal guidelines and reliance on 'typical' eating disorder presentations may contribute to disparities in recognition and support for atypical eating behaviours among adults with OCD.

Prior to developing formal guidelines to address atypical eating in OCD, it is necessary to understand how these behaviours present and are currently managed in clinical practice. Research exploring atypical eating and its management from the perspectives of HCPs could provide valuable clinical insight into these difficulties in OCD and suggest practical ways to address them in practice. However, to date, no research has examined the presentation and management of eating behaviours in OCD from the perspective of HCPs.

The current study proposed a mixed methods approach, which comprises two parts, to explore the clinical perspectives of atypical eating in OCD. In the first part, HCPs with at least one year's experience working with OCD participated in a brief quantitative survey exploring the presentation and management of atypical eating in OCD. The second part of the study included a semi-structured interview with a subset of the survey responders to further explore their views. Analysis for the qualitative component of the study adopted the use of Reflexive Thematic Analysis to identify shared patterns and meanings in the perspectives of the HCPs.

Method

Ethical approval

Ethical approval for the study was obtained from University of Hertfordshire Ethics Committee on 17th May 2024: Ethics protocol number: aLMS/PGR/UH/05427(4; Appendix 12). Approval to conduct the research within the NHS was received by the Health Research Authority and the Hertfordshire Partnership University NHS Foundation Trust (IRAS number: 331793). The study protocol involved participants completing a brief survey and/or a semi-structured interview about their experiences of atypical eating in OCD. The research was conducted in accordance with the Declaration of Helsinki.

Participants

Participants for Parts I and II were recruited from (i) the Hertfordshire Partnership Foundation NHS University Trust, which is a secondary mental health service providing support for individuals with mental illnesses, dementia and neurodevelopmental disorders, and (ii) the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS), a non-profit organisation. The study aimed to recruit a voluntary sample of at least 40 participants to complete the brief survey, and at least 6 HCPs to participate in the qualitative component of the study. Within the NHS, the study was advertised through local NHS communications (Appendix 29). Clinical teams which support those with OCD, such as the Highly Specialised Service for Obsessive-Compulsive Disorders and Talking Therapies services, were also invited to participate via email. Moreover, the study was advertised to members of the ICOCS via email. Clinicians, from any clinical background (e.g., care co-ordinators, psychiatrists, psychologists), with at least one year of experience working with the OCD population could participate in the study. There were no requirements pertaining to the country of practice for Part I, however participants for Part II had to have practiced in the United Kingdom to maintain homogeneity for the qualitative analysis. Those with insufficient English proficiency were excluded. All participants were provided with a Continuing Professional Development (CPD) certificate for their participation.

Materials and procedure

Part I

Part I of the study involved completing a brief survey. The survey consisted of 14 closed-ended and multiple-choice questions about atypical eating behaviours in OCD, each with an additional free-text field to provide further details or explain answers. The survey questions were developed by the lead researcher and supervisory team to capture the presentation of atypical eating in OCD, including both eating disorders and non-clinical atypical eating behaviours, and to understand how co-occurring eating disorders and OCD are managed in practice. Example questions included *'How frequently have you observed eating disturbances in adults with OCD?'* and '*Are there specific clinical resources for someone who presents with OCD and an eating disorder at your service?'*. The term 'eating disturbances' was used instead of atypical eating behaviours. A copy of the survey is presented in Appendix 51.

All aspects of Part I were completed using the online survey platform, Qualtrics. Participants were directed to the study using a link, where they were presented with the participant information sheet, which they had to read before completing the online consent form (Appendix 30-31). If participants wished to proceed with the study, they had to fill in the online consent form prior to gaining access to the survey. Completion of the survey took approximately 10 minutes. At the end of the survey, participants were asked to contact the lead researcher via email for their CPD certificate and to express their interest in Part II.

Part II

Potential participants were provided with a participant information sheet detailing all aspects of the study and were given the opportunity to ask the researcher any questions (Appendix 32). If they agreed to participate, a meeting was arranged to obtain formal consent and to complete the study interview. Participants had the option of completing the interview face-to-face, on the Trust premises, over telephone, or via video call using Microsoft Teams. If the consenting process and interview were carried out in person, participants signed a physical copy of the consent form. Meetings conducted remotely used a verbal consent form completed by the interviewer (Appendices 33-34).

Upon providing informed consent for the study, the participant was informed of their anonymous identifier and the interviewer collected basic demographic details, including the participant's profession and length of years worked with OCD patients. From this point, the participant was informed that the interview and audio-recording would begin and was asked to not disclose any identifiable information.

A semi-structured interview was then carried out using questions devised by the researcher and supervisory team (Table 8.1.). The interview schedule included a series of a series of open-ended questions relating to the participant's views of eating disturbances in OCD. Interviews ranged between 24 and 45 minutes long. Once the interview was complete, the researcher ended the audio-recording. All participants were provided with a CPD certificate, a copy of their consent form and a debrief sheet, detailing further information about the study and contact details for the researcher and supervisory team.

Table 8.1.
Semi-structured interview schedule for healthcare professionals

Semi-structured interview
1. Can you tell me about any eating disturbances that you have encountered within the OCD population during your clinical career? a. What types of eating disturbances have you observed? b. How common are eating disorders in the OCD population? c. How common are non-clinical atypical eating behaviours in the OCD population? d. Generally, when do eating disturbances emerge in this population (i.e., before/after/ at the same time as OCD symptoms)? e. How do eating disturbances/behaviours change throughout the course of illness? f. Can you describe any differences between eating disturbances in adults and children/adolescents with OCD?
2. Emerging evidence has highlighted that OCD might also be associated with avoidant-restrictive food avoidance. How familiar are you with ARFID? a. Can you tell me about any ARFID symptoms that you have come across in the OCD population? b. How common are ARFID symptoms in OCD?
3. What impact do eating disturbances have on OCD patients? a. What impact do eating disturbances have on weight? b. Can you describe the effect of eating disturbances on day-to-day functioning? c. What effect do eating disturbances have on a patient's ability to manage OCD symptoms?
4. If an OCD patient presented with eating disorder symptoms, how would this be addressed? a. Which service would be most appropriate to treat someone with comorbid OCD and eating disorder? i. Can you tell me about what would inform this decision? b. Would you consider OCD and eating disorder symptoms to overlap, or are they mutually exclusive/independent of one another? c. What would be the challenges associated with treating eating disturbances in this group? d. What resources are available for a person with OCD who also has eating concerns?
5. In your opinion why do you think eating disturbances occur in the OCD population? a. Can you explain whether you think specific OCD symptoms (e.g., contamination or ordering) are related eating disturbances? i. Which OCD symptoms are related to eating disturbances? b. Can you tell me about the factors which you think might underlie eating disturbances in this population? (e.g., sensory sensitivity, emotion regulation, personality traits, genetics etc.)
6. Is there anything else you would like to add that we have not covered?

Data analysis

Part I

Data for Part I of the study was not statistically analysed. Instead, descriptive statistics were used to present percentages characterising the presentation and management of atypical eating in OCD.

Part II

Audio-recorded interviews were transcribed by the interviewer and a research assistant based at the Hertfordshire Partnership University NHS Foundation Trust. The qualitative data was analysed using Reflexive Thematic Analysis (see Chapter 7 for a detailed description of this process). The lead researcher conducted the Reflexive Thematic Analysis and the findings were discussed with the principal supervisor before finalising the themes and subthemes.

Results

Part I

Sample details

In total, 43 HCPs completed the brief survey. Participant professions and clinical experience are summarised in Table 8.2.

Table 8.2.
Sample details

	Healthcare Professionals (*n*=43)	
	n	*%*
Profession		
Psychiatrist	21	48.8%
Psychologist	11	25.6%
Therapist	4	9.3%
Nurse	3	7.0%
Assistant psychologist	1	2.3%
Trainee clinical psychologist	1	2.3%
Dietician	1	2.3%
Chief Executive Officer	1	2.3%
Country of practice		
United Kingdom	29	67.4%
Brazil	2	4.7%
India	2	4.7%
Italy	2	4.7%
Portugal	2	4.7%
Argentina	1	2.3%
Ireland	1	2.3%
Lithuania	1	2.3%
Mexico	1	2.3%
South Africa	1	2.3%
United States of America	1	2.3%
Private or public health sector		
Public health service	29	67.4%
Private health sector	3	7.0%
Both public health and private health	10	23.3%
Academic setting	1	2.3%
Number of years working with OCD patients		

1-2 years	7	16.3%
3-5 years	7	16.3%
6-9 years	5	11.6%
10 years +	24	55.8%
Previous experience of working with eating disorders		
Yes	38	88.4%
No	5	11.6%
Diagnostic guidelines used		
The Diagnostic and Statistical Manual of Mental Disorders	24	55.8%
The International Classification of Diseases	16	37.2%
Not reported	3	7.0%

Presentation of eating disturbances in OCD

Participants were asked whether they routinely inquired about eating disturbances, including both eating disorders and non-clinical atypical eating behaviours, in their patients with OCD. Of the 43 HCPs, 21 (48.8%) responded 'yes', 16 (37.2%) responded 'sometimes', and six reported that they did not routinely ask about eating disturbances.

Participants most commonly reported observing eating disturbances in adults 'sometimes', while for children and adolescents, the most frequent responses were 'sometimes' and 'often'. These data are presented in Table 8.3.

Table 8.3.
Reports of how frequently eating disturbances were observed by healthcare professionals in OCD

How frequently are eating disturbances observed in patients with OCD?	Healthcare Professionals (*n*=43)	
	n	%
Adults		
Never	0	0%
Rarely	7	16.28%
Sometimes	18	41.86%
Often	8	18.60%
Frequently	4	9.30%
Most/all the time	0	0%
Not applicable or have not worked with adults	5	11.63%
Children and adolescents		
Never	1	2.33%
Rarely	1	2.33%
Sometimes	10	23.26%
Often	8	18.60%
Frequently	3	6.98%
Most/all the time	0	0
Not applicable or have not worked with children and adolescents	20	46.51%

A list of the eating disturbances observed in OCD patients by HCPs is presented in Table 8.4. The most observed eating disorders were anorexia nervosa and ARFID, and the most frequently observed non-clinical atypical eating behaviour was selective eating.

Table 8.4.
Eating disturbances observed in OCD

Atypical eating behaviours in OCD patients observed by healthcare professionals	Healthcare Professionals (*n*=43)	
	n	%
Eating disorders		
Anorexia nervosa	31	72.09%
Avoidant-restrictive food intake disorder	28	65.12%
Bulimia nervosa	12	27.91%
Binge-eating disorder	10	23.26%
Eating disorders not otherwise specified	17	39.53%
None	1	2.33%
Not sure	1	2.33%
Other		
Pica	2	4.65%
Non-clinical atypical eating behaviours		
Selective eating	40	93.02%
Food neophobia	20	46.51%
Dieting	19	44.19%
Bingeing	17	39.53%
Purging	10	23.26%
Compensatory exercise to manage/lose weight	19	44.19%
Focus on 'pure and healthy food' (orthorexia)	23	53.49%
Emotional overeating	13	30.23%
Emotional undereating	11	25.58%
Increased responsivity to food	3	6.98%
Slowness when eating	15	34.88%
Increased hunger	3	6.98%
Increased satiety responsivity	10	23.26%
Not sure	1	2.33%
Other	2	4.65%
OCD symptoms relating to eating (e.g., counting or contamination avoidance)	1	2.33%
Emetophobia	1	2.33%
Delaying eating	1	2.33%

HCPs reported that OCD symptoms related to contamination (*n* = 31, 72.09%), ordering, symmetry and counting (*n* = 23, 53.49%), somatic obsessions and compulsions (*n* = 22, 51.16%), and harm avoidance (*n* = 19, 44.19%) were the most associated with eating disturbances. Sexual (*n* = 5, 11.63%), religious (*n* = 6, 13.95%) and hoarding (*n* = 6, 13.95%) symptoms were the least associated. Six participants (13.95%) reported that no specific OCD symptoms were associated with eating disturbances. Some participants also provided alternative symptoms of OCD that they believed to be associated with eating disturbances in the free text responses: limitation of food and fluid due to fears of using the toilet (*n* = 1, 2.33%), anxiety (*n* = 1, 2.33%), emetophobia (*n* = 1, 2.33%), limited time to eat due to excessive time spent on rituals (*n* = 2, 4.65%), eating behaviours are idiosyncratic (*n* = 1, 2.33%).

Reports were mixed regarding the stability of eating behaviours over the course of OCD. Most HCPs indicated that eating behaviours were 'sometimes' stable (n = 25, 58.14%), nine (20.93%) reported they were 'often' stable, and eight (18.60%) reported they were rarely stable. Only one participant (2.33%) indicated that eating behaviours were stable 'most/all the time', and one participant (2.33%) was unsure. Free-text responses suggested that fluctuations in eating behaviours depended on the type of eating behaviour and whether it was directly related to OCD (see Appendix 53 for a full list).

Participants were also asked about the temporal relationship between OCD and eating disturbances. Most HCPs reported that OCD often preceded the eating disturbances (*n* = 23, 53.49%), while seven participants (16.28%) observed that eating disturbances preceded OCD symptoms. Only one (2.33%) participant suggested that OCD and eating disturbances occurred at the same time. Ten participants (23.26%) provided 'other' answers in the free text option, with seven (16.28%) noting that the temporal relationship between OCD and eating disturbances varies and depends on the individual's presentation.

Lastly, participants were asked to choose from a selection of options why they believe eating disturbances occur in OCD. A free text option was also available for participants to write causes which were not listed. This data is presented in Table 8.5.

Table 8.5.
Healthcare professional reports of why eating disturbances occur in OCD

Why eating disturbances occur in OCD	Healthcare Professionals (*n*=43)	
	n	*%*
Perfectionistic traits	32	74.42%
Difficulties in emotion regulation	27	62.79%
Rigidity/need for routine	30	69.76%
Sensory sensitivity	26	60.47%
Overlaps in OCD and eating disorder symptomatology	37	86.05%
Genetics	18	41.86%
Cultural influences	14	32.56%
Familial influence	21	48.84%
Prescribed medications	9	20.93
Free text suggestions		
Comorbidity with Autism Spectrum Disorder	1	2.33%
Obsessions/compulsions related to food	1	2.33%
Personal experiences of trauma	1	2.33%
Comorbidity with OCPD and/or body dysmorphic disorder	1	2.33%

Clinical management of co-occurring OCD and eating disorders

In the final part of the survey, HCPs were asked about the management of co-occurring OCD and eating disorders. There was no consensus on the optimal approach. The most common responses were to continue OCD treatment and monitor eating disorder symptoms (*n* = 12, 27.91%) and to continue with OCD treatment whilst also referring to an eating disorder specialist (*n* = 9, 20.93%). Several participants also provided 'other' answers, including treating the most severe symptoms first or addressing both

OCD and eating disorder symptoms simultaneously. All answers to this question are provided in Appendix 53.

Similarly, there were mixed responses when participants were asked which service was most appropriate for co-occurring OCD and eating disorders. Fourteen participants (32.56%) suggested an OCD service, nine participants (20.93%) suggested an eating disorder service and 20 participants (46.51%) reported 'other'. The most common 'other' responses emphasised considering the primary presenting issue, severity of symptoms and collaborative work between OCD and eating disorder services. Several participants suggested that anorexia nervosa or low weight should be addressed first because of the associated physical health risks.

Most participants reported that there were no clinical resources for patients with co-occurring OCD and eating disorders (n = 28, 65%), while eight were unsure (18.60%). Seven participants reported that clinical resources were available, including access to a dietician, collaborative care between OCD and eating disorder services, occupational or psychological therapy, and clinicians with a specialist interest in ARFID.

Many HCPs agreed that other comorbidities should be assessed when a patient presents with co-occurring OCD and an eating disorder (n = 35, 81.40%). The most common comorbidities to be explored included: autism spectrum disorder, personality disorders, mood and anxiety disorders and obsessive-compulsive and related disorders. A full list of reported disorders is provided in Appendix 53.

Part II

Sample details

Seven HCPs participated in the qualitative component of the study. The HCPs were from varied professional backgrounds and clinical settings (i.e., inpatient services and community settings). On average, participants had approximately 22 years of experience working with OCD service users. All the participants worked for public health services, with two also practicing in the private health sector. Details of the HCPs are provided in Table 8.6.

Table 8.6.
Details of healthcare professionals participating in Part II

Participant	Profession	Current area of clinical practice	Years of experience with OCD service users
1	Consultant psychiatrist	Adult community mental health team	13 years
2	Psychotherapist	Specialised service for OCD	30+ years
3	Consultant psychiatrist	Acute inpatient ward (female)	16 years
4	Consultant psychiatrist and academic	Not currently practicing	40+ years
5	Consultant psychiatrist	Community eating disorders service	15 years
6	Consultant psychologist	Child and adolescent mental health services	19 years
7	Consultant psychiatrist	Specialised service for OCD	20 years

Themes and subthemes

Three themes were generated during the reflexive thematic analysis. The first theme referred to the presentation of eating disturbances in OCD, while drawing attention to underlying factors and how those with OCD are both similar and different to individuals with an eating disorder. The second theme focused on the global impact of eating difficulties on those with OCD, and the final theme highlighted considerations for treating eating disturbances in OCD. A list of the themes and subthemes can be found in Table 8.7.

Table 8.7.
Themes and subthemes generated from interviews of healthcare professionals

Themes and subthemes
The presentation of eating disturbances in OCD
1. *Eating disturbances observed in OCD*
2. *Determinants of eating disturbances in OCD*
3. *Similarities and differences between OCD and eating disorders*
Challenges posed by disturbances in OCD
4. *The negative impact on daily functioning*
5. *Difficulties developing and maintaining relationships*
6. *Physical health complications*
Considerations for treatment
7. *The importance of achieving a healthy weight*
8. *Identifying the nature of eating disturbances*
9. *The need for collaborative working in practice*

Theme 1: The presentation of eating disturbances in OCD

Subtheme 1: Eating disturbances observed in OCD

In general, the presence of eating disturbances was perceived to be common in adults with OCD:

> *Generally [eating disturbances] are common (Participant 2)*

Participant 6, who worked in child and adolescent mental health services, similarly noted that a large proportion of their service users also had issues with eating: *"I would say probably 50-75 percent of them aren't eating properly"*.

Regarding the type of eating behaviours displayed, participants reported having observed a wide range of eating disturbances in those with OCD. This included food avoidance, dieting related behaviours and overeating. For some patients, eating behaviours would also fluctuate in line with OC symptoms:

> *I think the whole range…the most common is this feast or famine. OCD often waxes and wanes, so they eat excessively when they're feeling relatively well, because they know that the time of famine is coming (Participant 4)*

Although various eating disturbances were observed, the most common were related to food avoidance, often manifesting as restrictive or selective eating:

> *People [with OCD] are more selective with the food they eat in general…they definitely choose healthier foods or try to control food (Participant 1)*

While eating behaviours and cognitions related to anorexia nervosa and bulimia nervosa, such as dieting or concerns over bodyweight, were observed, they were typically less common in children and adults with OCD:

> *I would say [body image issues or concerns are] less common in the OCD or autistic population (Participant 6)*

Subtheme 2: Determinants of eating disturbances in OCD

The participants observed that several factors often underpinned eating disturbances in children and adults with OCD. These included specific OC symptoms, characteristics of the OCD population and co-occurring disorders. With regards to specific OC symptoms, fears of contamination were consistently associated with eating disturbances:

> *I've had people who had restricted their eating so much because of their contamination fears that they ended up on nasal gastric feeding. There was no body image issue, it was just their concern about food contamination (Participant 7)*

However, Participant 2 also noted that those with OCD who experience taboo thoughts may be less inclined to seek help for their symptoms. Therefore, it may be difficult to ascertain the relationships between some specific OC symptoms and eating disturbances: *"If someone has got paedophilic thoughts as a form of OCD…they tend to not willingly voice that or seek help because of the consequences and fears they might have about it, but they are more than happy to talk about the eating disorder".*

Another pattern observed by the HCPs was that personality traits or characteristics of the OCD population were linked to eating disturbances. For example, harm avoidance, a common phenomenon among those with OCD, appeared to be related to food avoidance:

> *It's sort of a fear of vomiting because there's this sense of "oh, but my stomach's churned up, I can't possibly eat" (Participant 6)*

Similarly, some participants described that those with OCD often fluctuate between complete engagement and disengagement. This pattern can lead to cycles of highly restrictive eating followed by overeating, suggesting that it can be difficult to have a balanced approach to eating:

> *I think there's the all or nothing phenomena of OCD. People with OCD tend to go one way or the other. They don't really go into the grey. They're always in the black or white area. So that's one personality trait that many people with OCD have (Participant 4)*

Another characteristic reported was the tendency for those with OCD to be compulsive and/or impulsive:

If we look at OCD as an obsessive-compulsive spectrum, you've got compulsivity and impulsivity. It could be they're on the more impulsive side of eating, and other people might control everything (Participant 7)

Some HCPs also thought that the personality trait of perfectionism, commonly observed in OCPD, could motivate those with OCD to engage in restrictive eating patterns:

If someone is perfectionistic and wants to slim or to be fit, they will follow a rather rigid restrictive eating pattern… you might find that they will count the calories to be absolutely perfect. It's not driven by their views of their weight (Participant 2)

Lastly, all participants highlighted that OCD often occurs with other mental health or neurodevelopmental disorders, which are also associated with eating disturbances. Consequently, these co-occurring disorders may underlie the expression of atypical eating in OCD. The most frequently reported co-occurring disorders were autism spectrum disorder, OCPD and body dysmorphic disorder:

There are also OCD related disorders, such as body dysmorphia…which, in this case, has a body image element to it and may also present with eating difficulties (Participant 1)

[Restrictive or selective eating] can be linked to the contamination fears…but there's also ARFID. ARFID is often comorbid with autism spectrum disorder. There's also OCPD traits, where you have that need for control, which can lead to restrictive eating (Participant 7)

Subtheme 3: Similarities and differences between OCD and eating disorders

All participants reported similarities between OCD and more severe types of eating disturbances (i.e., eating disorders). A commonly reported similarity was the thought processes of those with OCD and eating disorders. This included obsessing, rigidity and the need for control:

I think eating difficulties kind of lends itself to OCD because of the thinking patterns, the rigidity and control. They're quite enmeshed (Participant 3)

By the nature of the eating disorder, the obsessiveness is what makes it an eating disorder. You have the obsessionality and the compulsion to achieve what you want to achieve (Participant 5)

However, there were also key factors which differentiated OCD from eating disorders. For example, those with an eating disorder were more likely to perceive their body image in a negative way:

I think they overlap in many ways in the spectrum, but I believe one of the biggest differences is the body image disturbances, which I believe are quite typical, quite peculiar, of a true pure clinically relevant eating disorder (Participant 1)

What kind of cognitions are there? If it's 'I'm fat, I can't bear to look at myself, I can't gain weight', that is clearly this a type of anorexic cognition (Participant 3)

Participant 4 also highlighted that those with anorexia nervosa are often able maintain weight within precise parameters, avoiding the typical weight fluctuations that occur, which sets them apart from those with OCD: *"[Those with anorexia nervosa] can keep it to the point-something of a kilo"*.

Theme 2: Challenges posed by eating disturbances in OCD

Subtheme 1: Negative impact on daily functioning

Eating disturbances were reported to have a negative impact on the day-to-day lives of those with OCD. This included not having an adequate diet or sufficient nutrients to function:

> *If you're not eating and you're not fuelled, then it's very hard for you to cope with day-to-day concerns…in the same way that not sleeping would add to difficulties (Participant 6)*

HCPs highlighted that excessive rituals around eating consumed a large proportion of one's day, which limited their ability to engage in other fundamental activities:

> *He took ages to eat, purely for the fact that he had to rearrange the cupboards in a certain way. He would take hours to eat a meal and to follow the rituals (Participant 5)*

> *They eat so slowly; it might take 3-4 hours. It can get to a point where they cannot get to work on time (Participant 2)*

Eating outside of the home was also reported to be a challenge for some with OCD. This could lead to isolation and greater rigidity around eating:

> *Sometimes it's eating out or not eating at their home which could be a problem (Participant 7)*

Subtheme 2: Difficulties developing and maintaining relationships

Participants noted that eating disturbances in OCD affected relationships with family and peers. For example, Participant 5 described an adult with OCD whose rituals around eating prevented them from eating with others, which caused isolation and difficulties for those living with them: *"When he was eating, he would send everybody out of the kitchen"*.

Similarly, Participant 6 described the burden of eating disturbances on parents of children with OCD, and how family mealtimes could be negatively affected: *"Cooking three different meals is a lot of work for the parent and they may not sit down together to have a family meal, so they obviously lose out on lots of things"*.

In cases where eating disturbances require hospitalisation, there could be a detrimental impact on one's ability to develop and maintain social relationships. This is particularly challenging for children who are hospitalised as it can inhibit their social development:

> *Some children end up being admitted in hospital and then that affects their social interaction with others at school (Participant 2)*

Participant 3 also highlighted how severe OCD can be difficult for carers and/or relatives to manage. Consequently, some patients may lose their support networks and neglect their diet and self-care:

> *Quite often they are left to their own devices because they're so impossible to live with. Everyone moves away because they can't manage them…by the time they're brought to hospital, they are in a very significant condition (Participant 3)*

Subtheme 3: Physical health complications

Participants explained that those with OCD are more susceptible to health difficulties compared to the general population. The addition of eating disturbances can contribute to poorer health in OCD and, in some cases, increase the risk of life-threatening health conditions within an already vulnerable group:

> *They are more likely to have heart attacks, strokes...it's a very serious condition. I want my [patients] to be healthy (Participant 4)*

> *Physical health is obviously impacted when overeating, in terms of weight, diabetes and metabolic problems. With dietary restrictions, there's lack of nourishment, bowel problems, and loss of periods in women…so it's a wide range of physical problems (Participant 1)*

Participant 3, a consultant psychiatrist in an inpatient unit, also described how restrictive food and fluid intake can pose serious complications, which can lead to mortality: *"If you develop acute kidney injury and kidney failure, you can die. You can last a bit longer without eating - eating not is immediately crucial - but people end up really physically unwell".*

Moreover, Participant 7 described a vicious cycle of health complications, which can in turn lead to continued restrictive eating. For example, some patients may reduce their food intake to avoid being exposed to contamination in toilets. Hence, monitoring of these patients is fundamental to prevent serious health complications:

> *They end up being quite constipated because of the restricted eating or selective eating. Some might actually like the constipation because they don't have to wash their hands after they've been to the toilet. They end up going to the toilet once a week, which is dangerous (Participant 7)*

Theme 3: Considerations for treatment

Subtheme 1: The importance of achieving a healthy weight

Participants emphasised that, although it is important to treat OC symptoms and eating disturbances, achieving a healthy weight is paramount to avoid physical health complications, or even mortality, and improve response to psychological therapies:

> *I'm very worried about people with very low weight because OCD kills slowly, anorexia kills quickly (Participant 4)*

All participants acknowledged that low weight could contribute towards increased rigidity, obsessions and compulsions. Hence, it is important to ensure a patient's weight is sufficient to achieve optimal treatment outcomes:

> *In the presence of OCD, it's very likely that if you are underweight, it's not going to help, and it can make obsessive-compulsive behaviours worse (Participant 1)*

> *Because when [their] brain is starved, [they] only have one protocol to function. [They] have no resources or cognitive abilities to deviate from [their] plan (Participant 3)*

However, there can be a vicious cycle when attempting to treat OCD symptoms and eating disturbances. For some, psychological therapies are needed to achieve a healthy weight, but it can be difficult for patients to engage in psychological therapies when low weight contributes towards increased cognitive rigidity:

> *You can't get them to eat more without the therapy, but their therapy doesn't work because they're not eating enough. That is where it can go around in a cycle (Participant 6)*

For some, psychological therapies, such as CBT, can also lead to weight loss:

> *CBT is quite stressful and often we see a weight loss… so we may need to suspend treatment (Participant 7)*

To ensure that health and weight are maintained, HCPs may need to temporarily accommodate food-related obsessions within interventions, such as those driven by contamination fears or preparation rituals:

> *You can speak to a dietician so that we have food that takes less time to prepare or food that comes sealed…you do it as a temporary measure. It's important that [they] have adequate food, and that [their] health is maintained (Participant 2)*

Subtheme 2: Identifying the nature of eating disturbances

All participants agreed that the most effective way to manage and treat eating disturbances in OCD was to understand the nature of the presenting eating issues:

> *You have to understand what's driving [the eating behaviours]. Is it a symptom of something else? If so, what is it? Or is it a disorder in its own right? (Participant 2)*

> *I'm more interested in their reasons for avoiding [food] (Participant 6)*

However, some reported challenges in identifying why eating disturbances occur when a patient presents with co-occurring disorders. For example, restrictive eating may occur in both OCD and autism spectrum disorder. Subsequently, the HCPs would need to disentangle whether the OCD, autism spectrum disorder, or both are contributing to the food restrictions:

So, if you have autism [and OCD], you might have a very restricted diet. You have to spend a bit of kind of time actually teasing that out (Participant 3)

Participant 6 also highlighted that it was important to consider that some eating behaviours may be more resistive to change due to a co-occurring disorder. Acknowledging the nuances of eating disturbances in co-occurring disorders may help to establish more achievable goals for treatment:

Also separating out what's the OCD and what's the autism. I might never get them to eat certain foods, but can I get them to eat enough of the foods that they would eat (Participant 6)

Ultimately, treatment attempts for eating disturbances in OCD can be successful if the aetiology of the eating issues are accurately identified:

There are people with emetophobia, which is separate from OCD, but I see it as similar…they have emetophobia, and as a result of that, they restrict [their food]. If you treat the emetophobia, it can get better (Participant 7)

Subtheme 3: The need for collaborative working in practice

All HCPs recognised that collaborative working between OCD and eating disorder specialists was the most appropriate way to manage severe eating disturbances (i.e., eating disorders) in OCD:

You might want to engage a dietitian, even though you need to do exposure work (Participant 2)

However, many of the participants reported that collaborative working wasn't always adopted in practice:

We're culprits of saying we can't treat the OCD if the eating disorders aren't under control, and the eating disorder consultants say they can't treat the eating disorder because the eating disorder is due to OCD. I think we should work together as teams because they are often very, very interlinked (Participant 7)

Several participants also described that acceptance into specialised mental health services was restricted by rigid criteria, such as low weight, body image distortions or disorders independent of comorbidities. Subsequently, those with co-occurring difficulties, such as OCD and an eating disorder, may fall under generic mental health services that are not always equipped to manage the presenting concerns:

Unless it's very pure anorexia or bulimia, they tend to come under the generic child and adolescent mental health services (Participant 6)

Consequently, some patients may also be refused assessment or treatment, which could lead to worse outcomes or relapse:

He needed to be admitted because of OCD. Of course, the fact that he had a history of anorexia, the adult community mental health service didn't want to know. They pushed and pushed until he lost weight, and now he is in an eating disorder unit (Participant 5)

Some participants suggested that barriers to treating eating disorders in OCD, such as limited knowledge or treatment resources (e.g., health monitoring), could also be minimised by working collaboratively with specialist eating disorder teams:

> *I think maybe the barriers are resources, knowledge and not feeling too confident to treat something that you are not familiar with (Participant 7)*

Discussion

The current study aimed to explore HCPs' perspectives of atypical eating in OCD using a survey and semi-structured interviews. Findings from Part I illustrated that HCPs perceived atypical eating behaviours, varying in type, to be relatively common amongst those with OCD. Moreover, the qualitative component of the study further expanded these findings by providing further insight into the presentation and management of atypical eating in OCD. Three key themes were constructed: (i) the presentation of eating disturbances in OCD, (ii) challenges posed by eating disturbances in OCD and (iii) considerations for treatment.

As expected and in line with findings of the thesis, HCPs reported observing a wide range of eating concerns in those with OCD, ranging from food restriction to overeating (Ay & Aytas, 2018; Bang et al., 2020; Peters et al., 2019; Rai et al., 2022). However, it appeared that those with OCD generally displayed restrictive eating patterns; HCPs noted that non-clinical selective eating, as well as restrictive eating disorders (i.e., anorexia nervosa and ARFID) were most frequently observed in this population. These findings align existing literature which suggests that more restrictive patterns of eating, such as those observed in anorexia nervosa, may be more frequently associated with OCD (Levinson et al., 2019; Serpell et al., 2002; Simpson et al., 2013). However, cognitions surrounding weight and shape concerns were less typical of those with OCD, and were instead suggested to be linked to co-occurring depression and poorer emotion regulation, rather than OC symptoms themselves.

Whilst food approach behaviours (i.e., overeating or bingeing) were observed in OCD, these were less common and appeared to fluctuate in line with the severity of OC symptoms. For example, Participant 4 described observing restrictive eating patterns during periods of severe OC symptoms, followed by phases of overeating after symptoms had subsided, indicating a bi-directional relationship. These findings may reflect the state dependent nature of eating behaviours in OCD, whereby symptoms, such as those relating to anorexia nervosa, have been noted to decline simultaneously with OC symptoms (Lewis et al., 2019; Roberts et al., 2011; Simpson et al., 2013). However, although OC symptoms and restrictive eating may become more manageable, there remains the risk that eating behaviours could shift towards overeating, with potential consequences including cardiovascular and metabolic diseases, as well as obesity (Buzanello-Donin et al., 2025; Dziewa et al., 2023).

Similar to the participants in Chapter 7, HCPs deemed some atypical eating behaviours to stem from specific OCD symptoms, such as contamination concerns, or characteristics of the OCD population, including perfectionism, control and harm avoidance. HCPs in the current study also highlighted the role of co-occurring disorders, such as autism spectrum disorder and OCPD, which are also linked to eating concerns and may underlie atypical eating patterns in individuals with OCD (Degortes et al., 2014; Marí-Bauset et al., 2014; Nisticò et al., 2024; Serpell et al., 2002). Additionally, HCPs discussed

the roles of compulsivity and impulsivity in driving different types of eating behaviours: individuals with more impulsive tendencies may overeat, whereas those with stronger compulsive traits may restrict their intake. Impulsivity and compulsivity are important in the conceptualisation of the obsessive-compulsive spectrum disorders, which is an overarching term for disorders characterised by obsessive-compulsive traits, such as OCD and eating disorders (Hollander et al. 2005).

All participants agreed that identifying the underlying cause of eating issues is critical for effective treatment. However, this can be challenging due to the overlap between OCD and co-occurring disorders, such as OCPD or autism spectrum disorder. For example, rigidity and sensory sensitivities, which often underlie selective eating in autism spectrum disorder, may also be present in individuals with OCD (Smith et al., 2020; Zickgraf et al., 2022; Zickgraf & Elkins, 2018).

The presence of co-occurring disorders may also affect the temporal relationship of eating behaviours in OCD. Previous research suggests that OCD often precedes eating disorders, indicating a potential temporal relationship (Buckner et al., 2010; Hofer et al., 2018; Micali et al., 2011). However, the findings of the current study proposes that this relationship may vary between individuals. In cases where OC symptoms directly influence eating behaviours (e.g., contamination concerns leading to food avoidance), it would be plausible to suggest that the onset of OCD occurs prior to atypical eating. However, when co-occurring disorders such as autism spectrum disorder or OCPD are present, the temporal relationship may be more uncertain due to the enmeshment of these disorders with OCD.

HCPs also highlighted the importance of addressing weight status in individuals who are severely underweight, as this can increase health risks and contribute to increased rigidity, which can negatively affect response to treatment. As described by Participant 2, HCPs may need to accommodate food obsessions within treatment to ensure health is maintained. These strategies underscore the principles of exposure and response prevention therapy where those with OCD are gradually exposed to anxiety provoking situations, which in this case may also involve foods (Hezel & Simpson, 2019). However, whilst pathological weight status may signal the need for more immediate attention, it is important to acknowledge the growing body of evidence which suggests weight is not necessarily indicative of eating disorder severity (Harrop et al., 2023; Machado et al., 2017).

All HCPs recognised the importance of addressing eating disturbances in OCD, but many reported barriers to implementation. Frequently reported barriers included challenges in collaborative working between services, limited resources such as health monitoring, and rigid criteria for admission into eating disorder services. These findings are in line with existing research which reported similar barriers to treatment in eating disorders services, highlighting broader systemic issues across healthcare services (Davey et al., 2014; Reid et al., 2010). As a result, individuals presenting with both OCD and an eating disorder may not receive appropriate interventions and support, which raises significant clinical concerns.

Moreover, whilst all HCPs demonstrated a strong understanding of atypical eating in OCD, those not specialising in eating disorders felt less confident in managing severe eating issues in OCD. Limitations in clinical knowledge are also seen as a barrier to the treatment of eating disorders more generally, which highlights the importance of providing HCPs with specialised training and provisions to identify and/or manage atypical eating (Asaria, 2025). A similar proposal was also made by Burrows and colleagues (2020), where HCPs felt that it was important to undergo additional training to better support their patients with eating difficulties. Collaborative working between OCD and eating disorder services

may also help address knowledge gaps; however, most participants reported practical barriers to implementing such collaboration.

A strength of the study was the use of a mixed methods approach to provide further understanding into the presentation and management of atypical eating behaviours in OCD. Moreover, this was the first study of its kind to include the perspectives of HCPs in research exploring atypical eating in OCD, adding a degree of objectivity to the current literature base. However, there are also some limitations to note, such as the small sample size in Part I. Additionally, although the study was open to all HCPs, the majority of participants were psychiatrists with a medical degree, which may not be representative of all professionals supporting individuals with OCD. Furthermore, most participants had experience treating adults rather than children; future research should include clinicians working with children, as atypical eating behaviours may differ across developmental stages.

In summary, this mixed methods study highlighted that atypical eating behaviours are frequently observed in individuals with OCD and can significantly impact daily functioning and overall quality of life. While some atypical eating behaviours may be attributed to OC symptoms, such as contamination fears, it was also acknowledged that co-occurring disorders, such as autism spectrum disorder and OCPD, may also contribute to their presentation. Important clinical implications were also raised, including barriers to collaborative working, which can have a negative impact on the treatment of more severe atypical eating behaviours in OCD. It may be important for HCPs to receive training to enhance their understanding and ability to manage atypical eating in OCD. Future research should explore strategies to overcome barriers to treatment in clinical practice.

Section II Summary

The mixed methods studies presented in Section II explored atypical eating in adults with OCD, from the perspectives of those with a lived experience, as well as HCPs. As reported by participants with OCD and HCPs, those with OCD experience a wide range of atypical eating behaviours, some of which are less severe (non-clinical atypical eating behaviours), while others reflect eating disorder symptomatology. Importantly, those with OCD reported more severe atypical eating behaviours and were more likely to be at risk of an eating disorder compared to healthy controls. Both non-clinical atypical eating behaviours and eating disorder symptoms were reported to have a debilitating effect on individuals with OCD, encompassing challenges with day-to-day life and relationships.

The determinants of atypical eating in those with OCD included sensory sensitivity, seeking control, co-occurring disorders (e.g., autism spectrum disorder) and characteristics of OCD (e.g., perfectionism or harm avoidance). Moreover, several barriers to managing and treating atypical eating in OCD were reported by both participants with OCD and HCPs. These findings are discussed further, and in relation to Section I (Chapters 3–5), in the following discussion chapter.

Chapter 9: General discussion

Overview of the thesis

OCD and its symptoms have been consistently linked to eating disorder symptomatology in both general and clinical populations (Bang et al., 2020; Barnhart et al., 2021; Peters et al., 2019; Zickgraf et al., 2016). Notably, individuals with OCD are at greater risk of an eating disorder compared to the general population, and vice versa. However, existing research examining this relationship has centred on the presence of OCD symptomatology among those diagnosed with eating disorders. Furthermore, most research has overlooked the broader spectrum of atypical eating in the context of OCD, such as extreme food avoidance (i.e., ARFID) and non-clinical atypical eating behaviours (e.g., selective eating).

Given the complex psychological and physical health issues that can ensue from pathological eating patterns, there was a clear need to examine the broader range of atypical eating behaviours in OCD and those showing OC symptoms, as well as any underlying factors contributing to their presence. The findings of the scoping review highlighted that individuals with OCD and those in the general population with elevated OC symptomatology were more likely to engage in atypical eating behaviours. These eating behaviours included those related to eating disorders, food avoidance, and orthorexia nervosa; this provided the framework to further develop the studies in the thesis. Moreover, the empirical studies observed that OC symptoms were associated with a wide range of atypical eating behaviours in those with OCD, as well as controls. Importantly, OC symptoms were not the sole determinant of atypical eating behaviours in these groups. The studies also highlighted the detrimental impact of atypical eating for those with OCD, and the barriers to accessing treatment for such difficulties in clinical settings.

OC symptoms and atypical eating in the general population

Echoing the sparse literature base, Chapters 3 and 4 observed that adults in the general population who display elevated levels of OC symptomatology were more likely to engage in atypical eating behaviours. The atypical eating behaviours present among these individuals were not limited to eating disorder symptoms, such as anorexia nervosa and bulimia nervosa, but also included symptoms of ARFID and non-clinical eating behaviours related to selective eating and food approach. This highlights that OC symptomatology is linked to a wider range of atypical eating behaviours than previously recognised, rather than being restricted to symptoms related to weight and shape concerns (i.e., anorexia nervosa and bulimia nervosa symptoms), which have dominated the existing literature base (Barnhart et al., 2021; Carrot et al., 2017; Swinbourne et al., 2012).

Of note, it appeared that a subset of individuals with elevated OC symptoms were more likely to engage in eating disorder symptoms. Chapter 4 indicated that individuals in the general population presenting with OC symptoms concerning contamination and hoarding were more likely to have elevated levels of ARFID and anorexia or bulimia nervosa, respectively. These findings provide evidence to suggest that food avoidance or ARFID symptoms may be a phenotypic manifestation of OC contamination symptoms. Although the relationship between hoarding and anorexia nervosa and bulimia nervosa was less clear, earlier research also identified that hoarding symptoms frequently present among those engaging in bingeing behaviours (Nicoli de Mattos et al., 2018; Raines et al., 2015). Alternatively,

hoarding in anorexia and bulimia nervosa may refer to food-related obsessions that lead to the hoarding of certain foods, or concerns with relinquishing control over eating (Baldini et al., 2022). These findings are similar to that of existing research which has indicated an association between specific OC symptoms and atypical eating behaviours, and may help to identify individuals at risk of these pathological eating patterns (Levinson et al., 2019; Vanzhula et al., 2021).

Moreover, whilst it was not the aim of the thesis to characterise prevalence rates of OCD in the general population, the studies presented in Section I, as well as another independent study not included in the thesis, consistently reported OCD prevalence rates of approximately 20%, which is markedly higher than the 1-5% observed in existing research (Adam et al., 2012; CilliÇilli et al., 2004; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Ruscio et al., 2010). These findings underscore that a larger proportion of the general population may reach the clinical threshold for OCD and consequently experience concurrent challenges, such as atypical eating.

Overall, the findings from the general population studies suggest that the relationship between atypical eating and OC symptoms is not limited to those with clinical levels of OC symptomatology but extends to the wider general population where subclinical symptoms exist. Given that both atypical eating behaviours and OC symptoms have the potential to worsen over time, earlier identification of these symptoms is paramount to preventing the development of clinically significant symptomatology (Black & Gaffney, 2008; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Herle et al., 2020).

Atypical eating in the OCD population

A core aim of the thesis was to clarify the presentation of atypical eating behaviours in individuals with OCD. Chapters 6–8 presented three empirical studies of different methodologies to address this aim. Despite differences in methodology (i.e., quantitative and qualitative) and participant groups (i.e., individuals with OCD and HCPs), the findings consistently indicated that many of those with OCD experience a wide range of atypical eating behaviours. Food-avoidant behaviours, particularly selective eating and ARFID symptoms, were frequently observed in this group. Whilst eating disorder symptoms relating to anorexia nervosa and bulimia nervosa were present, HCPs reported them to be less common and more reflective of individuals with mood disorders or an underlying eating disorder.

In Chapters 7 and 8, it was found that different pathological eating patterns were not mutually exclusive. For example, selective eating could be followed by episodes of bingeing, and vice versa, indicating a degree of fluctuation in atypical eating behaviours. In addition, and similarly to the general population studies, Chapters 7 and 8 suggested that individuals with OCD characterised by contamination fears were more likely to be avoidant of food and to exhibit meticulous concern over food choices and meal preparation. Again, this suggests that food avoidance may represent a phenotypic expression of OCD, particularly in relation to contamination concerns.

Atypical eating behaviours also appeared to vary in severity between individuals, with some experiencing particularly challenging eating disorder symptoms and others engaging in non-clinical atypical eating behaviours. For those experiencing severe eating disorder symptoms, which may have warranted an eating disorder diagnosis, day-to-day functioning was significantly impaired and caused marked distress. Non-clinical atypical eating behaviours also appeared to affect daily functioning, including meal preparation and eating rituals; however, this was perceived to be less severe than eating disorder symptoms. These findings provide further evidence that OCD has a negative, global effect on

daily functioning, which extends to eating behaviours and meal preparation (Patel et al., 2023; Vorstenbosch et al., 2012).

Perhaps one of the most prominent findings was that individuals with OCD were also at greater risk of a probable ARFID diagnosis. Few studies have identified OCD and/or OC symptoms in individuals with ARFID; however, Chapter 6 presented the first study of its kind to specifically assess the prevalence of probable ARFID in a group of participants with OCD (Nitsch et al., 2023; Thomas et al., 2021; Zickgraf et al., 2016). These findings highlight the need to consider alternative eating disorders among the OCD population beyond those characterised by weight and shape concerns.

Mechanisms of atypical eating

Although OC symptoms have been linked to atypical eating, it is important to acknowledge that not all individuals with OCD or elevated symptoms engage in pathological eating behaviours. Hence, the second core aim of the thesis was to identify the subset of individuals who may experience marked eating challenges. To shape these studies, the programme of research adopted a mixed methods approach, utilising participants from the general population, the OCD population and HCPs.

An initial set of quantitative studies examined potential risk factors for atypical eating in the general and OCD populations. The findings indicated a complex relationship between OC symptoms, atypical eating behaviours and these risk factors, with different patterns emerging depending on the study population. In the general population study presented in Chapter 5, it appeared that whilst OC symptoms could predict atypical eating behaviours, the relationship was underpinned by other factors, such as those described by the Transdiagnostic Model of Eating Disorders (Fairburn et al., 2003). Those demonstrating high levels of OC symptoms, perfectionistic traits and poorer emotion regulation were more likely to display anorexia nervosa and bulimia nervosa symptoms. In contrast, those with high levels of OC symptoms and greater hyposensitivity were more likely to exhibit ARFID symptoms related to poor appetite. These findings indicate that OC symptoms alone may not underlie the presentation of eating disorder symptoms; rather, it is a combination of factors that may lead to eating disorder symptomatology in the general population.

Concerning the OCD population, Chapters 6–8 also highlighted the complexity of atypical eating in this group using a mixed methods approach. Both participants with OCD and HCPs reported that OC symptomatology itself may be a mechanism of atypical eating; for example, individuals with contamination fears may avoid eating certain foods due to concerns about becoming unwell. Similarly, characteristics of individuals with OCD were also noted to underlie atypical eating. Whilst not formally recognised as OC symptoms, characteristics such as harm avoidance, perfectionism, and seeking control are common traits observed in OCD. Almost all participants with OCD (Chapter 7) reported using eating behaviours as a means of gaining control to avoid anxiety or achieve consistency.

HCPs also reported that co-occurring disorders and symptoms were important in the presentation of atypical eating patterns in individuals with OCD; this was not mentioned by participants with OCD themselves, highlighting how incorporating the views of those affected and HCPs can provide a more comprehensive overview of atypical eating in OCD. In particular, reference was made to autism spectrum disorder and OCPD, which are common comorbidities of OCD. In autism spectrum disorder, atypical eating is often driven by rigidity, routine and sensory difficulties; these traits are also proposed to underlie the atypical eating behaviours observed in OCD (Kinnaird et al., 2019; Nimbley et al., 2022).

Moreover, perfectionism, a core symptom of OCPD and a transdiagnostic factor for eating disorders, was also reported to underlie the eating patterns of those with OCD in the current thesis.

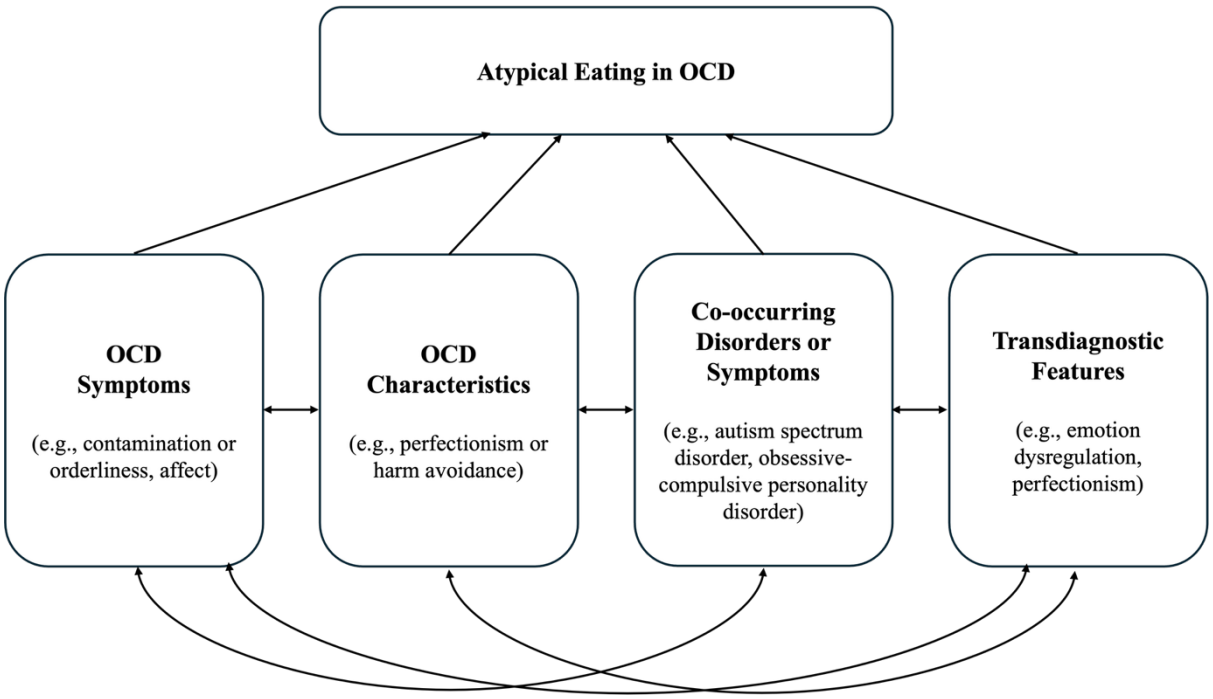
However, understanding the determinants of atypical eating in OCD is complicated by the significant overlap among these mechanisms. OC symptoms, OCD characteristics, co-occurring disorders and transdiagnostic risk factors frequently intersect, which can make it difficult to identify the nature of atypical eating in OCD. Perfectionism can be used to illustrate this complexity. For example, the consumption of specific foods may reflect underlying perfectionistic tendencies; however, perfectionism is recognised as a core diagnostic feature of OCPD and is a common characteristic of individuals with OCD (Halmi et al., 2005). Furthermore, perfectionism also functions as a transdiagnostic risk factor for eating disorders and is frequently observed in autism spectrum disorder, often manifesting as rigid, rule bound eating behaviours (Carpita et al., 2022; Fairburn et al., 2003). Therefore, it may be difficult to accurately identify which of these mechanisms might be driving atypical eating behaviours in individuals with OCD.

However, it is to be noted that there are factors beyond individual psychological and diagnostic mechanisms, such as environmental and cultural influences, which may also shape how atypical eating manifests in OCD. For instance, parenting practices that emphasise control, cleanliness, or emotional restraint could interact with early OC traits or symptoms to reinforce rigid or avoidant eating patterns. Similarly, cultural norms surrounding body ideals, food purity or dietary health may influence atypical eating among those with OCD and/or OC symptoms. Although these influences were beyond the remit of the current thesis, acknowledging them is important for understanding the multidimensional nature of atypical eating in OCD and may help guide future research in this area.

As described by Participant 4 (Chapter 8), atypical eating in OCD may result from several different pathways: *"People go to Santiago de Compostela using the Camino, but there are multiple Camino routes. There's lots of ways to get there, but that's the end result. I think that's what we may be talking about in psychiatry as well" (Participant 4).* This metaphor is particularly important in the context of atypical eating in OCD. The thesis set out to examine what factors may underlie atypical eating in OCD, yet there does not appear to be a clear-cut answer. Instead, atypical eating in OCD appears to be incredibly complex and may differ between individuals. In an attempt to simplify these relationships, Figure 9.1 presents a theoretical diagram of the psychological and diagnostic determinants of atypical eating in OCD, as informed by studies of the thesis.

Figure 9.1.

A theoretical diagram of the mechanisms underlying atypical eating in OCD



The assessment of atypical eating

Studies in this thesis also raised important considerations for the assessment of atypical eating in those with OCD and/or those showing high levels of OC symptoms. It was evident that current assessments may not capture the nuances of eating behaviours in these groups. For example, the EAT-26 (Garner et al., 1982) captures atypical eating behaviours associated with anorexia nervosa and bulimia nervosa; however, not all individuals with OCD will engage in such eating patterns due to concerns over weight and/or shape. Instead, eating behaviours may echo OCD symptomatology or be utilised as a means of control.

Going forward, it would be important to define atypical eating in OCD, which would then provide the theoretical framework to develop a tool which comprehensively assesses these behaviours. As described by Participant 2 (Chapter 8), once we can define atypical eating in OCD, we can then understand how prevalent it truly is: "*Once we can do that…you'll see, as much as fear of harm, disordered eating is in there" (Participant 2).*

A particular strength of the thesis was the use of qualitative methodologies to understand eating behaviours from the perspectives of those with OCD, as well as HCPs. Shifting from the use of quantitative methods, which utilise pre-existing measures of eating behaviours – often validated in non-OCD populations – provided a more comprehensive insight into the eating issues that manifest in individuals with OCD. In the qualitative studies presented in this thesis, atypical eating in OCD was characterised by food rigidity, selectivity and restriction due to wanting control, often reflecting the need for consistency or specific OC symptoms (e.g., contamination). In addition, participants reported

periods of overeating in attempt to self-soothe or regulate their emotions. These eating patterns appear to be distinct from those typically observed in individuals with an eating disorder; therefore, the development of a measure to assess atypical eating behaviours in the context of OCD may be more appropriate than utilising existing measures of eating behaviours. Without such a measure, there is a risk of OCD-related eating behaviours remaining poorly understood and/or managed.

In addition to self-report measures and clinical assessments of eating disorders, weight status is often used as a determinant of eating behaviour severity. However, as observed in Chapters 6–7, those with OCD often appeared physically healthy or were within a normal weight range, despite experiencing significant difficulties with their eating behaviours. This is also becoming more evident in individuals with an eating disorder (Harrop et al., 2023; Machado et al., 2017). Therefore, measures for atypical eating in OCD should not depend solely on objective or visible indicators, such as weight or the ability to eat a balanced diet. A more holistic measure would be more appropriate, as pathological eating patterns may be masked by a healthy appearance or weight status.

Relation to theoretical frameworks

The Transdiagnostic Model of Eating Disorders, coined by Fairburn and colleagues (2003), is particularly relevant for understanding eating challenges in those with OCD. This theoretical framework suggests that anorexia nervosa, bulimia nervosa and binge-eating disorder are maintained by at least one of four underlying cognitive mechanisms: clinical perfectionism, mood intolerance, interpersonal difficulties and core low self-esteem. Although originally conceptualised for eating disorders, these mechanisms are also evident among the OCD population. For example, those with OCD are more perfectionistic and are intolerant of emotions (e.g., anxiety caused by obsessions), compared to the general population (Cludius et al., 2022; See et al., 2022). The presence of these shared characteristics may help to explain the overlap in symptomatology between these conditions and increased rates of comorbidity.

However, The Transdiagnostic Model was developed prior to the recognition of ARFID, which does not account for the unique mechanisms which underlie this eating disorder, such as fearing the consequences of eating or sensory difficulties (APA, 2013, 2022; Zickgraf, Loftus, et al., 2022). In the current thesis, the need for control was observed to be a catalyst of atypical eating behaviours, which may also be relevant to ARFID. For example, controlling food intake or eating selectively may reduce anxiety associated with feared consequences of eating or aversive sensory experiences. Including the trait of control within the context of the Transdiagnostic Model could therefore offer a more suitable theoretical framework for understanding the broader range of atypical eating behaviours that present in OCD or those with OC symptoms.

Alternatively, the Experiential Avoidance model may more accurately reflect food avoidance in OCD. This model posits that negative evaluations of unwanted thoughts and emotions, coupled with the intolerance of experiencing them, lead individuals to seek control and actively avoid situations that cause distress (Kashdan et al., 2006). Experiential avoidance is well documented in OCD, where compulsions are performed to escape, suppress or neutralise the distress caused by obsessions (Silva et al., 2024). Applied to food avoidance in OCD, where individuals may limit intake due to sensory sensitivities or fear of aversive consequences (e.g., vomiting or gastrointestinal discomfort), the Experiential Avoidance Model offers a valuable framework for understanding the development of these pathological eating patterns.

There has also been a longstanding debate regarding whether eating disorders should be considered within obsessive-compulsive spectrum. The obsessive-compulsive spectrum refers to a group of disorders which share characteristics with OCD; these include neurological disorders (e.g., Tourette's syndrome and autism spectrum disorder), impulsive disorders (e.g., trichotillomania or gambling) and disorders characterised by bodily sensations and appearance (e.g., anorexia nervosa or body dysmorphic disorder). It is proposed that eating disorders should be considered within this spectrum (Hollander et al., 2005). Although the thesis did not explicitly aim to examine the nosology of OCD and eating disorders, the findings provide novel insight from the perspectives of individuals with OCD. In Chapter 7, individuals who were diagnosed with eating disorders perceived their challenges with eating to be directly affected by their OC symptoms. Some even questioned their eating disorder diagnosis, attributing their eating patterns entirely to OCD, thereby challenging existing nosological boundaries.

Additionally, HCPs reported that impulsivity and compulsivity in some patients may influence their eating patterns. Within the theoretical framework of obsessive-compulsive spectrum disorders, impulsivity and compulsivity is recognised as a continuum. For example, anorexia nervosa is primarily considered a compulsive disorder, whereas bulimia nervosa is regarded as both impulsive and compulsive. Despite the differences in impulsivity and compulsivity, the eating disorders within this spectrum demonstrate several similarities with OCD, such as obsessional thoughts about food and rigid meal preparation rituals. Therefore, understanding atypical eating within the context of the obsessive-compulsive spectrum may explain why such behaviours occur, and why they frequently overlap with OCD.

Strengths and limitations

The studies presented in this thesis offer valuable insight into the understudied area of atypical eating in OCD. However, several limitations warrant consideration. For instance, while the empirical studies had relatively modest sample sizes, larger samples would have enhanced the generalisability of the findings to the broader OCD population and the general population. Though, this limitation primarily applies to the quantitative studies, as the sample sizes of the qualitative studies were in line with the principles of Reflexive Thematic Analysis (Braun & Clarke, 2022). As such, these studies did not aim to provide generalisable findings, but to understand the nuances of atypical eating in OCD, which the quantitative studies could not capture. Although the findings of the qualitative study may not be generalisable to the entire OCD population, they provide a foundation for future research in this understudied area.

Another limitation of the OCD study samples was the lack of demographic diversity, as participants were predominantly female and of white ethnic and ancestral backgrounds. Previous research has suggested that belonging to an ethnic minority group may be a risk for atypical eating, and that males with OCD have a higher likelihood of developing disorders compared to their female counterparts (Cederlöf et al., 2015; Meier et al., 2015; Solmi et al., 2014). Therefore, future research should aim to recruit more diverse samples to ensure inclusion and better understand eating patterns among higher-risk populations.

As outlined throughout the thesis, a central limitation was the use of atypical eating measures that have not been validated specifically for use in OCD populations, which also highlights a broader issue: the absence of assessment tools designed to capture atypical eating behaviours unique to OCD.

Consequently, the quantitative studies were restricted to measuring established atypical eating behaviours, such as those relating to anorexia nervosa or food approach tendencies, rather than the distinctive eating patterns described in the later qualitative studies.

Concerning study development, the empirical studies of this thesis were not preregistered, which can be considered a limitation. However, it is to be noted preregistration was not a standard expectation when the research was designed. The exploratory nature of the PhD also meant that preregistration could have constrained meaningful data exploration and the identification of additional patterns not specified at the outset (Lakens et al., 2024). Whilst this flexibility was important for the thesis aims, there remains the risk of researcher bias and analytical flexibility, which may compromise objectivity during study analyses. Preregistering the hypotheses and the analysis plan prior to conducting the studies would have increased transparency and confidence in the findings.

A further limitation is that a-priori power analyses were not used to calculate the samples for the quantitative studies. Consequently, these studies may not have had sufficient power to detect smaller, but still meaningful, relationships between OC symptoms and atypical eating behaviours. Therefore, the findings of these studies, particularly the non-significant ones, should be interpreted with caution. To address this limitation, post-hoc power analyses were conducted, showing that while the studies generally had sufficient power for the correlational analyses, several of the multiple regression models were underpowered. However, it has been argued that post-hoc analyses offer limited value when interpreting such findings (Zhang et al., 2019).

Furthermore, another statistical limitation was the inclusion of several mediating factors, particularly in Chapter 6. Given the degree of overlap among these mediating variables, the unique contribution of each mediator may have been reduced due to shared variance with other mediators. Despite these statistical challenges, including multiple mediators offered benefit for the theoretical understanding of atypical eating in OCD as it accounted for the multifaceted nature of pathological eating patterns.

The OCD studies did not exclude those without an OCD diagnosis, which can provide both challenges and advantages. To ensure rigor in the study findings, it would be appropriate to have a confirmed diagnosis. However, as much as 70% of individuals with OCD may go undiagnosed, limiting their ability to access support from clinical services (Wahl et al., 2010; Ziegler et al., 2021). As reported in the earlier general population chapters, prevalence rates of OCD were approximately 20%, which contrasts the 1-5% suggested in the current literature (Adam et al., 2012; CilliÇilli et al., 2004; Fineberg, Hengartner, Bergbaum, Gale, Gamma, et al., 2013; Ruscio et al., 2010). Hence, by not excluding these individuals, the study findings may be more reflective of the true OCD population. Going forward, it would be important to affirm potential diagnoses using clinical assessment tools, such as the Y-BOCS (Goodman et al., 1989).

In addition, the studies in the thesis demonstrated several strengths and significantly contributed to the understanding of atypical eating in OCD. Although existing research has established a relationship between OCD and atypical eating, the majority of studies have predominantly focused on individuals with a primary eating disorder. In contrast, the studies presented in this thesis specifically examined atypical eating in individuals with OCD and those with OC symptoms, whilst also considering the continuum of atypical eating behaviours that may not meet the clinical threshold for intervention. By encompassing a broad range of atypical eating behaviours, a more comprehensive overview of atypical eating in OCD and those with OC symptoms was established.

A core strength of the study was the use of the Mixed Methods Approach, proposed by Tashakkori (2010). Using both qualitative and quantitative methodologies helped to minimise the shortcomings of each, such as the limited generalisability of qualitative samples and use of predetermined questionnaires in quantitative research. In the present thesis, the quantitative studies highlighted an association between OC symptoms and atypical eating behaviours, which was then supplemented by the qualitative interview studies, allowing a deeper understanding of eating patterns in this group. Considering the viewpoints of individuals with OCD and HCPs also provided a more comprehensive understanding of atypical eating and OCD and OC symptoms.

Directions for future research

While the studies presented throughout this thesis have contributed significantly to the understanding of atypical eating in OCD and those with OCD symptoms, further exploration is clearly warranted. For example, as described earlier, exploring the wider range of risk factors associated with atypical eating was not within the remit of the current programme of research. However, understanding whether there are additional factors implicated in the expression of atypical eating in OCD may elucidate why these behaviours occur. Important considerations include environmental factors, such as peer influence, social media exposure or food insecurity (Chung et al., 2021; Hazzard et al., 2020; Holland & Tiggemann, 2016; Keel & Forney, 2013; Sanzari et al., 2023).

In addition to environmental influences, familial and cultural contexts may also play a critical role in the development and maintenance of atypical eating behaviours in OCD. Parenting styles characterised by overprotection, excessive control, or excessive preoccupation with orderliness and cleanliness may inadvertently reinforce compulsive or avoidant eating behaviours in children predisposed to OC symptoms (Joshua et al., 2024; Sahota et al., 2024). Furthermore, cultural attitudes towards foods or body image may shape how obsessive–compulsive symptoms develop within the context of atypical eating behaviours (Abdoli et al., 2024; Deek et al., 2024). For example, in cultures where thinness or dietary restraint are valued, perfectionistic tendencies could exacerbate or manifest as restrictive eating or the drive for thinness. Investigating these familial and sociocultural influences would extend the current thesis findings by understanding atypical eating within a broader environmental and developmental framework, which can inform the development of interventions to address these challenges among the OCD population.

There is also a need to explore whether an interaction between OC symptoms and atypical eating behaviours occurs over time. The studies in this thesis adopted a cross-sectional design and examined the predictive effect of OC symptoms on eating behaviours, which does not provide insight into whether there is a bi-directional relationship between OC symptoms and atypical eating. An earlier study has provided some evidence for a bidirectional relationship between obsessions and eating disorder symptoms, however research of this nature remains within its infancy (Kinkel-Ram et al., 2022).

Following on from the findings of Kinkel-Ram and colleagues (2022), it would also be important to further explore which component of OC symptoms is associated with atypical eating. Indeed, both previous research and the present thesis have suggested that certain OC symptom subtypes, such as contamination, may be linked to atypical eating behaviours (Levinson et al., 2019; Peters et al., 2019). These preliminary findings highlight the need for further exploration, potentially employing qualitative methodologies, due to limitations in existing measures of atypical eating behaviours.

An important observation of Chapter 7 was that individuals with OCD were able to maintain a balanced diet, despite their atypical eating. However, this observation did not utilise food diary methods to collect data on diet and nutritional intake. It would be imperative to examine whether diet in OCD is significantly affected by atypical eating, as this would provide greater insight into whether the impact of atypical eating extends beyond psychopathological difficulties to diet and nutrition. Research of this nature is particularly important, given that OCD is associated with significant health risks, such as cardiovascular disease (Isomura et al., 2018, 2021).

A common theme identified during Chapter 8 was the impact of co-occurring disorders, particularly autism spectrum disorder, among those with OCD. Given that behaviours in OCD often overlap with those observed autism spectrum disorder, it would be important to control for autistic traits when understanding the relationship between OCD and atypical eating (Gadelkarim et al., 2019; O'Loghlen et al., 2024). This consideration is particularly relevant in the context of ARFID, which frequently occurs in autistic individuals.

It would also be of interest to examine the childhood eating experiences of adults with OCD or atypical eating in children with OCD. Research suggests that selective eating or overeating during childhood can persist and predict eating disorders during adulthood (Derks et al., 2022; Herle et al., 2020; Zohar et al., 2025). Moreover, in the qualitative studies of the thesis, there was some indication that atypical eating patterns in OCD were evident during childhood; however, these findings were limited. There would be merit in exploring whether atypical eating behaviours in childhood are associated with OCD in later life; this could help identify a potential marker for OCD during the developmental stage, when younger individuals may not yet be able to verbalise their obsessions.

Considerations for clinical practice

Findings from the thesis provide an important understanding of atypical eating in relation to OCD and/or OC symptoms. From this, there are several considerations for clinical practice. First and foremost, the impact of OCD on eating should be given more attention in clinical settings. OCD has a significant impact on functioning, with several studies demonstrating this in various aspects of life, including employment and relationships (Cicek et al., 2013; Coban & Tan, 2019). Eating is also a core component of day-to-day life; however, it appears to be overlooked in OCD. Individuals must make decisions around food, source ingredients and prepare meals, all of which can be burdensome to those who experience significant challenges with OCD. Despite this, many of the participants with OCD in Chapter 7 reported that their eating behaviours were not acknowledged.

Moreover, stemming from earlier in the discussion, it is important to consider the most appropriate way to assess atypical eating in OCD. Whilst developing a tool to assess atypical eating could be feasible, there can be challenges in understanding how and where to implement such assessments. Firstly, not all individuals with OCD will be under a specialist OCD service; some may be overseen by their GP or receive support through Talking Therapies. In some cases, individuals with OCD may not seek support or a diagnosis, leaving them unknown to clinical services and unlikely to receive clinical attention. Studies utilising public and patient involvement and HCP insight may help to provide suggestions on how to navigate these complexities.

HCPs also provided valuable insight into the barriers that currently exist when identifying and managing atypical eating in OCD. These included limited resources, challenges in collaborative working and the

need for improvements in knowledge. While it is not possible to address all these concerns using the findings of the thesis, a promising suggestion may be to develop a training package for staff supporting individuals with OCD and concurrent atypical eating behaviours. Other suggestions for improvement could be to facilitate collaborative working between OCD services and eating disorder services; however, the feasibility of such recommendations would have to be discussed among clinical services.

In most cases, eating disorders services provide support only to individuals who meet the clinical threshold for an eating disorder, thereby limiting the support available for those who may fall below this threshold. Developing a clinical pathway to prevent subclinical eating disorders from worsening may not be feasible; however, there are potential options to enhance current treatment or care for those experiencing both OCD and atypical eating behaviours. For example, there may be merit in adapting current treatments for OCD and eating disorders, such as CBT, so that it is inclusive of both OCD and atypical eating behaviours (Simpson et al., 2013). This would also take into account the perspectives outlined in Chapter 7, where some participants explained that their OCD and eating disorder were treated separately, despite their symptoms being intertwined.

Moreover, whilst there exists guidance for health conditions, such as diabetes or cardiovascular disease, these do not consider the nuances of OCD. Additionally, there are no tailored resources for those with OCD or OC symptoms who experience atypical eating behaviours. As a result, individuals may seek help independently using potentially unreliable resources. Recent evidence shows that many individuals obtain dietary advice or guidance for health using social media platforms, often from sources that are not medically approved (Denniss et al., 2023; Segado-Fernández et al., 2025). Consequently, this may cause more harm, such as the development of disordered eating patterns (Moorman et al., 2020; Peebles et al., 2012; Thompson et al., 2023). There is a need for medically approved advice and adapted resources for individuals with OCD, which can be disseminated via the NHS, whether this is through healthcare services or approved social media platforms. Examples of tailored resources may include guidance on how to identify atypical eating, where to seek help, or how to manage a healthy diet at home within the context of one's OCD symptoms. Alternatively, guidance on interpreting nutritional information may be of benefit (Moorman et al., 2020). Again, it would be appropriate to seek the views of those affected by OCD, as well as HCPs, to develop a suitable resource.

Concluding remarks

This doctoral programme of research highlights that adults with OCD, as well as those exhibiting high levels of OC symptomatology in the general population, often display atypical eating behaviours. However, these behaviours may be overlooked in the presence of severe OC symptoms or when individuals are able to mask their pathological eating patterns. Despite this, such behaviours can cause significant impairments to mental and physical health, as well as day-to-day functioning. These limited studies indicate that there is no single cause for atypical eating in OCD; rather, it likely arises from a complex interplay of risk factors, including OCD characteristics and symptomatology, transdiagnostic factors and traits associated with other disorders. What is evident, however, is that these difficulties must be recognised in clinical practice. Although there are perceived barriers to treating and managing atypical eating in OCD, a greater understanding of the issues involved could inform the development of tailored interventions, helping to reduce the psychological and physical burden on affected individuals.

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Appendices

Ethics Approval Notifications

Study 1 (Chapter 3)

Appendix 1 – Study 1 Primary Ethics Approval

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO Sonay Kucukterzi

CC Dr Amanda Ludlow

FROM Dr Rosemary Godbold, Health, Science, Engineering & Technology ECDA Vice Chair

DATE 29/09/2021

Protocol number: **LMS/PGR/UH/04696**

Title of study: Exploring eating behaviours in relation to obsessive-compulsive disorder traits within the adult population

Your application for ethics approval has been accepted and approved with the following conditions by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez
Professor Naomi Fineberg

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Validity:

This approval is valid:

From: 01/10/2021

To: 31/01/2022

Study 2 and 3 (Chapters 4–5)

Appendix 2 – Study 2 and 3 Primary Ethics Approval

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO Sonay Kucukterzi-Ali

CC Dr Amanda Ludlow

FROM Dr Rosemary Godbold, Health, Science, Engineering & Technology ECDA Vice Chair

DATE 12/04/2022

Protocol number: **LMS/PGR/UH/04943**

Title of study: Exploring the relationship between traits of obsessive-compulsive disorder and selective eating in children and adults

Your application for ethics approval has been accepted and approved with the following conditions by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Amanda Ludlow
Dr Roberto Gutierrez
Professor Naomi Fineberg

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Validity:

This approval is valid:

From: 12/04/2022

To: 01/09/2023

Appendix 3 – Study 2 and 3 Amendment Approval

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Rebecca Knight, Health, Science, Engineering & Technology ECDA Vice Chair
DATE	15/07/2022

Protocol number:	**aLMS/PGR/UH/04943(1)**
Title of study:	Exploring the relationship between traits of obsessive-compulsive disorder and selective eating in children and adults

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Amanda Ludlow
Dr Roberto Gutierrez
Professor Naomi Fineberg

Modification: detailed in EC2

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Study 4 and 5 (Chapters 6–7)

Appendix 4 – Study 4 and 5 Primary Ethics Approval

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay Kucukterzi-Ali
CC	Dr Amanda Ludlow
FROM	Dr Simon Trainis, Health, Science, Engineering & Technology ECDA Chair
DATE	17/10/2023

Protocol number: **LMS/PGR/UH/05462**

Title of study: Exploring eating behaviours in adults with obsessive-compulsive disorder

Your application for ethics approval has been accepted and approved with the following conditions by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Validity:

This approval is valid:

From: 17/10/2023

To: 01/07/2024

Appendix 5 - Study 4 and 5 Amendment Approval (1)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay Kucukterzi-Ali
CC	Dr Amanda Ludlow
FROM	Dr Simon Trainis, Health, Science, Engineering & Technology ECDA Chair
DATE	28/11/2023

Protocol number:	**aLMS/PGR/UH/05462(1)**
Title of study:	Exploring eating behaviours in adults with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

All modifications as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 6 - Study 4 and 5 Amendment Approval (2)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-Gul Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Rebecca Knight, Health, Science, Engineering and Technology ECDA Vice-Chair
DATE	16/01/2024

Protocol number: **aLMS/PGR/UH/05462(2)**

Title of study: Exploring eating behaviours in adults with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

Change to how participants access the study and other modifications as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 7 - Study 4 and 5 Amendment Approval (3)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-Gul Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Simon Trainis, Health, Science, Engineering and Technology ECDA Chair
DATE	08/04/2024

Protocol number: **aLMS/PGR/UH/05462(3)**

Title of study: Exploring eating behaviours in adults with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

Recruit control participants who do not have OCD and increase maximum sample size from 8 to 12, as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Study 6 (Chapter 8)

Appendix 8 – Study 6 Primary Ethics Approval

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-gul Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Rosemary Godbold, Health, Science, Engineering & Technology ECDA Vice Chair
DATE	07/08/2023

Protocol number: **LMS/PGR/UH/05427**

Title of study: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Your application for ethics approval has been accepted and approved with the following conditions by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez
Professor Naomi Fineberg

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Validity:

This approval is valid:

From: 07/08/2023

To: 31/08/2023

Appendix 9 – Study 6 Amendment Approval (1)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-Gul Kucukterzi
CC	Dr. Amanda Ludlow
FROM	Dr. Rosemary Godbold, Health, Science, Engineering and Technology ECDA Vice-Chair
DATE	15/11/2023

Protocol number:	**aLMS/PGR/UH/05427(1)**
Title of study:	Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez
Professor Naomi Fineberg

Modification:

All modifications as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 10 – Study 6 Amendment Approval (2)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	**Sonay Kucukterzi-Ali**
CC	**Dr Amanda Ludlow**
FROM	**Dr Rebecca Knight; Health, Science, Engineering and Technology Vice-Chair**
DATE	**19/12/2023**

Protocol number: **aLMS/PGR/UH/05427(2)**

Title of study: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

As detailed in the approved EC2 form.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 11 – Study 6 Amendment Approval (3)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-Gul Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Simon Trainis, Health, Science, Engineering and Technology ECDA Chair
DATE	03/05/2024

Protocol number: **aLMS/PGR/UH/05427(3)**

Title of study: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

Amended consent forms and participant information sheets as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 12 – Study 6 Amendment Approval (4)

University of Hertfordshire UH

HEALTH, SCIENCE, ENGINEERING AND TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO	Sonay-Gul Kucukterzi
CC	Dr Amanda Ludlow
FROM	Dr Simon Trainis, Health, Science, Engineering and Technology ECDA Chair
DATE	17/05/2024

Protocol number: **aLMS/PGR/UH/05427(4)**

Title of study: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Your application to modify and extend the existing protocol as detailed below has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

Dr Roberto Gutierrez 749132
Professor Naomi Fineberg
Professor Tim Gale

Modification:

Increased sample sizes for part 1 and 2 of the study as detailed in the approved EC2 application.

General conditions of approval:

Ethics approval has been granted subject to the standard conditions below:

Original protocol: Any conditions relating to the original protocol approval remain and must be complied with.

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.

Appendix 13 – Study 6 Health Research Authority Approval

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Dr Amanda Ludlow
Reader in Psychology
University of Hertfordshire
College Lane
AL10 9AB

Email: HCRW.approvals@wales.nhs.uk

29 April 2024

Dear Dr Ludlow

HRA and Health and Care Research Wales (HCRW) Approval Letter – re-issued

Study title:	**Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder**
IRAS project ID:	**331793**
Protocol number:	**LMS/PGR/UH/05427(2)**
REC reference:	**24/HRA/1428**
Sponsor	**University of Hertfordshire**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Study Documents

Study 1 (Chapter 3)

Appendix 14 – Study 1 Advert

Appendix 15 – Study 1 Participant Information Sheet

UNIVERSITY OF HERTFORDSHIRE

ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

1 **Title of study**

Exploring eating behaviours in relation to obsessive-compulsive disorder traits within the adult population

2 **Introduction**

You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link:

https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs
(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

3 **What is the purpose of this study?**

The purpose of this study is to explore whether different eating patterns or behaviours are related to traits of obsessive-compulsive disorder (OCD). Within clinical populations, it has been observed that those with OCD may be more likely to have different eating behaviours – this may include 'fussy' eating, dieting or having specific mealtime routines. However, it is not clear which behaviours occur or whether these behaviours also occur in those who have traits of OCD. It is hoped that this study will help provide a better understanding of what eating behaviours may be related to OCD traits, which can then also be explored in clinical populations. Please note this study is being undertaken as a part of a PhD research project which explores atypical eating behaviours related to the OCD population.

4 **Do I have to take part?**

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason. A decision to withdraw at any time, or a decision not to take part at all, will not affect any treatment/care that you may receive (should this be relevant).

5 **Are there any age or other restrictions that may prevent me from participating?**

All adults over the age of 18 years can participate in the study, however those with a diagnosis of OCD or an eating disorder will not be able to take part. Participants must have sufficient understanding of the English language in order to complete the online questionnaires.

6 **How long will my part in the study take?**

If you decide to take part in this study, you will be involved in it for approximately 45 to 60 minutes.

7 **What will happen to me if I take part?**

If you choose to take part, you will first be asked to provide your informed consent to go ahead with the research. Upon providing informed consent, there will be a series of questions to obtain some demographic information about yourself (e.g. your sex and age). Thereafter you will be presented with a series of questionnaires to explore OCD traits and eating behaviours. When all the study measures have been completed, you will be provided with some more information on the study and the researcher's contact details should you have any questions.

8 **What are the possible disadvantages, risks or side effects of taking part?**

Some of the questionnaires used in the study are used to assess traits of OCD and disordered eating patterns, and it is possible that some of the questions may make you feel distressed. If you feel uncomfortable at any point during the study, you can pause completing the questionnaires or withdraw from the research. The study questionnaires are not designed to diagnose OCD or disordered eating but if you feel concerned about the questions being asked, information on how to seek support will be provided at the end of the study.

9 **What are the possible benefits of taking part?**

Eating is a crucial part of our day-to-day lives and it is fundamental for our physical and mental health. Disordered, or atypical, eating behaviours (such as fussy eating, food neophobia or excessive dieting) may have a negative impact on our health, but it is not well understood what sorts of eating behaviours occur in those with OCD or OCD traits. Therefore, designing support to help individuals with atypical eating behaviours is limited by our lack of knowledge. By taking part in this research you will be helping researchers to understand what sorts of eating behaviours may occur in the general population, which may also occur in clinical populations.

10 **How will my taking part in this study be kept confidential?**

Your participation will remain anonymous through the use of an anonymity code which you will create at the start of the study. By using an anonymity code, the research team will not be able to trace your data back to you. The anonymised data from this study will only be accessed by the research team, consisting of the lead researcher and their research supervisor. All the anonymised data provided will be stored in password protected files, on a password protected computer, for no more than three years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval form the University of Hertfordshire.

11 **What will happen to the data collected within this study?**

The data will be anonymised prior to storage. The data collected will be stored secure server, in which the database will be password protected and encrypted, for no more than three years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

12 **Will the data be required for use in further studies?**

It is possible that the data you provide will be reanalysed in for a future ethically approved study. The data to be re-used will be anonymised and will only be used in studies undertaken within the University of Hertfordshire.

14 **Who has reviewed this study?**

This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

The UH protocol number is LMS/PGR/UH04696

15 **Who can I contact if I have any questions?**

If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by phone or by email:

Lead researcher:

Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor:

Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 16 – Study 1 Online Consent Form

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC3
CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned *[please write a 6 digit anonymity code below using letters and numbers, e.g. SK1705]*

……

Please make a note of this code as if you choose to withdraw from the study, the researcher will need this to remove your data from the study.

hereby freely agree to take part in the study entitled *exploring eating behaviours in relation to obsessive-compulsive disorder traits within the adult population*

(UH Protocol number LMS/PGR/UH04696)

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it.

☐

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

☐

3 I have been given information about the risks of my suffering harm or adverse effects and I agree to complete any required health screening questionnaire in advance of the study. I have been told about the aftercare and support that will be offered to me in the event of this happening, and I have been assured that all such aftercare or support would be provided at no cost to myself. In signing this consent form I accept that medical attention might be sought for me, should circumstances require this.

☐

4 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used, including the possibility of anonymised data being deposited in a repository with open access (freely available).

☐

5 I understand that my participation in this study may reveal findings that could indicate that I may require medical advice. In that event, I will be informed and advised to consult my GP and I acknowledge that, following discussion, I may be required by the University to withdraw from the study. If, during the study, evidence comes

to light that I may have a pre-existing medical condition that may put others at risk, I understand that the University will refer me to the appropriate authorities and that I will not be allowed to take any further part in the study.

☐

6 I understand that if there is any revelation of unlawful activity or any indication of non-medical circumstances that would or has put others at risk, the University may refer the matter to the appropriate authorities.

☐

7 I have been told that I may at some time in the future be contacted again in connection with this or another study.

☐

Signature of participant……..…Date……

Signature of (principal)
investigator……Date……

Name of (principal) investigator /SONAY KUCUKTERZI-ALI]

……

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Appendix 17 – Study 1 Debrief Sheet

Debrief sheet

Project title: Exploring eating behaviours in relation to obsessive-compulsive disorder traits within the adult population

Thank you for participating in the above study. The purpose of this research is to help us understand what eating behaviours are related to traits of obsessive-compulsive disorder (OCD). Currently, it is understood that those with an OCD diagnosis are more likely to present with disordered eating issues, similar to what is seen in eating disorders (e.g. Williams, Brown & Sawyer, 2017; Cederlof et al., 2015; Zickgraf, Franklin & Rozin, 2016; Bang et al., 2020; Kambanis et al., 2020). For example, this may include food restriction, engaging in purging, avoiding foods based on what they look or smell like, or emotional eating (Zickgraf et al., 2016; Garcia et al., 2020; Albertella et al., 2021; Vanzhula, Kinkel-Ram & Levinson, 2021). However, we do not know if these eating patterns and behaviours are also present in those with milder traits of OCD. Moreover, it is not clear how this impacts diet and nutrition.

By taking part in this study you will help the research team to understand what types of eating behaviours may be related to traits of OCD in the general population. The findings can then help to inform further research which explores eating issues in those with OCD traits. The results may also help to identify what issues may be prevalent in clinical populations. Eating is fundamental to our physical health, but it can often go overlooked when other issues present more strongly. The researchers hope that the findings can raise awareness for eating issues.

If taking part in this research has raised any concerns for you, you may wish to contact your GP or the organisations below:

OCD action
Helpline: 0300 636 5478
Helpline email: support@ocdaction.org.uk

Beat Eating Disorders

Support for students:
Student helpline: 0808 801 0811
Email: studentline@beateatingdisorders.org.uk
tel:0808 801 0811
Support for adults (18+ years)
Helpline: 0808 801 0677
Email: help@beateatingdisorders.org.uk

Thank you once again for your contribution to this research. Should you have any questions or queries about the study, please contact:

Sonay Kucukterzi (researcher) Email: s.kucukterzi@herts.ac.uk
Dr. Amanda Ludlow (Supervisor) Email: a.ludlow@herts.ac.uk

Study 2 and 3 (Chapters 4–5)

Appendix 18 – Study 2 and 3 Participant Information Sheet

UNIVERSITY OF HERTFORDSHIRE ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

Title of study

Exploring the relationship between obsessive-compulsive traits and selective eating in adults

Introduction

You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link:

https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs

(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

What is the purpose of this study?

The purpose of this study is to explore what factors may be responsible for our eating patterns and behaviours. Eating behaviours vary between individuals, but some examples include food fussiness or preferences for foods based on their colour or texture. Research has suggested that obsessive-compulsive traits may be related to food choices. However, there are also other factors which could guide an individual's eating behaviours. For example, those who experience sensory sensitivity may have preferences for foods of a particular texture or taste, or those who engage in ritualistic behaviours may desire consistency with their mealtimes. It is hoped that the study will provide a better understanding of whether certain traits affect our food choices and eating behaviours, or whether this is dependent of a range of other factors, such as sensory sensitivity.

We also understand that sensory sensitivity and repetitive behaviours change as people get older. As a part of the study, we would also like to explore whether these factors and eating behaviours differ between adults and children. Please note this study is being undertaken as a part of a PhD research project which explores atypical eating behaviours related to the obsessive-compulsive traits in the general population.

Do I have to take part?

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

Are there any age or other restrictions that may prevent me from participating?

All adults over the age of 18 years can participate in the study, however those with a diagnosis of OCD or an eating disorder are advised to not take part. Participants must also have sufficient understanding of the English language in order to complete the online questionnaires.

How long will my part in the study take?

If you decide to take part in this study, you will be involved in it for approximately 25 minutes.

What will happen to me if I take part?

If you choose to take part, you will first be asked to provide your informed consent to go ahead with the research. Upon providing informed consent, there will be a series of questions to obtain some demographic information about yourself (e.g. your sex and age). Thereafter you will be presented with a series of questionnaires to explore OCD traits, eating behaviours and factors which may affect your food choices. When all the study measures have been completed. The researcher's contact details will also be available should you have any questions.

What are the possible disadvantages, risks or side effects of taking part?

Some of the questionnaires used in the study are used to assess obsessive-compulsive traits and eating behaviours, and it is possible that some of the questions may make you feel distressed. If you feel uncomfortable at any point during the study, you can pause completing the questionnaires or withdraw from the research. The study questionnaires are not designed to diagnose OCD or disordered eating but if you feel concerned about the questions being asked, information on how to seek support will be provided at the end of the study.

What are the possible benefits of taking part?

Eating is a crucial part of our day-to-day lives and it is fundamental for our physical and mental health. Disordered, or atypical, eating behaviours (such as fussy eating or food neophobia) in excess may have a negative impact on our health, but it is not well understood what may underlie these eating behaviours. Therefore, designing support to help individuals with atypical eating behaviours is limited by our lack of knowledge. By taking part in this research you will be helping researchers to understand why these eating behaviours occur in the general population, which may also occur in clinical populations.

How will my taking part in this study be kept confidential?

Your participation will remain anonymous through the use of an anonymity code which you will create at the start of the study. By using an anonymity code, the research team will not be able to trace your data back to you. The anonymised data from this study will only be accessed by the research team, consisting of the lead researcher and their research supervisor. All the anonymised data provided will be stored on a password protected file on the one drive which will only be accessible to main research team, for no more than five years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval form the University of Hertfordshire.

What will happen to the data collected within this study?

The data will be anonymised prior to storage. The data collected will be stored secure server, in which the database will be password protected and encrypted, for no more than five years after completion the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

Will the data be required for use in further studies?

The results of this study will be used as part of the researchers PhD thesis, and to promote future research understanding and recognition amongst experiences of eating and diet in obsessive-compulsive traits. The results may also be published. Any information that could be used to identify individuals will be removed from published material.

Who has reviewed this study?

This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority.

The UH protocol number is aLMS/PGR/UH/04943(1)

Who can I contact if I have any questions?

If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by email:

Lead researcher: Sonay Kucukterzi-Ali - s.kucukterzi@herts.ac.uk

Research supervisor: Dr Amanda Ludlow - a.ludlow@herts.ac.uk

Appendix 19 – Study 2 and 3 Online Consent Form

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC3
CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned…

[please write your Prolific ID OR a 6 digit anonymity code below consisting of the first and last letter of your forename and surname, and your day of birth. E.g., if your name is Jane Doe and you were born on the 17th July, your code would be JEDE17]

……

hereby freely agree to take part in the study entitled *Exploring the relationship between obsessive-compulsive traits and selective eating in adults*

(UH Protocol number LMS/PGR/UH/04943(1))

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it. ☐

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason. ☐

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used, including the possibility of anonymised data being deposited in a repository with open access (freely available). ☐

Anonymity/Prolific code ……..…Date……

(Numbers and letters)

Signature of (principal)
investigator……Date……

Name of (principal) investigator /SONAY KUCUKTERZI-ALI]

……

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study

Appendix 20 – Study 2 and 3 Debrief Sheet

Debrief sheet

Project title: Exploring the relationship between traits of obsessive-compulsive traits and selective eating in children and adults

Thank you for participating in this study. The purpose of this study is to help the researchers understand what may underlie the reasons for our eating behaviours, and whether this differs across children and adults.

Previous research has found that children and adults with traits of obsessive-compulsive disorder (OCD) are more likely to have selective eating behaviours, such as food fussiness. However, we do not know if these eating behaviours are due to traits of OCD or other factors, such as sensory sensitivity, or a mixture of both. It is hoped that the findings from this study will provide the researchers with a better understanding of why eating behaviours occur in the general population, which can also guide research within those who have a diagnosis of OCD.

By taking part in this study you have helped the research team to better there is a relationship between obsessive-compulsive traits and eating behaviours. Eating is fundamental to our physical health, but it can often go overlooked when other issues present more strongly. We hope that carrying out further vital research can help to raise awareness for eating behaviours in those with mental health difficulties.

Thank you once again for your contribution to this research. Should you have any questions or queries about the study, please contact. Should you have any questions or queries about the study, please contact:

Sonay Kucukterzi (researcher) Email: s.kucukterzi@herts.ac.uk
Dr. Amanda Ludlow (Supervisor) Email: a.ludlow@herts.ac.uk

If taking part in this research has raised any concerns for you, you may wish to contact your GP or the organisations below:

OCD action
Helpline: 0300 636 5478
Helpline email: support@ocdaction.org.uk

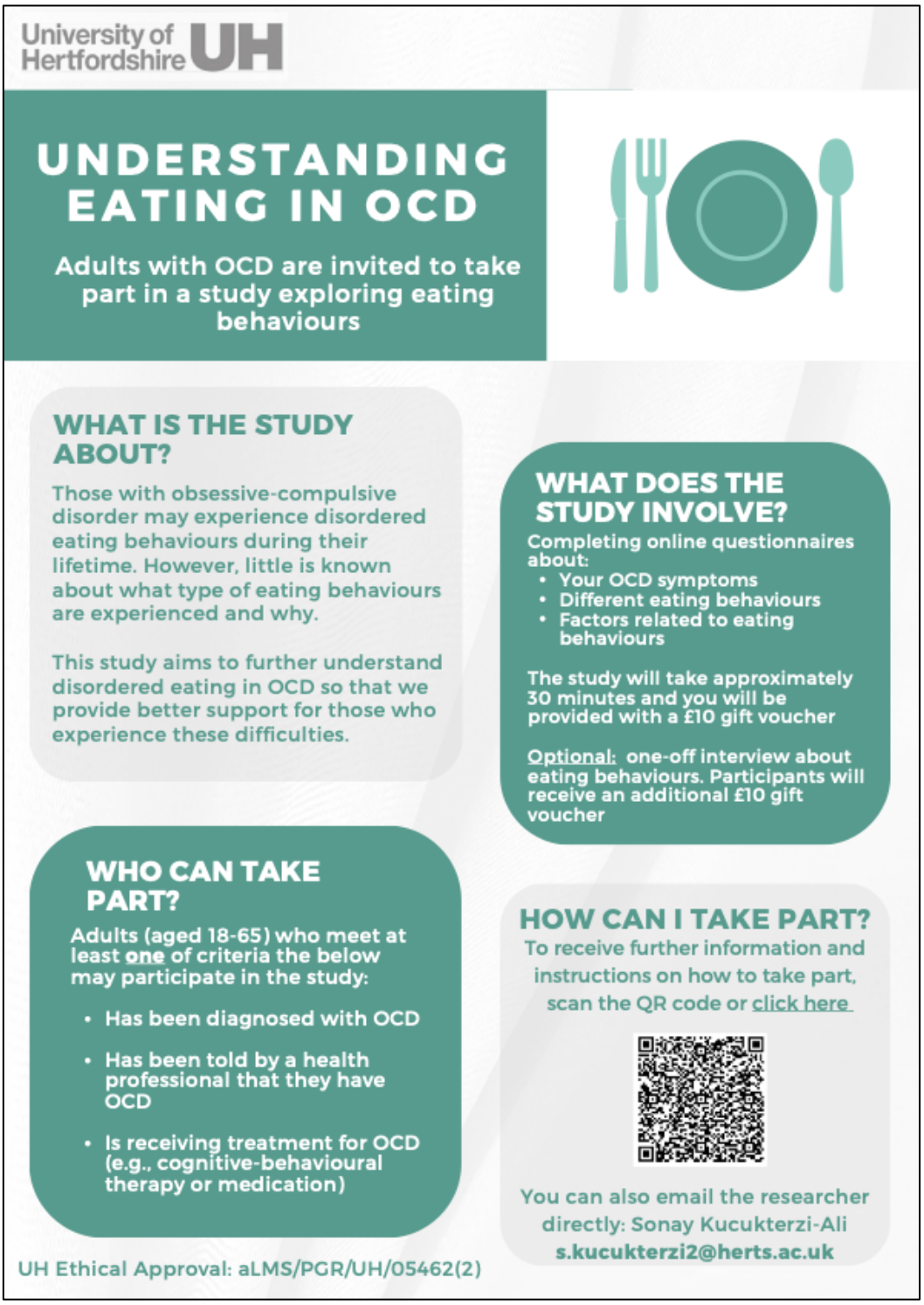
Beat Eating Disorders
Support for students:
Student helpline: 0808 801 0811

Email: studentline@beateatingdisorders.org.uk

Support for adults (18+ years)
Helpline: 0808 801 0677
Email: help@beateatingdisorders.org.uk

Study 4 and 5 (Chapters 6–7)

Appendix 21 – Study 4 and 5 OCD Participants Advert



Appendix 22 – Study 4 OCD Participant Information Sheet (Questionnaire)

UNIVERSITY OF HERTFORDSHIRE

ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

1 **Title of study**

Exploring eating behaviours in adults with obsessive-compulsive disorder (part one)

2 **Introduction**

You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link:

https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs
(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this

3 **What is the purpose of this study?**

The purpose of the study is to explore eating behaviours in those with obsessive-compulsive disorder (OCD). Previous research has highlighted that individuals with OCD may be more likely to be diagnosed with an eating disorder, or present with certain eating behaviours. Eating behaviours can range from disordered eating, which often includes excessive restriction or bingeing, or general eating behaviours, such as fussy eating. Whilst we know that those with OCD are more likely to display different eating behaviours, less is known about which specific eating behaviours are the most common.

Moreover, we do not know why those with OCD are more likely to have different eating behaviours. Some research has found that other factors, such as sensory sensitivity or emotion regulation, may influence our food choices and eating behaviours. Therefore, the study also hopes to find out whether other factors may be involved in the eating behaviours of those with OCD.

It is hoped that the study will provide a better understanding of which eating behaviours occur in those with OCD and why. Findings from the study will help to inform future research which aims to provide better support for those with OCD who experience difficulties with their eating. Please note this study is being undertaken as a part of a PhD research project which explores atypical eating behaviours in OCD.

4 **Do I have to take part?**

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

5 **Are there any age or other restrictions that may prevent me from participating?**

This study is aimed at adults (aged 18-65) those with a diagnosis of OCD or those self identifying with having OCD. This is defined by one of the below:

- Have a diagnosis of OCD
- Have been told they have OCD by health professional
- Self identifies with having OCD
- Has received treatment or is receiving treatment for OCD (e.g., psychological therapies including cognitive behavioural therapy, or medication).

To participate, you must also have sufficient understanding of the English language to complete the online questionnaires.

6 **How long will my part in the study take?**

If you decide to take part in this study, you will be involved in it for approximately 45 minutes.

7 **What will happen to me if I take part?**

The study is completed online and you can complete this independently, or with the researcher. If you would someone to help with completing the questionnaires, the researcher can provide you with support in person, over the phone or over video call (e.g., over Microsoft teams). Please send an email to the researcher (s.kucukterzi2@herts.ac.uk) if you would like support with the questionnaires.

If you choose to take part, you will first be asked to provide your informed consent to go ahead with the research. Upon providing informed consent, there will be a series of questions to obtain some demographic information about yourself (e.g., your sex and age). Thereafter you will be presented with a series of questionnaires about your OCD symptoms, eating behaviours and factors which may contribute to eating behaviours. When all the study measures have been completed. The researcher's contact details will also be available should you have any questions.

When the study is completed, you will be asked to provide an email to receive your gift voucher. You will also have the opportunity to express interest in a further study which involves interviewing those with OCD about their eating behaviours.

8 **What are the possible disadvantages, risks or side effects of taking part?**

Some of the questionnaires used in the study are used to assess OCD symptoms and eating behaviours, and it is possible that some of the questions may make you feel distressed. If you feel uncomfortable at any point during the study, you can pause completing the questionnaires or withdraw from the research. The study questionnaires are not designed to diagnose OCD or disordered eating but if you feel concerned about the questions being asked, information on how to seek support will be provided at the end of the study.

9 **What are the possible benefits of taking part?**

Eating is a crucial part of our day-to-day lives, and it is fundamental for our physical and mental health. Disordered, or atypical, eating behaviours (such as restrictive or fussy eating), in excess, may have a negative impact on our health. Whilst we know that these eating behaviours may be more common in OCD, we do not know why. Therefore, designing support to help individuals with

atypical eating behaviours is limited by our lack of knowledge. By taking part in this research you will be helping researchers to understand why these eating behaviours occur in those with OCD, which may help to provide better support for those who experience these difficulties.

You will also be provided with a £10 gift voucher for taking part.

10 **How will my taking part in this study be kept confidential?**

Your participation will remain anonymous through the use of an anonymity code which you will create at the start of the study. By using an anonymity code, the research team will not be able to trace your data back to you. The anonymised data from this study will only be accessed by the research team, consisting of the lead researcher and their research supervisor. All the anonymised data provided will be stored on a password protected file on the one drive which will only be accessible to main research team, for no more than five years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval form the University of Hertfordshire.

11 **What will happen to the data collected within this study?**

The data will be anonymised prior to storage. The data collected will be stored secure server, in which the database will be password protected and encrypted, for no more than five years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

You will also be asked to provide your email during the study, but this is solely for the purposes of sending a digital gift card. You will not be contacted about the study, or future studies, unless you consent to this at the end of the questionnaire.

12 **Will the data be required for use in further studies?**

The results of this study will be used as part of the researchers PhD thesis, and to promote future research understanding and recognition amongst experiences of eating and diet in those with OCD. The results may also be published. Any information that could be used to identify individuals will be removed from published material.

13 **Who has reviewed this study?**

This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

The UH protocol number is LMS/PGR/UH/05462(2).

14 **Who can I contact if I have any questions?**

If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by phone or by email:

Lead researcher:

Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor:

Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 23 – Study 4 Controls Screening Participant Information Sheet

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

PARTICIPANT INFORMATION SHEET

Study screening: Exploring eating behaviours in adults with obsessive-compulsive disorder

What is the purpose of this screening study?

- This is a screening assessment for a study which explores eating behaviours in those with and without obsessive-compulsive disorder (OCD).
- We are seeking participants without OCD for this part of the study. Please only complete this screening assessment if you are interested in the full study.
- If you are eligible to participate in the full study, you will be notified via the researcher and given access via Prolific.

Are there any restrictions to participating in the screening assessment?

- Participants must be aged between 18-50 years and able to read and comprehend written English.

How long will the screening assessment take and what do I need to do?

- Two minutes
- You will first complete a consent form before moving onto the brief study screening assessment.

What are the possible disadvantages, risks or side effects of taking part?

- The screening assessment is used to assess OCD symptoms which some may find distressing. If you feel uncomfortable at any point, you can pause the screening assessment or withdraw.

How will my taking part in this study be kept confidential?

- Your participation will remain confidential using your Prolific ID. The data from this study will only be accessed by the research team, consisting of the lead researcher and their research supervisor. All data will be stored on a password-protected file on the one drive for no more than five years after completion of the study for the purpose of publication, as per the data protection law (1988).

What will happen to the data collected within this screening assessment?

- The data will be anonymised prior to storage. The data collected will be stored on a secure server, in which the database will be password protected and encrypted, for no more than five years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

Will the data be required for use in further studies?

- The results of this study will be used as part of the researchers PhD thesis. The results may also be published. Any information that could be used to identify individuals will be removed from published material.

Who has reviewed this study?

- This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority.

  UH protocol number: LMS/PGR/UH/05462(3)

Who can I contact if I have any questions?
If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by email:

Lead researcher:
Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor:
Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 24 – Study 4 Controls Participant Information Sheet (Full Questionnaire Study)

UNIVERSITY OF HERTFORDSHIRE

ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

1. Title of study
Exploring eating behaviours in adults with obsessive-compulsive disorder

2. Introduction

You are invited to participate in this full study as you qualified during an earlier screening assessment. This full study is conducted by a PhD student who is exploring eating behaviours in adults with and without obsessive-compulsive disorder (OCD).

Before you decide whether to participate in the full study, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link: https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs

(after accessing this website, scroll down to Letter S where you will find the regulation)
Thank you for reading this.

3. What is the purpose of this study?
The purpose of the study is to explore eating behaviours in those without obsessive-compulsive disorder (OCD). Previous research has highlighted that individuals with OCD may be more likely to be diagnosed with an eating disorder or engage in disordered eating, but less is known about how they compare to those who do not have OCD.

It is hoped that the study will provide a better understanding of which eating behaviours occur in those with and without OCD. Findings from the study will help to inform future research which aims to provide better support for those with OCD who experience difficulties with their eating.

4. Do I have to take part?
It is completely up to you whether you decide to take part in this study. If you decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you must complete it. You are free to withdraw at any stage without giving a reason.

5. Are there any age or other restrictions that may prevent me from participating?
This study is aimed at adults aged between 18-50, without a diagnosis of OCD. To participate, you must also have sufficient understanding of the English language to complete the online questionnaires.

6. How long will my part in the study take?
If you decide to take part in this study, you will be involved in it for approximately 25 minutes.

7. What will happen to me if I take part?

If you choose to take part, you will first be asked to provide your informed consent to go ahead with the research. Upon providing informed consent, you will then enter your Prolific ID and answer some demographic questions (e.g., gender and age). Thereafter you will be presented with a series of questionnaires about eating behaviours and factors which may contribute towards eating behaviours. The researcher's contact details will also be available should you have any questions.

8. What are the possible disadvantages, risks or side effects of taking part?
Some of the questionnaires used in the study are used to assess OCD symptoms and eating behaviours. If you feel uncomfortable or distressed at any point during the study, you can pause completing the questionnaires or withdraw from the research. The study questionnaires are not designed to diagnose OCD or disordered eating but if you feel concerned about the questions being asked, information on how to seek support will be provided at the end of the study.

9. What are the possible benefits of taking part?
Eating is a crucial part of our day-to-day lives, and it is fundamental for our physical and mental health. Disordered, or atypical, eating behaviours may have a negative impact on our health. By taking part in this study, you will be helping the researchers to understand why atypical eating behaviours occur in those with and without OCD. It is also hoped that the findings from the study will contribute towards future research which aims to provide better support for those who experience these difficulties.

10. How will my taking part in this study be kept confidential?
Your participation will remain confidential using your Prolific ID. The data from this study will only be accessed by the research team, consisting of the lead researcher and their research supervisor. All the data provided will be stored on a password protected file on the one drive which will only be accessible to main research team, for no more than five years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval form the University of Hertfordshire.

11. What will happen to the data collected within this study?
The data will be anonymised prior to storage. The data collected will be stored on a secure server, in which the database will be password protected and encrypted, for no more than five years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

You will also be asked to provide your email during the study, but this is solely for the purposes of sending a digital gift card. You will not be contacted about the study, or future studies, unless you consent to this at the end of the questionnaire.

12. Will the data be required for use in further studies?
The results of this study will be used as part of the researchers PhD thesis, and to promote future research understanding and recognition amongst experiences of eating and diet in those with OCD. The results may also be published. Any information that could be used to identify individuals will be removed from published material.

13. Who has reviewed this study?
This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

The UH protocol number is LMS/PGR/UH/05462(3)

14. Who can I contact if I have any questions?
If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by phone or by email:

Lead researcher:
Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor:
Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 25 – Study 4 OCD Participant and Controls Online Consent Form

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC3
CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned… *[please write your anonymity code]*

……

hereby freely agree to take part in the study entitled *Exploring eating behaviours in adults with obsessive-compulsive disorder*

UH Protocol number LMS/PGR/UH/05462(2)

1 I confirm that I have been given a Participant Information Sheet giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it.

☐

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

☐

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used.

☐

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study

Appendix 26 – Study 5 OCD Participant Information Sheet (Semi-Structured Interview)

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')
FORM EC6: PARTICIPANT INFORMATION SHEET

Title of study

Exploring eating behaviours in adults with obsessive-compulsive disorder (part two)

Introduction

You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link:
https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs
(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

What is the purpose of this study?

Similarly to the first part of this study, the purpose of the current study is to explore eating behaviours in those with obsessive-compulsive disorder (OCD). Part one of this study, and most existing research, has explored eating behaviours in OCD using standardised questionnaires and assessments. Whilst standardised questionnaires help to improve the understanding of eating behaviours, interviews may help us to better understand the lived experience of those with OCD. Therefore, the current study aims to explore eating behaviours in OCD using an interview where participants can speak freely about their experiences.

It is hoped that the current study will provide more insight into eating behaviours in those with OCD. Findings from the study will help to inform future research which aims to provide better support for those with OCD who experience difficulties with their eating.

Please note this study is being undertaken as a part of a PhD research project.

Do I have to take part?

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

Are there any age or other restrictions that may prevent me from participating?

As you have taken part in part one of this study, you are eligible to participate in the current study.

How long will my part in the study take?

If you decide to take part in this study, you will be involved in it for approximately 45-60 minutes.

What will happen to me if I take part?

Prior to participating in the study, you will be given the opportunity to discuss any questions about the research. If you choose to proceed with the study, you will be asked to provide your informed consent

using a verbal consent form. Upon providing informed consent, you will complete an interview with the researcher. Questions in the interview will ask about your experiences with eating.

Interviews will be completed over the phone or via video call (e.g., Microsoft teams or Zoom). You are welcome to choose which option is best for you. The interview itself will be audio-recorded, but no identifiable information will be collected during the recording. After completing the interview, you will be provided with the researchers contact details if you have any questions.

As a small thank you, you will also be provided with a £10 gift voucher for taking part. When the study is completed, you will be asked to provide an email to receive your gift voucher.

What are the possible disadvantages, risks or side effects of taking part?
Some of the questions in the study will ask about your OCD symptoms and experiences with disordered eating behaviours, and it is possible that some of the questions may make you feel distressed. If you feel uncomfortable at any point during the study, you can pause the interview or withdraw from the research. The study questionnaires are not designed to diagnose OCD or disordered eating but if you feel concerned about the questions being asked, information on how to seek support will be provided at the end of the study.

What are the possible benefits of taking part?
Eating is a crucial part of our day-to-day lives, and it is fundamental for our physical and mental health. Disordered, or atypical, eating behaviours (such as restrictive or fussy eating), in excess, may have a negative impact on our health. Whilst we know that these eating behaviours may be more common in OCD, we do not know why. Therefore, designing support to help individuals with atypical eating behaviours is limited by our lack of knowledge. By taking part in this study, you will be helping the researchers to understand the lived experience of OCD and atypical eating behaviours. It is hoped that the findings from the study will contribute towards future research and interventions which aim to support individuals affected by these issues.

How will my taking part in this study be kept confidential?
Your participation will remain anonymous through the use of an anonymous participant identifier (PID). By using an anonymous PID, your data will not be traced back to you. Your anonymised data from this study will only be accessed by the research team. All the anonymised data provided will be stored in password protected files on the UH one drive for no more than three years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval from the University of Hertfordshire.

What will happen to the data collected within this study?
The data will be anonymised prior to storage. The data collected will be stored secure server (UH one drive), in which the database will be password protected and encrypted, for no more than three years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

Will the data be required for use in further studies?
The results of this study will be used as part of the researchers PhD thesis, and to promote future research understanding and recognition amongst experiences of eating and diet in those with OCD. The results may also be published. Any information that could be used to identify individuals will be removed from published material.

Who has reviewed this study?
This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

The UH protocol number is LMS/PGR/UH/05462(2).

Who can I contact if I have any questions?
If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by phone or by email:

Lead researcher:
Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor:
Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 27 – Study 5 OCD Verbal Participant Consent Form (Semi-Structured Interview)

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC3
VERBALCONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

Study: Exploring eating behaviours in adults with obsessive-compulsive disorder

Verbal informed consent form

Researcher to seek and record informed oral consent, after the participant has had sufficient time to think about whether they want to take part.

Please check the boxes below to record that the below questions have been asked and affirmed.

Participant Name: ……..

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it. ☐

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason. ☐

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used, including the possibility of anonymised data being deposited in a repository with open access (freely available). ☐

Signature of (principal) investigator……Date……

Name of (principal) investigator /SONAY KUCUKTERZI-ALI]

Appendix 28 – Study 4 and 5 Debrief Sheet for OCD Participants and Controls

Project title: Exploring eating behaviours in adults with obsessive-compulsive disorder

Thank you for participating in this study. The purpose of this study is to help the researchers understand what may underlie the reasons for our eating behaviours.

Previous research has found that adults with obsessive-compulsive disorder (OCD) or OCD traits are more likely to have an eating disorder or disordered eating behaviours, such restrictive eating or food avoidance. However, we do not know if these eating behaviours are due to OCD symptoms or other factors, such as sensory sensitivity or perfectionism, or a combination of both. It is hoped that the findings from this study will provide the researchers with a better understanding of why eating behaviours occur in those with OCD, which can inform future research and potential ways to support those with OCD and eating difficulties.

By taking part in this study you have helped the research team to better understand if there is a relationship between OCD and eating behaviours. Eating is fundamental to our physical health, but it can often go overlooked when other issues present more strongly. We hope that carrying out further vital research can help to raise awareness for eating behaviours in those with mental health difficulties.

If taking part in this research has raised any concerns for you, you may wish to contact your GP or the organisations below:

OCD action
Helpline: 0300 636 5478
Helpline email: support@ocdaction.org.uk

Beat Eating Disorders
Support for students:
Student helpline: 0808 801 0811
Email: studentline@beateatingdisorders.org.uk

Support for adults (18+ years)
Helpline: 0808 801 0677
Email: help@beateatingdisorders.org.uk

Thank you once again for your contribution to this research. Should you have any questions or queries about the study, please contact. Should you have any questions or queries about the study, please contact:

Sonay Kucukterzi (researcher) Email: s.kucukterzi@herts.ac.uk

Dr. Amanda Ludlow (Supervisor) Email: a.ludlow@herts.ac.uk

Study 6 (Chapter 8)

Appendix 29 – Study 6 Flyer

University of Hertfordshire UH

UNDERSTANDING EATING IN OCD

HEALTHCARE PROFESSIONALS ARE INVITED TO COMPLETE A BRIEF SURVEY ON EATING DISTURBANCES IN OCD

WHAT IS THE STUDY ABOUT?

Those with OCD are more likely to experience eating disturbances such as anorexia nervosa and avoidant-restrictive food intake disorder. However, little is known about the presentation of these eating disturbances and why those with OCD are at greater risk.

This study aims to further understand eating disturbances in OCD so that we can provide better support for those who experience these difficulties.

WHAT DOES THE STUDY INVOLVE?

Completing a **10 minute** survey about your views on eating disturbances in OCD. Participation is anonymous.

All participants will receive a CPD certificate.

Optional: UK-based healthcare professionals can also participate in a one-off interview about eating disturbances. All interviews are completed remotely.

WHO CAN TAKE PART?

- **Healthcare professionals** from any clinical background (e.g., psychiatrists, nurses, therapists, psychologists etc.)
- Must have a minimum of one year's experience working with the OCD population
- Open to healthcare professionals regardless of the country they practice in

HOW DO I TAKE PART?

You can participate by scanning the QR code or visiting:
http://tiny.cc/OCDclinicianstudy

For any questions or further information, please contact Sonay Kucukterzi-Ali
s.kucukterzi2@herts.ac.uk

UH Ethical Approval: aLMS/PGR/UH/05427(2)

Appendix 30 – Study 6 Participant Information Sheet (Survey)

Part 1 Participant Information Sheet (Version 3, 10/04/2024)
IRAS ID: 331793

PART 1 PARTICIPANT INFORMATION SHEET

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')

PARTICIPANT INFORMATION SHEET
Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Introduction
You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part.

The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link: https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs (after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

What is the purpose of this study?
Research indicates a proportion of those with obsessive-compulsive disorder (OCD) may present with eating disturbances. Eating disturbances refer to a broad range of atypical eating behaviours; some of these eating behaviours may require clinical intervention (e.g., anorexia or bulimia nervosa), whereas some behaviours (e.g., food fussiness or food neophobia) may occur, but are less severe and do not warrant clinical intervention.

The present study aims to explore the presence and management of eating disturbances in OCD, from the perspective of healthcare professionals.

Do I have to take part?
Participating in this study is voluntary. Agreeing to participate in the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

Are there any age or other restrictions that may prevent me from participating?
Clinicians, from any profession or country, who have worked with the OCD population for

1+ years can take part in the study. Participants must also have sufficient understanding of the English language in order to complete the study.

How long will my part in the study take?
Approximately 10 minutes

What will happen to me if I take part?
All aspects of the study will be completed using an online survey platform. Prior to participating in the study, you will be asked to provide your informed consent. Thereafter, you will be you will be asked to complete a brief survey about your clinical experience and observations of eating disturbances in OCD.

If you are a healthcare professional practicing in the United Kingdom, you also have the option to express an interest in a further study which involves completing an interview about your perspectives on eating disturbances in OCD.

What are the possible disadvantages, risks or side effects of taking part?
It is unlikely that there will be any risks involved with taking part, however if you feel uncomfortable at any point during the study you can withdraw without giving any reason.

What are the possible benefits of taking part?
Eating disturbances can have serious, adverse effects on an individual's mental and physical wellbeing, but these symptoms are not well understood in those with OCD. By taking part in the current study you will be contributing towards better knowledge of the eating disturbances which present in those diagnosed with OCD. It is hoped that the insight you provide will help to guide future research, prevention, and intervention. As a small thank you, you will also be provided with a Continuing Professional Development (CPD) certificate.

How will my taking part in this study be kept confidential?
Throughout the study, your identity will be kept anonymous through the use of a participant identification code (PID). By using an anonymous PID, your data will not be traced back to you. Your anonymised data from this study will only be accessed by the research team. All the anonymised data provided will be stored in password-protected drive, for no more than three years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval from the University of Hertfordshire. Any identifiable information (e.g., your name or email) will be kept safe on a secured, password protected drive, which can only be accessed by the researcher.

What will happen to the data collected within this study?

The data collected in this study will be used to help us better understand eating disturbances in OCD. All data provided in the study will be anonymised prior to storage. The data collected will be stored secure server, in which the database will be password protected and encrypted, for no more than three years after completion of the study (in accordance with the APA and BPS regulations). In the hope to publish the findings in this time, after which time it will be destroyed under secure conditions.

How will we use information about you?

We will need to use information from you this research project. This information will include your participant ID and email address. People will use this information to do the research and make sure that the research is being done properly. People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead. We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is stored?

You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.

Where can you find out about how your information is stored?

You can find out more about how we use your information by:

- Emailing the researcher via s.kucukterzi2@herts.ac.uk or;
- By visiting www.hra.nhs.uk/information-about-patients/ or;
- Contacting the University of Hertfordshire's Data Protection Officer
  Telephone: 01707 285900
  Email: dataprotection@herts.ac.uk
  Address: DPO, Room LB156, Office of the Vice-Chancellor, Main Building, University of Hertfordshire, College Lane, Hatfield, Hertfordshire AL10 9AB

Will the data be required for use in further studies?

The results of this study will be used as part of the researcher's PhD thesis, and to provide directions for future research in the area. The findings may also be published in an academic journal. Any information that could be used to identify individuals will be removed from published material.

Who has reviewed this study?

This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority. The UH protocol number is aLMS/PGR/UH/05427(4).

If I need to make a complaint, how can I do this?
Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Researcher contact details:

If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by email:

Lead researcher: Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor: Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 31 – Study 6 Consent Form (Survey)

Online informed consent form, Version 2 (09/04/2024)
IRAS ID: 331793

Online Informed Consent Form

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')
FORM EC3
CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

Title of project: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Principal Investigator: Sonay Kucukterzi-Ali

I, the undersigned… [please write a six-digit anonymity code]
……

hereby freely agree to take part in the study entitled Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

(UH Protocol number aLMS/PGR/UH/05427(4))

1 I confirm that I have been given a Participant Information Sheet (Version 3, 10/04/2024; a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used).

- I consent

- I do not consent

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Appendix 32 – Study 6 Participant Information Sheet (Semi-Structured Interview)

Part 2 Participant Information Sheet (Version 3, 10.04.2024)
IRAS ID: 331793

PART 2 PARTICIPANT INFORMATION SHEET

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')
FORM EC6: PARTICIPANT INFORMATION SHEET

1 **Title of study**
Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder.

2 **Introduction**
You are being invited to take part in a study for a PhD. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part.

The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via this link:
https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs
(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

3 **What is the purpose of this study?**
Research indicates that a proportion of those with obsessive-compulsive disorder (OCD) may be diagnosed with an eating disorder (ED) at some point during their lifetime, or present with disordered eating behaviours. In most cases, OCD precedes an ED diagnosis and is suggested to be a risk factor for ED development. Those with OCD and an ED are more likely to experience negative global outcomes.

Much of the research into EDs and OCD has focused on OCD symptomatology in EDs, without considering how or why eating disturbances occur in those with primary OCD. Research which has considered eating disturbances in OCD has concentrated on prevalence and comorbidity rates. Consequently, less is known about eating disturbances in OCD.

Given the severity of EDs, it would be of importance to explore how eating disturbances manifest in those with OCD. Furthermore, as OCD often precedes an ED, identifying factors which might enable eating disturbances could aid in the prevention of harmful eating behaviours developing. Insight from clinicians who have worked with the OCD population

would provide further direction for research in the area to support both prevention and intervention.

Please note this study is being undertaken as a part of a PhD research project which explores eating disturbances in the OCD population.

4 **Do I have to take part?**
Participating in this study is voluntary. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to participate in the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

5 **Are there any age or other restrictions that may prevent me from participating?**
Clinicians, from any profession, who have worked with the OCD population for at least one year are welcome to participate in the study. In order to participate you must have sufficient understanding of the English language in order to complete the interview.

6 **How long will my part in the study take?**
It is expected that the study will take approximately 45-60 minutes to complete.

7 **What will happen to me if I take part?**
Prior to participating in the study, you will be asked to provide your informed consent to go ahead with the research. Upon providing informed consent, you will complete a short questionnaire to obtain some demographic information (e.g., clinical profession, length of time working with OCD service users). Thereafter, you will complete an interview with the researcher. Questions in the interview will ask about your views on eating disturbances in OCD. You will have the option to complete the interview face-to-face, in your preferred location, or remotely over the phone, or on MS teams. The interview itself will be audio-recorded, but no identifiable information will be collected during the recording. After completing the interview, you will be provided with the researchers contact details if you have any questions.

As the study is utilising a qualitative approach, the researcher may contact you after the data analysis to gather your opinion on the findings.

8 **What are the possible disadvantages, risks or side effects of taking part?**
It is unlikely that there will be any risks involved with taking part, however if you feel uncomfortable at any point during the study you can withdraw without giving any reason.

9 **What are the possible benefits of taking part?**
Eating disorders can have serious, adverse effects on an individual's mental and physical wellbeing, but these symptoms are not well understood in those with OCD. Therefore, designing support to help OCD patients with eating disturbances is limited by our lack of knowledge. By taking part in the current study you will be contributing towards better knowledge of the eating disturbances which present in those diagnosed with OCD. It is hoped that the insight you provide will help to guide future research, prevention, and intervention.

As a small thank you, you will also be provided with a CPD certificate.

10 **How will my taking part in this study be kept confidential?**

Throughout the study, your identity will be kept anonymous through the use of a participant identification code (PID). By using an anonymous PID, your data will not be traced back to you. Your anonymised data from this study will only be accessed by the research team. All the anonymised data provided will be stored in password-protected drive, for no more than three years after completion of the study for the purpose of publication, as per the data protection law (1988). This study has received ethical approval from the University of Hertfordshire. Any identifiable information (e.g., your name or email) will be kept safe on a secured, password protected drive, which can only be accessed by the researcher.

11 **What will happen to the data collected within this study?**

The data collected in this study will be used to help us better understand eating disturbances in OCD. All data provided in the study will be anonymised prior to storage. The data collected will be stored on a secure server, in which the database will be password protected and encrypted, for no more than three years after completion of the study (in accordance with the APA and BPS regulations). Audio recordings of the interviews will be destroyed upon transcription. Direct quotes from the interview will be used in the study write up, future publications and presentations of the study findings. These quotes will be anonymised.

12 **How will we use information about you?**

We will need to use information from you this research project. This information will include your participant ID and email address. People will use this information to do the research and make sure that the research is being done properly. People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead. We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

13 **What are your choices about how your information is stored?**

You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.

14 **Where can you find out about how your information is stored?**

You can find out more about how we use your information by:

- Emailing the researcher via s.kucukterzi2@herts.ac.uk or;
- By visiting www.hra.nhs.uk/information-about-patients/ or;
- Contacting the University of Hertfordshire's Data Protection Officer
  Telephone: 01707 285900
  Email: dataprotection@herts.ac.uk
  Address: DPO, Room LB156, Office of the Vice-Chancellor, Main Building, University of Hertfordshire, College Lane, Hatfield, Hertfordshire AL10 9AB

15 **Will the data be required for use in further studies?**
The results of this study will be used as part of the researcher's PhD thesis, and to provide directions for future research in the area. The findings may also be published in an academic journal. Any information that could be used to identify individuals will be removed from published material.

16 **Who has reviewed this study?**
This study has been reviewed by the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority
The UH protocol number is aLMS/PGR/UH/05427(4)
The study has also received a favourable opinion from the Health Research Authority.

17 **If I need to make a complaint, how can I do this?**
Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Researcher contact details:

If you would like further information or would like to discuss any details personally, please get in touch with the lead researcher or research supervisor by email:

Lead researcher: Sonay Kucukterzi-Ali
Email: s.kucukterzi@herts.ac.uk

Research supervisor: Dr Amanda Ludlow
Email: a.ludlow@herts.ac.uk

Appendix 33 – Study 6 In-Person Consent Form (Semi-Structured Interview)

Written informed consent form Version 2 (09/04/2024)
IRAS ID: 331793

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')
FORM EC3
Written informed consent form

Title of project: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Principal Investigator: Sonay Kucukterzi-Ali

CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned… [please write your name]
……

hereby freely agree to take part in the study entitled Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

(UH Protocol number aLMS/PGR/UH/05427(4))

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used).

4 I give permission for the researchers to use direct quotes from my interview in the write up of the study, future publications and presentations of the findings. I understand that these quotes will be anonymous and contain no identifiable information.

5 I give permission for the interview to be audio recorded.

Participant signature ……..…Date……

Signature of (principal)
investigator……Date……
…
Name of (principal) investigator [SONAY KUCUKTERZI-ALI]

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Appendix 34 – Study 6 Verbal Consent Form (Semi-Structured Interview)

Verbal Informed Consent Form, Version 2 (09/04/2024)

IRAS ID: 331793

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')
FORM EC3
REMOTE CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

Title of project: Exploring clinician views of eating disturbances in those diagnosed with obsessive-compulsive disorder

Principal Investigator: Sonay Kucukterzi-Ali

Verbal informed consent form

Participant name:

Researcher to seek and record informed oral consent, after the participant has had sufficient time to think about whether they want to take part.
Please check the boxes below to record that the below questions have been asked and affirmed.

1 I confirm that I have been given a Participant Information Sheet (version 3, Date 10/04/2024; a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it. ☐

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason. ☐

3 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used)

4 I give permission for the researchers to use direct quotes from my interview in the write up of the study, future publications and presentations of the findings. I understand that these quotes will be anonymous and contain no identifiable information. ☐

5 I give permission for the interview to be audio recorded. ☐

Signature of (principal)
investigator……Date……
…

Name of (principal) investigator /SONAY KUCUKTERZI-ALI]

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Study Assessments and Interview Guides

OCD and OC Symptoms

Appendix 35 – Obsessive-Compulsive Inventory – Revised

The following statements refer to experiences that many people have in their everyday lives. Select the number that best describes **HOW MUCH** that experience has **DISTRESSED** or **BOTHERED** you during the **PAST MONTH.**

	Not at all - 0	A little - 1	Moderately - 2	A lot - 3	Extremely - 4
1. I have saved up so many things that they get in the way	○	○	○	○	○
2. I check things more often than necessary	○	○	○	○	○
3. I get upset if objects are not arranged properly	○	○	○	○	○
4. I feel compelled to count while I am doing things	○	○	○	○	○
5. I find it difficult to touch an object when I know it has been touched by strangers or certain people	○	○	○	○	○
6. I find it difficult to control my own thoughts	○	○	○	○	○
7. I collect things I don't need	○	○	○	○	○
8. I repeatedly check doors, windows, drawers etc.	○	○	○	○	○
9. I get upset if others change the way I have arranged things	○	○	○	○	○
10. I feel I have to repeat certain numbers	○	○	○	○	○
11. I sometimes have to wash or clean myself simply because I feel contaminated	○	○	○	○	○
12. I am upset by unpleasant thoughts that come into my mind against my will	○	○	○	○	○
13. I avoid throwing things away because I am afraid I might need them later	○	○	○	○	○
14. I repeatedly check gas and water taps and light switches after turning them off	○	○	○	○	○
15. I need things to be arranged in a particular way	○	○	○	○	○
16. I feel that there are good and bad numbers	○	○	○	○	○
17. I wash my hands more often and longer than necessary	○	○	○	○	○
18. I frequently get nasty thoughts and have difficulty in getting rid of them	○	○	○	○	○

Appendix 36 – Experience of OCD/OC Symptoms (Study 4 and 5 – OCD Participants)

Your experience with OCD

This part of the questionnaire asks about your experience with OCD. Not everyone with OCD will have a formal diagnosis. Some individuals may have been told they have OCD by a healthcare professional or have had treatment for their symptoms. Therefore, not all of these questions may be relevant to you and can be left blank.

Note: If you have not been diagnosed with OCD or told that you have OCD, but have received treatment for OCD you can describe this on the next page.

Do you have a formal diagnosis of OCD?

- ○ Yes
- ○ No
- ○ Unsure

Who formally diagnosed you with OCD?

- ○ Psychiatrist
- ○ GP
- ○ Therapist
- ○ Psychologist
- ○ Other professional (please describe below)
- ○ Not applicable

Other professional:

_____

If you do not have a formal OCD diagnosis, have you been told that you have OCD by a healthcare professional?

- ○ Yes
- ○ No
- ○ Unsure

Which professional told you that you had OCD?

- ○ Psychiatrist
- ○ GP
- ○ Therapist
- ○ Psychologist
- ○ Care co-ordinator
- ○ Other professional (please describe below)
- ○ Not applicable

Other professional:

_____

When were you diagnosed with OCD or told you had OCD? *Please write the nearest month and year*

_____

At what age did your OCD symptoms first start?

_____

Have you ever received treatment for OCD?

- ○ Yes
- ○ No
- ○ Not sure

Please select which treatments you have received for your OCD

☐ Medication(s) (e.g., SSRIs such as sertraline, fluoxetine etc.)

☐ Psychological therapies (e.g., CBT - cognitive-behavioural therapy or ERP - exposure and response prevention therapy)

☐ Both medication and psychological therapies

☐ Other, please describe _____

Are you currently receiving treatment for OCD?

- ○ Yes
- ○ No
- ○ Not sure

Please select which treatments you are currently receiving for your OCD

☐ Medication(s) (e.g., SSRIs such as sertraline, fluoxetine etc.)

☐ Psychological therapies (e.g., CBT - cognitive-behavioural therapy or ERP - exposure and response prevention therapy)

☐ Both medication and psychological therapies

☐ Other, please describe _____

When did you first start treatment for OCD? Please indicate your answer to the nearest month and year
Please leave blank if you have not received treatment

_____

Continued…

Does anyone in your family also have OCD? *This includes those who have an OCD diagnosis or have been told they have OCD by a healthcare professional, or those who have received treatment for OCD Please select all that apply*

- ☐ Mother
- ☐ Father
- ☐ Sister
- ☐ Brother
- ☐ Maternal grandmother
- ☐ Maternal grandfather
- ☐ Paternal grandmother
- ☐ Maternal grandfather
- ☐ Other extended family (e.g., aunt, uncle, cousins)
- ☐ Not applicable
- ☐ Prefer not to say

Have you ever been diagnosed with any other **mental health condition by a professional?**

- ○ Yes
- ○ No

If you answered yes, what were you diagnosed with?

_____

Appendix 37 – Nine-Item ARFID Screen

Please indicate your level of agreement:

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1. I am a picky eater	○	○	○	○	○	○
2. I dislike most of the foods that other people eat	○	○	○	○	○	○
3. The list of foods that I like and will eat is shorter than the list of foods I won't eat	○	○	○	○	○	○
4. I am not very interested in eating; I seem to have a smaller appetite than other people	○	○	○	○	○	○
5. I have to push myself to eat regular meals throughout the day, or to eat a large enough amount of food at meals	○	○	○	○	○	○
6. Even when I am eating a food I really like it is hard for me to eat a large enough volume at meals	○	○	○	○	○	○
7. I avoid or put off eating because I am afraid of gastrointestinal discomfort, choking or vomiting	○	○	○	○	○	○
8. I restrict myself to certain foods because I am afraid that other foods will cause gastrointestinal discomfort, choking or vomiting	○	○	○	○	○	○
9. I eat small portions because I am afraid of gastrointestinal discomfort, choking or vomiting	○	○	○	○	○	○

Appendix 38 – Eating Attitudes Test – 26

This is a screening measure to help you determine whether you might have an eating disorder that needs professional attention. This screening measure is not designed to make a diagnosis of an eating disorder or take the place of a professional consultation. Please fill out the below form as accurately, honestly and completely as possible. There are no right or wrong answers. All of your responses are confidential

Part A – Please select a response for the following statements:

	Always	Usually	Often	Sometimes	Rarely	Never
1. Am terrified about being overweight	○	○	○	○	○	○
2. Avoid eating when I am hungry	○	○	○	○	○	○
3. Find myself preoccupied with food	○	○	○	○	○	○
4. Have gone on eating binges where I feel that I may not be able to stop	○	○	○	○	○	○
5. Cut my food into small pieces	○	○	○	○	○	○
6. Aware of the calorie content of foods that I eat	○	○	○	○	○	○
7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes etc.)	○	○	○	○	○	○
8. Feel that others would prefer if I ate more	○	○	○	○	○	○
9. Vomit after I have eaten	○	○	○	○	○	○
10. Feel extremely guilty after eating	○	○	○	○	○	○
11. Am preoccupied with a desire to be thinner	○	○	○	○	○	○
12. Think about burning up calories when I exercise	○	○	○	○	○	○
13. Other people think that I am too thin	○	○	○	○	○	○
14. Am preoccupied with the thought of having fat on my body	○	○	○	○	○	○
15. Take longer than others to eat my meals	○	○	○	○	○	○
16. Avoid foods with sugar in them	○	○	○	○	○	○
17. Eat diet foods	○	○	○	○	○	○
18. Feel that food controls my life	○	○	○	○	○	○

Continued…

19. Display self-control around food	○	○	○	○	○	○
20. Feel that others pressure me to eat	○	○	○	○	○	○
21. Give too much time and thought to food	○	○	○	○	○	○
22. Feel uncomfortable after eating sweets	○	○	○	○	○	○
23. Engage in dieting behaviour	○	○	○	○	○	○
24. Like my stomach to be empty	○	○	○	○	○	○
25. Have the impulse to vomit after meals	○	○	○	○	○	○
26. Enjoy trying rich new foods	○	○	○	○	○	○

Part B:

	Never	Once a month or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
Gone on binges where you feel that you may not be able to stop? *(eating much more than most people under the same circumstances and feeling that eating is out of control)*	○	○	○	○	○	○
Ever made yourself sick (vomited) to control your weight or shape?	○	○	○	○	○	○
Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?	○	○	○	○	○	○
Exercised more than 60 minutes a day to lose or control your weight?	○	○	○	○	○	○

Have you lost 20 pounds or more in the past 6 months?

- ○ Yes
- ○ No

Weight and height

- ○ What is your current weight in kilos/kg? _____
- ○ What is your height in centimetres/cm? _____

Appendix 39 – Adult Picky Eating Questionnaire

Please read the following statements and select the response that best describes your current eating behaviour:

	Never	Rarely	Sometimes	Often	Always
1. I have a strong preference toward specific food presentation	○	○	○	○	○
2. I eat a limited number of items from each food group	○	○	○	○	○
3. I am often disengaged/uninvolved when sitting at the table for mealtimes	○	○	○	○	○
4. I reject bitter foods, even if they are only slightly bitter	○	○	○	○	○
5. I prefer foods of a particular colour	○	○	○	○	○
6. My usual diet lacks a variety of food groups	○	○	○	○	○
7. I usually feel that I have something better to do than eating	○	○	○	○	○
8. I reject sour foods	○	○	○	○	○
9. I cringe, cry or gag after seeing or eating certain foods	○	○	○	○	○
10. I do not like trying new foods	○	○	○	○	○
11. I avoid mealtimes	○	○	○	○	○
12. I am sad or disappointed when food is not prepared/cooked in the "right way"	○	○	○	○	○
13. I eat from a very narrow range of foods (fewer than 10 different foods)	○	○	○	○	○
14. I am immediately suspicious of food and feel the need to carefully inspect the majority of food	○	○	○	○	○
15. I eat foods in a specific sequence	○	○	○	○	○
16. I will not eat a food if I saw someone touch it	○	○	○	○	○

Appendix 40 – Adult Eating Behaviour Questionnaire

Please read each statement and select the box most appropriate to you:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I love food	○	○	○	○	○
I often decide that I don't like a food before tasting it	○	○	○	○	○
I enjoy eating	○	○	○	○	○
I look forward to mealtimes	○	○	○	○	○
I eat more when I'm annoyed	○	○	○	○	○
I often notice my stomach rumbling	○	○	○	○	○
I refuse new foods at first	○	○	○	○	○
I eat more when I'm worried	○	○	○	○	○
If I miss a meal I get irritable	○	○	○	○	○
I eat more when I'm upset	○	○	○	○	○
I often leave food on my plate at the end of a meal	○	○	○	○	○

I enjoy tasting new foods	○	○	○	○	○
I often feel hungry when I am with someone who is eating	○	○	○	○	○
I often finish my meals quickly	○	○	○	○	○
I eat less when I'm worried	○	○	○	○	○
I eat more when I'm anxious	○	○	○	○	○
Given the choice, I would eat most of the time	○	○	○	○	○
I eat less when I'm angry	○	○	○	○	○
I am interested in tasting new food I haven't tasted before	○	○	○	○	○

Continued…

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I eat less when I'm upset	○	○	○	○	○
I eat more when I'm angry	○	○	○	○	○
I am always thinking about food	○	○	○	○	○
I often get full before my meal is finished	○	○	○	○	○
I enjoy a wide variety of foods	○	○	○	○	○
I am often last at finishing a meal	○	○	○	○	○
I eat more and more slowly during the course of a meal	○	○	○	○	○
I eat less when I'm annoyed	○	○	○	○	○
I often feel so hungry that I have to eat something right away	○	○	○	○	○
I eat slowly	○	○	○	○	○
I cannot eat a meal if I have had a snack just before	○	○	○	○	○
I get full up easily	○	○	○	○	○
I often feel hungry	○	○	○	○	○
When I see or smell food that I like, it makes me want to eat	○	○	○	○	○
If my meals are delayed I get lightheaded	○	○	○	○	○
I eat less when I'm anxious	○	○	○	○	○

Appendix 41 – Adult Eating Behaviour Questionnaire – Food Fussiness Subscale

Please read each statement and select the box most appropriate to you:

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
I often decide that I don't like a food before tasting it	○	○	○	○	○
I refuse new foods at first	○	○	○	○	○
I enjoy tasting new foods	○	○	○	○	○
I am interested in tasting new food I haven't tasted before	○	○	○	○	○
I enjoy a wide variety of foods	○	○	○	○	○

Mediating factors

Appendix 42 – Sensory Perception Quotient – 35 Item

Please answer the following items by ticking the appropriate box. Please try to answer as honestly as possible:

	Strongly Agree	Agree	Disagree	Strongly Disagree
I would be able to distinguish different people by their smell	○	○	○	○
I would be able to detect if a strawberry was ripe by smell alone	○	○	○	○
I would be able to visually detect the change in brightness of light each time a dimmer control moved one notch	○	○	○	○
I would notice if someone added 5 drops of lemon juice to my cup of water	○	○	○	○
I would be able to hear a leaf move if blown by the wind on a quiet street	○	○	○	○
I would be able to taste the difference between two brands salty potato chips/crisps	○	○	○	○
I would *not* be able to feel the label at the back of my shirt even if thought about it	○	○	○	○
I can hear electricity humming in the walls	○	○	○	○
I notice the flickering of a desktop computer even when it is working properly	○	○	○	○
I would be able to notice a tiny change (e.g. 1 degree) in the temperature of the weather	○	○	○	○
I would be able to feel a one millimetre cut in my skin	○	○	○	○
I would be able to tell the weight difference between two different coin sizes on the palm of my hand, if my eyes were closed	○	○	○	○
I *couldn't* distinguish a familiar person and stranger by their smell	○	○	○	○
I *couldn't* detect if bread is stale purely by its smell	○	○	○	○
I would be able to detect the sound of a vacuum cleaner from any room in a two-storey building	○	○	○	○
I would be able to feel the elastic holding up my socks if I stop and thought about it	○	○	○	○

Continued…

	Strongly Agree	Agree	Disagree	Strongly Disagree
I would be able to taste the difference between apparently identical pieces of candy	○	○	○	○
I notice the weight and pressure of a hat on my head	○	○	○	○
I would feel if a single hair touched the back of my hand	○	○	○	○
If I was walking along, I would be able to feel a passing truck's vibrations even if my eyes were closed	○	○	○	○
I would be able to smell the smallest gas leak from anywhere in the house	○	○	○	○
I *wouldn't* notice if someone changed their perfume, by smell alone	○	○	○	○
I can't go out in bright sunlight without sunglasses	○	○	○	○
I would be able to feel a change in temperature of a cup of coffee after it had sat for one minute	○	○	○	○
I would be the first to hear if there was a fly in the room	○	○	○	○
If I look at a pile of blue sweaters in a shop that are meant to be identical, I would be able to see differences between them	○	○	○	○
I would be able to smell the difference between most men and women	○	○	○	○
I would be able to hear each note in a chord even if there were 10 notes	○	○	○	○
I close curtains to avoid bright lights	○	○	○	○
I would be able to distinguish between two brands of coffee by their smell, even with my eyes closed	○	○	○	○
I can see dust particles in the air in most environments	○	○	○	○
I *wouldn't* be able to taste the difference between two brands of tomato sauce if they had different concentrations of salt	○	○	○	○
I would be able to smell the smallest amount of burning from anywhere in the house	○	○	○	○
If my mobile phone was vibrating in my pocket I would be quick to sense it	○	○	○	○
I *wouldn't* detect a new smell in my house instantly before anyone else	○	○	○	○

Appendix 43 – Difficulties in Emotion Regulation Scale – 18 Item

Please select the response that is most true for you:

	Almost never	Sometimes	About half the time	Most of the Time	Almost always
I pay attention to how I feel	○	○	○	○	○
I have no idea how I am feeling	○	○	○	○	○
I have difficulty making sense out of my feelings	○	○	○	○	○
I am attentive to my feelings	○	○	○	○	○
I am confused about how I feel	○	○	○	○	○
When I am upset, I acknowledge my emotions	○	○	○	○	○
When I am upset, I become embarrassed for feeling that way	○	○	○	○	○
When I am upset, I have difficulty getting work done	○	○	○	○	○
When I am upset, I become out of control	○	○	○	○	○
When I am upset, I believe that I will remain that way for a long time	○	○	○	○	○
When I am upset, I believe that I'll end up feeling very depressed	○	○	○	○	○
When I am upset, I have difficulty focusing on other things	○	○	○	○	○
When I am upset, I feel ashamed with myself for feeling that way	○	○	○	○	○
When I am upset, I feel guilty for feeling that way	○	○	○	○	○
When I am upset, I have difficulty concentrating	○	○	○	○	○
When I am upset, I have difficulty controlling my behaviours	○	○	○	○	○
When I am upset, I believe that wallowing in it is all I can do	○	○	○	○	○
When I am upset, I lose control over my behaviours	○	○	○	○	○

Appendix 44 – Compulsive Personality Assessment Scale

Please respond to the following questions using the scale below:

	0 - Absent	1 - Mildly	2 - Moderately	3 - Severely	4 - Very severely
Are you preoccupied with details, rules, lists, order, organisation or schedules to the extent that the major aim of the activity is lost?	○	○	○	○	○
Would you describe yourself as a perfectionist who struggles with completing the task at hand?	○	○	○	○	○
Are you excessively devoted to work to the exclusion of leisure activities and friendships?	○	○	○	○	○
Would you describe yourself as over-conscientious and inflexible about matters of morality, ethics or values?	○	○	○	○	○
Are you unable to discard worn-out or worthless objects even when they have no sentimental value?	○	○	○	○	○
Are you reluctant to delegate tasks or to work with others unless they submit to exactly your way of doing things?	○	○	○	○	○
Do you see money as something to be hoarded for future catastrophes?	○	○	○	○	○
Do you think you are rigid or stubborn?	○	○	○	○	○

Appendix 45 – Barrat Impulsivity Scale – 15 Item

Please complete the below:

	Rarely/never	Occasionally	Often	Almost always
1. I act on impulse	○	○	○	○
2. I act on the spur of the moment	○	○	○	○
3. I do things without thinking	○	○	○	○
4. I say things without thinking	○	○	○	○
5. I buy things on impulse	○	○	○	○
6. I plan for job security	○	○	○	○
7. I plan for the future	○	○	○	○
8. I save regularly	○	○	○	○
9. I plan tasks carefully	○	○	○	○
10. I am a careful thinker	○	○	○	○
11. I am restless at lectures or talks	○	○	○	○
12. I squirm at plays or lectures	○	○	○	○
13. I concentrate easily	○	○	○	○
14. I don't pay attention	○	○	○	○
15. Easily bored solving thought problems	○	○	○	○

Appendix 46 – Generalised Anxiety Disorder Assessment – 7 Item

Over the last two weeks, how often have you been bothered by the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Feeling nervous, anxious, or on edge	○	○	○	○
Not being able to stop or control worrying	○	○	○	○
Worrying too much about different things	○	○	○	○
Trouble relaxing	○	○	○	○
Being so restless that it is hard to sit still	○	○	○	○
Becoming easily annoyed or irritable	○	○	○	○
Feeling afraid, as if something awful might happen	○	○	○	○

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- ○ Not difficult at all
- ○ Somewhat difficult
- ○ Very difficult
- ○ Extremely difficult

Appendix 47 – Autism Quotient – Attention Switching Subscale

Below are a list of statements. Please read each statement very carefully and rate how strongly you agree or disagree with it by circling your answer.

	Definitely agree (1)	Slightly agree (2)	Slightly disagree (3)	Definitely disagree (4)
I prefer to do things the same way over and over again	○	○	○	○
I frequently get so strongly absorbed in one thing that I lose sight of other things	○	○	○	○
In a social group, I can easily keep track of several different people's conversations	○	○	○	○
I tend to have very strong interests, which I get upset about if I can't pursue	○	○	○	○
It does not upset me if my daily routine is disturbed	○	○	○	○
I find it easy to do more than one thing at once	○	○	○	○
I enjoy doing things spontaneously	○	○	○	○
If there is an interruption, I can switch back to what I was doing very quickly	○	○	○	○
I like to carefully plan any activities I participate in	○	○	○	○
New situations make me anxious	○	○	○	○

Appendix 48 – Frost Multidimensional Perfectionism Scale

Instructions: Please answer the following questions in relation to how much they apply to you. Do not spend too much time on any one question.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. My parents set very high standards for me	○	○	○	○	○
2. Organization is very important to me	○	○	○	○	○
3. As a child, I was punished for doing things less than perfect	○	○	○	○	○
4. If I do not set the highest standards for myself, I am likely to end up a second-rate person	○	○	○	○	○
5. My parents never tried to understand my mistakes	○	○	○	○	○
6. It is important to me that I am thoroughly competent in everything I do	○	○	○	○	○
7. I am a neat person	○	○	○	○	○
8. I try to be an organized person	○	○	○	○	○
9. If I fail at work/school, I am a failure as a person	○	○	○	○	○
10. I should be upset if I make a mistake	○	○	○	○	○
11. My parents wanted me to do the best at everything	○	○	○	○	○
12. I set higher goals than most people	○	○	○	○	○
13. If someone does a task at work/school better than I, then I feel like I failed the whole task	○	○	○	○	○
14. If I fail partly, it is as bad as being a complete failure	○	○	○	○	○
15. Only outstanding performance is good enough in my family	○	○	○	○	○

Continued…

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
16. I am very good at focusing my efforts on attaining a goal	○	○	○	○	○
16.1. Please select Agree	○	○	○	○	○
17. Even when I do something very carefully, I often feel that it is not quite right	○	○	○	○	○
18. I hate being less than the best at things	○	○	○	○	○
19. I have extremely high goals	○	○	○	○	○
20. My parents have expected excellence from me	○	○	○	○	○
21. People will probably think less of me if I make a mistake	○	○	○	○	○
22. I never felt like I could meet my parents' expectations	○	○	○	○	○
23. If I do not as well as other people, it means I am an inferior human being	○	○	○	○	○
24. Other people seem to accept lower standards than I do	○	○	○	○	○
25. If I do not do well all the time, people will not respect me	○	○	○	○	○
26. My parents have always had higher expectations for my future than I have	○	○	○	○	○
27. I try to be a neat person	○	○	○	○	○
28. I usually have doubts about the simple everyday things I do	○	○	○	○	○
29. Neatness is very important to me	○	○	○	○	○
30. I expect higher performance in my daily tasks than most people	○	○	○	○	○
31. I am an organized person	○	○	○	○	○
32. I tend to get behind in my work because I repeat things over and over	○	○	○	○	○
33. It takes me a long time to do something "right"	○	○	○	○	○
34. The fewer mistakes I make, the more people will like me	○	○	○	○	○
35. I never felt like I could meet my parents' standards	○	○	○	○	○

Appendix 49 - Frost Multidimensional Perfectionism Scale – Brief Version

Please answer the following questions in relation to how much they apply to you. Do not spend too much time on any one question.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. If I fail at work/school, I am a failure as a person	○	○	○	○	○
2. I set higher goals for myself than most people	○	○	○	○	○
3. If someone does a task at work/school better than me, then I feel like I have failed at the whole task	○	○	○	○	○
4. I have extremely high goals	○	○	○	○	○
5. Other people seem to accept lower standards from themselves than I do	○	○	○	○	○
6. If I do not do well all the time, people will not respect me	○	○	○	○	○
7. I expect higher performance in my daily tasks than most people	○	○	○	○	○
8. The fewer mistakes I make, the more people will like me	○	○	○	○	○

OCD Participants Interview Schedule

Appendix 50 – Study 5 OCD Participants Interview Schedule

15. Interview introduction
    a. Introduction to interview topic
    b. Brief explanation of terms
    c. Emphasise confidentiality and right to withdraw

"Thank you for agreeing to take part in this study. This study aims to explore what it is like to eat as an adult with obsessive-compulsive disorder. Eating is a fundamental part of all our daily lives and we all have different experiences when it comes to eating. Some of us avoid certain foods, some of us engage in dieting or eat when we feel stressed, while others might not eat at all. Many things can affect what we eat; for example, aversions to certain smells or textures, our mood, or thoughts about bodyweight and health. Today I want to I want to learn more about your experiences with eating. There are no right or wrong answers; everyone's experience with eating is unique, so please speak freely and do mention anything that comes to mind, even if it does not feel relevant.

The interview will take around 45-60 minutes, although it depends on how much you have to say. Everything you tell me is confidential and anonymous. To ensure you remain anonymous, I will assign you a participant number or pseudonym.

The interview will be audio recorded and I will only use the recording to accurately type up our conversation. After I have typed up our interview, the audio recording will be destroyed. If you would like me to stop the recording at any time, please do let me know."

- Start recording -

16. OCD symptoms
    a. Tell me a bit about your OCD symptoms
        i. Symptom types (e.g., washing, harm avoidance etc.)
    b. When did your symptoms first start?

    NB: Demographics obtained via questionnaire from part 1

17. Giving examples, can you describe what you feel to be the main challenges your OCD has on your daily life?

18. How would you describe your diet?

    Prompts:
    For example, would you describe your diet as healthy or balanced?

19. Can you explain the type foods you like and dislikes?

    Prompts
    - *What is it that you like or dislike about these foods?*

20. Can you tell me a bit about your eating habits as a child?

21. Can you tell me a bit about your eating habits now (whether picky eating, time of day etc)?

    Prompts:
    - *For example, picky/fussy*
    - *Can you tell me about your eating patterns (e.g., time of the day)*

22. Have you had any challenges with your eating behaviours?

    Prompts:
    Appetite/food responsivity
    Over-eating/bingeing or under-eating/restrictive eating
    Compensatory behaviours (e.g., exercise, purging)
    Food avoidance (food neophobia or selective eating)
    Planning/preparing meals

23. Can you outline whether you think your OCD has had any impact on your eating habits in daily life? (prompts food choices, food preparation)

    Prompts:
    How does having OCD effect your food choices?
    What impact does OCD have on preparing foods and mealtimes?
    Can you describe any rituals or compulsions you have that are related to eating, your food choices or meal preparation?

24. How does your OCD impact on eating out of home? (work, socialising)

25. Following OCD medication, can you describe, if any, resulting changes in your eating habits and mealtimes?

26. During the pandemic did you perceive any noticeable changes in your eating patterns?

    Prompt:
    Can you explain whether these changes were related to your OCD symptoms?

27. Has a healthcare professional ever asked you about your eating behaviours? For example, a psychiatrist or therapist (if yes), what prompted them to ask you?

28. Have you ever received support for your eating behaviours?

29. What would you like healthcare professionals to know about eating as an adult with OCD?

30. What advice would you give to anyone who may struggle with both OCD and eating challenges?

31. Is there anything else related to your eating behaviours that we have not covered in the interview?

Healthcare Professionals Survey

Appendix 51 – Study 6 Healthcare Professionals Survey

Demographics and Clinical Background

Please enter memorable 6-digit anonymity code using letters and numbers Note: this code will be needed to remove your data should you wish to withdraw

_____

What is your profession?

- ☐ Psychiatrist
- ☐ Psychologist
- ☐ Therapist (e.g., CBT, ERP or other psychological interventions)
- ☐ Nurse/mental health nurse
- ☐ Occupational therapist
- ☐ Pharmacist
- ☐ Assistant psychologist
- ☐ Other - please describe _____

Which country are you currently practicing in?

▼ Afghanistan ... Zimbabwe

Do you practice in the public or private health sector?

- [ ] Public health service (e.g., the NHS)
- [ ] Private health sector
- [ ] Both public health and private sector
- [ ] Other, please describe _____

How many years have you worked with OCD patients?

▼ 1 ... 10+

Have you worked with eating disorder patients during your career?

- ○ Yes
- ○ No
- ○ Unsure

Which diagnostic guidelines do you follow for OCD?

- [ ] DSM-5-TR / The Diagnostic and Statistical Manual of Mental Disorders - 5th Edition Text Revision
- [ ] ICD-11 / The International Classification of Diseases - 11th Edition
- [ ] Other - please describe _____

Presentation of Eating Disturbances in OCD

The next questions will ask about your experiences of eating disturbances in OCD. 'Eating disturbances' refer to a variety of atypical eating behaviours which range between **non-clinical** to **clinically severe**:

- **Non-clinical eating disturbances:** atypical eating behaviours which do not necessarily require clinical intervention. Examples include selective eating, (e.g., picky or fussy eating), food neophobia (rejection of unfamiliar foods), or subthreshold/less severe eating disorder behaviours such as dieting or bingeing.

- **Clinical eating disturbances:** severe, pathological eating behaviours which warrant an eating disorder diagnosis and/or clinical intervention. This may include anorexia nervosa, bulimia nervosa, avoidant-restrictive intake disorder, binge-eating disorder or other eating disorders.

Please consider both non-clinical and clinical eating disturbances in your answers, unless specified.

Do you routinely ask OCD patients about eating disturbances?

- ○ Yes
- ○ No
- ○ Sometimes

How frequently have you observed eating disturbances in adults with OCD?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ Frequently
- ○ Most/all of the time
- ○ Not applicable or have not worked with adults

How frequently have you observed eating disturbances in children and adolescents with OCD?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ Frequently
- ○ Most/all of the time
- ○ Not applicable or have not worked with children/adolescents

Which eating disorders have you observed in OCD patients? Please select all that apply

- ☐ Anorexia nervosa
- ☐ Bulimia nervosa
- ☐ Binge-eating disorder
- ☐ Avoidant-restrictive food intake disorder (ARFID)
- ☐ Eating disorders not otherwise specified (EDNOS)
- ☐ Other - please describe _____

Which non-clinical eating behaviours have you observed in OCD patients? Please select all that apply

Note: these behaviours might be similar to what is seen in eating disorders, but are less severe and do not warrant a clinical eating disorder diagnosis

- [ ] Selective eating (i.e., food fussiness or picky eating)
- [ ] Food neophobia (i.e., the rejection of unfamiliar foods or cuisines)
- [ ] Dieting
- [ ] Bingeing on foods
- [ ] Purging (e.g., vomiting or laxative use)
- [ ] Compensatory exercise to manage/lose weight
- [ ] Focus on 'pure and healthy' food
- [ ] Emotional overeating
- [ ] Emotional undereating
- [ ] Increased responsivity to food (i.e., urge to eat in the presence of food without necessarily feeling hungry)
- [ ] Slowness when eating
- [ ] Increased hunger
- [ ] Increased satiety responsivity (i.e., feeling full when only consuming a small portion of food)
- [ ] Other - please describe _____

In your opinion, which OCD symptoms are associated with eating disturbances? Please select all that apply

- [ ] Eating disturbances are not related to specific OCD symptoms
- [ ] Harm-related obsessions and compulsions
- [ ] Sexual
- [ ] Religious
- [ ] Ordering/symmetry/counting
- [ ] Contamination
- [ ] Hoarding
- [ ] Somatic obsessions and compulsions
- [ ] Other - please describe _____

Do eating behaviours remain stable throughout the course of OCD?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ Frequently
- ○ Most/all the time

Optional: please can you explain your answer above?

_____

In your experience, which symptoms occur first?

- ☐ OCD symptoms precede eating disturbances
- ☐ Eating disturbances precede OCD symptoms
- ☐ OCD and eating disturbances start at the same time
- ☐ Other - please describe _____

Why do you think eating disturbances occur in OCD? Please select all that apply

- ☐ Perfectionistic traits
- ☐ Difficulties in emotion regulation
- ☐ Rigidity/need for routine
- ☐ Sensory sensitivity (i.e., over-responsivity or under-responsivity to sensory stimuli)
- ☐ Overlaps in OCD and eating disorder symptomology (e.g., obsessing/intrusive thoughts/compulsive behaviours)
- ☐ Genetics (e.g., heritable traits, specific genes)
- ☐ Cultural influences
- ☐ Familial influence (i.e., family environment/upbringing)
- ☐ Prescribed medications
- ☐ Other - please describe _____

Managing Eating Disorders in OCD

This section refers to eating disorders only (e.g., anorexia nervosa, bulimia nervosa, avoidant-restrictive intake disorder, binge-eating disorder or other eating disorders).

If a person presented to your service with OCD and an eating disorder, how would this be managed?

- ☐ Continue with OCD treatment and monitor eating disorder symptoms
- ☐ Referral to eating disorder specialist
- ☐ Other - please describe _____

Are there specific clinical resources for someone who presents with OCD and an eating disorder at your service?

- ○ Yes
- ○ No
- ○ Unsure

If you answered yes to the above question, please briefly describe which resources are available

_____

_____

_____

_____

_____

If a patient with OCD presents with an eating disorder, are there comorbidities you believe should be enquired about?

- ○ Yes
- ○ No
- ○ Unsure

If you answered yes, which comorbidities do you think are important to ask about?

_____

_____

_____

_____

_____

In the case of co-occurring OCD and eating disorders, which service do you think is most appropriate for treatment?

- ○ OCD service
- ○ Eating disorder service
- ○ Other - please describe _____

Does your answer to the above question depend on the type of eating disorder (e.g., anorexia nervosa or bulimia nervosa)?

- ○ Yes
- ○ No
- ○ Unsure

Optional: please explain your answer to the above question

_____

_____

_____

_____

_____

Do you have any other comments or observations about eating disturbances in OCD that not have been covered by the questions? *This includes both non-clinical eating behaviours and eating disorders*

_____

You have now reached the end of the survey. Thank you for taking the time to complete the survey.

Healthcare Professionals Interview Schedule

Appendix 52 – Study 6 Healthcare Professionals Interview Schedule

Interviewer to introduce the interview topic:

The aim of the interview is to understand your experience with eating disturbances in those who have OCD. Past research has focused on eating in those who have OCD, but it's also important to understand how this issues present and are managed from an objective clinical perspective. During the interview, we would like you to talk about both eating disorders and general eating patterns, e.g., overeating, undereating, weight etc. There are no right or wrong answers, so please speak freely and mention anything which comes to mind. I will keep my talking to a minimum to not disrupt the transcription. If, for any reason, you would like to pause or stop the interview, please let me know. If you are ready to proceed, I will start the audio recording.

< Audio recording to begin >

Demographic details

1) Educational background
2) Clinical profession
3) Length of time worked with OCD patients (in years)
4) Experience with OCD patients on the NHS, privately or both?
5) Past experience with eating disorders? yes/no

Interview schedule

1. Can you tell me about any eating disturbances that you have encountered within the OCD population during your clinical career?

    Probes:
    • What types of eating disturbances have you observed?
    • How common are eating disorders in the OCD population?
    • How common are non-clinical eating behaviours in the OCD population?
    • Generally, when do eating disturbances emerge in this population (i.e., before/after/ at the same time as OCD symptoms)?
    • How do eating disturbances/behaviours change throughout the course of illness?
    • Can you describe any differences between eating disturbances in adults and children/adolescents with OCD?

2. Emerging evidence has highlighted that OCD might also be associated with avoidant-restrictive food avoidance. How familiar are you with ARFID?

    Probes
    a. Can you tell me about any ARFID symptoms that you have come across in the OCD population?
    b. How common are ARFID symptoms in OCD?

3. What impact do eating disturbances have on OCD patients?

    Probes

a. What impact do eating disturbances have on weight?
b. Can you describe the effect of eating disturbances on day-to-day functioning?
c. What effect do eating disturbances have on a patient's ability to manage OCD symptoms?

4. If an OCD patient presented with eating disorder symptoms, how would this be addressed?

Probes
a. Which service would be most appropriate to treat someone with comorbid OCD and eating disorder?
    i. Can you tell me about what would inform this decision?
b. Would you consider OCD and eating disorder symptoms to overlap, or are they mutually exclusive/independent of one another?
c. What would be the challenges associated with treating eating disturbances in this group?
d. What resources are available for a person with OCD who also has eating concerns?

5. In your opinion why do you think eating disturbances occur in the OCD population?

Probes
a. Can you explain whether you think specific OCD symptoms (e.g., contamination or ordering) are related eating disturbances?
    i. Which OCD symptoms are related to eating disturbances?
b. Can you tell me about the factors which you think might underlie eating disturbances in this population? (e.g., sensory sensitivity, emotion regulation, personality traits, genetics etc.)

6. Is there anything else you would like to add that we have not covered?

Free text answers (Chapter 8)

Appendix 53 – Free Text Responses from Healthcare Professionals Survey (Study 6, Chapter 8)

Survey question: Do eating behaviours remain stable throughout the course of OCD?

Participant responses:

1. Only when the eating is a compulsion in itself and I haven't seen that often in my experience.
2. If they are clearly linked to the OCD (more often food restriction) they might get better as the OCD improves. if they are not, very often the ED worsens as OCD improves
3. ARFID, selectivity and food neophobia use to be stable. Rising or reducing appetite use to resolve with treatment.
4. I believe the course of eating disorders are the same (i.e. not stable; becoming less pronounced/impactful over time) whether in the context of OCD or not.
5. When disordered eating is a consequence of the OCD, its intensity fluctuates according to the OCD symptoms' intensity. Sometimes, it resolves once OCD symptoms starts to subside if there is no other risk factors/psychopathology perpetuate the eating disorder symptoms.
6. I have seen patients with OCD throughout my career but not in high enough numbers to draw a conclusion about this
7. Improve when relatively well
8. For most people I have supported their non-clinical eating behaviours have been stable throughout. However, for people where they have shown clinical eating disorders these have often fluctuated.
9. I have seen a fluctuating pattern of eating behaviours
10. Sometimes as the rigid rules with food start to reduce and flexibility with food begins this can lead to more flexibility with OCD compulsions.

Survey Question: If a patient with OCD presents with an eating disorder, are there comorbidities you believe should be enquired about? If yes, which comorbidities do you think are important to ask about?

Participant responses:

1. In an assessment I would think about all comorbidities but may look particularly at ASD and Sensory Processing Disorder.
2. ASD, other OCRDs, addiction type behavior including behavioral addictions
3. Depression, personality disorder, other OCRDs
4. major depressive disorder, OCPD
5. Personality disorder, ASD, other OCRDs, ADHD, anxiety disorders, tic disorders, mood disorders, psychotic disorders
6. ASD, any eating disorders, EUPD, BDD
7. anxiety and mood
8. Intellectual and/or developmental disability (e.g. autism), genetic conditions (e.g. Prader-Willi syndrome), possibility of pregnancy, any physical/medical concerns, some clinicians may question PANDAS (e.g. Strep infection)

9. Depression
10. If bulimia nervosa: other impulse control disorders. If ARFID: autism spectrum disorder or other obsessive-compulsive related disorders. Depression always should be evaluated
11. Nutritional deficiencies, weight change, nutritional status
12. Anxiety, depression
13. What's most important is to conduct a comprehensive diagnostic assessment to clearly diagnose or exclude obsessive-compulsive disorder.
14. OCPD; non-suicidal self-injury
15. Personality disorder, depression, trauma
16. Anankastic personality disorder, Autism Spectrum Disorder, Psychosis which might be hidden behind the OCD symptoms.
17. Other symptoms of Autism
18. Autism
19. I think they would need to be investigated but i'm not sure about the specifics
20. Heart disorder, genetics, autism eupd psychological impact as well as pood health isolation.
21. Autism
22. EUPD
23. EUPD
24. Autism, sensory integration difficulties, history of trauma
25. Autism, anxiety
26. OCPD
27. I think it's important to ask about trauma, EUPD.
28. Anxiety, in relation to perfectionism and if appropriate neurodiversity.
29. Substance use

Survey Question: In the case of co-occurring OCD and eating disorders, which service do you think is most appropriate for treatment?

Participant responses:

1. Depends on patient's priority
2. depends on primary problem in terms of functional impact and risks
3. Depends on the severity of each condition
4. Depends on the case. There are cases in which eating disorder services can be helpful in managing the physical symptoms and refeeding, which OCD services do not have the necessary expertise about. However, in most cases, initiating treatment at the OCD services would be the first starting point.
5. Depends on which disorder is primary and causes more impairment
6. depends, but joint work or sequential work is best in my opinion
7. Depends on initial formulation and how primary needs are conceptualised. For someone with IDD, it maybe an IDD service is better suited.
8. mostly depends on the severity
9. If anorexia nervosa or if the eating disorder is more severe - eating disorder service
10. Start with the symptoms that are primary (ie most severe / impactful)
11. Depends on primary presentation and risk
12. Need to work together

13. It varies depending on the severity of the ED and whether the e.g. food restriction linked to OCD threat appraisals or body image etc.
14. Not sure I know the answer to this and again would assess case by case
15. Again depends on cognitive functioning
16. Ideally joint working
17. Depends on the formulation and which is causing the biggest impact