Background

July 19th, 2021 saw the lifting of legal enforcements concerning the majority of United Kingdom restrictions mandated by the Government during the height of the COVID-19 pandemic (BBC, 2021). Although unpredictable changes in levels of restriction and control are still expected for the foreseeable future (The Guardian, A & B, 2021), the UK public is gradually being incentivized to return to the work-place, based on a need to reinstate vital public services such as health and education, support the UK economy, and restore public mental health and psychosocial wellbeing (Chadha, J., 2021). Nevertheless, the ease with which the public adjust to more normal behavior patterns, such as sharing closed spaces with others on public transport or in the office environment, remains to be seen.

Converging evidence suggests that the COVID-19 pandemic has had a major negative impact on overall public mental wellbeing (Knolle et al., 2021). Population surveys have, for example, identified moderate rates of adjustment reaction to the onset of the pandemic, ranging from 7 to 14% (Tian et al., 2020; McGinty et al., 2020; Liu et al., 2020). The effect of the easing of restrictions on mental health and wellbeing however has not been well studied. Lack of clarity about the safety regulations has been cited as causing difficulties for the public, in terms of adherence to the rules in the early stages of the pandemic and latterly in terms of adjusting to their relaxation (The Guardian, B, 2021).

Our recently published study (Fineberg et al., 2021) conducted between July and November 2020, as the first wave of easing of restrictions was implemented in the UK, is the only published study to date investigating mental health difficulties experienced by the public in response to the easing of lockdown restrictions. We surveyed a large adult UK population-based sample online, timed to coincide with changes in social-distancing rules (July-Sep 2020). We obtained cross-sectional measures of the frequency and severity of adjustment difficulties and associations with specific obsessive-compulsive (OC) traits and symptoms, finding that one-in-four reported significant adjustment difficulties.

On mediation analysis, we showed that both OC symptoms (measured using the Obsessive-Compulsive Inventory Revised; OCI-R (Foa et al., 2002)) and OC personality traits (measured using the Compulsive Personality Assessment Scale; CPAS (Fineberg et al., 2007)) acted as indirect predictor variables of adjustment, though in different ways: OC symptoms

significantly predicted adjustment acting via depressive, anxious and stress symptoms (measured through the Depressive, Anxiety, Stress Scale 21 (DASS-21) (Lovibond & Lovibond, 1995) and via Covid-related anxiety (Covid Anxiety Scale (Chandu & Pachava, 2020)), whereas OC personality traits significantly predicted adjustment via depressive, anxious and stress symptoms only.

'Poor-adjusters' also showed evidence of greater cognitive inflexibility on the intra-extra-dimensional set-shift task (Intra-Extra Dimensional Set Shift (IED) task: Robbins et al., 1998). Moreover, higher than expected rates of OC symptomatology were found in study participants with no prior history of mental disorder. Taken together, these findings expose mental health inequalities among the public in terms of their ability to flexibly adapt and return to a more normal lifestyle. While many members of the wider public are likely to be affected, those whose psychiatric conditions (OC related) have been exacerbated by the pandemic and show increased levels of rigidity, will struggle more than most as pandemic restrictions ease.

Several factors indicate that individuals with OC personality traits (cautious, rule-bound, habitual, rigid), representing around 6% of the general population (Marincowitz et al., 2021; Burkauskas & Fineberg, 2020), might be expected to find adjustment particularly difficult during this transition phase, especially considering the ongoing uncertainty about the risk of infection at an individual level. People with obsessive compulsive personality disorder (OCPD) are defined by rigid and stubborn behaviours and show cognitive inflexibility on objective neurocognitive testing (Fineberg et al., 2015). Indeed, the disorder is characterized by a pervasive preoccupation with orderliness, perfectionism and control of a degree that impairs psychosocial functioning. As the official rules are relaxed, and members of the public start to behave in more idiosyncratic ways, we might expect people with OCPD, who are likely to have followed the rules conscientiously during the lockdown, would experience stress-related symptoms. Indeed, based on the clinical experience of working in a UK NHS service treating patients with OCPD, some of the authors (NF, LP) have come across several such patients describing greater difficulty leaving home now the rules have been relaxed, owing to various factors including disagreement with and rejection of the decision to change the rules and uncertainty about how they and others should behave.

Diagnostic efficiency statistics (sensitivity, specificity, positive and negative predictive power) suggest that four of the eight available DSM-5 OCPD traits, comprising perfectionism,

reluctance to delegate, preoccupation with details and rigidity may represent the most reliable indicators of the disorder, though some debate remains (Haigler & Widiger, 2001; De Fruyt et al., 2006; Fineberg et al 2007). As OCPD as a construct is judged to be relatively stable across the lifespan (Fineberg et al., 2007), these traits carry the potential for predictive value, compared to state makers such as OC symptoms. Considering our prior work, we hypothesized that these core OCPD traits would be disproportionately associated with difficulties flexibly re-adjusting.

Aims and Objectives

By identifying the specific OC traits most associated with adjustment difficulties among adult members of the general public, we aimed to establish a platform for the development of new screening and interventional strategies, as a step toward restoring public mental health and wellbeing.

Methods

This secondary analysis interrogates data collected in our published study conducted during the summer of 2020 (Fineberg et al., 2021). The protocol and study objectives were pre-registered on July 15, 2020 (Open Science Framework; https://doi.org/10.17605/OSF.IO/GS8J2). Ethics approval was granted from the University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority (Ethics number: aLMS/SF/UH/04219).

For full methodological details, please see Fineberg et al (2021). In sum, an online survey including questionnaires about lifestyle, Covid-19 safety behaviors and OC traits was completed by a broad spectrum of the general population aged 18 years or over, recruited via advertisement on the Internet. The study ran from 16/07/2020 to 13/10/2020, during which period pandemic restrictions were partially eased; schools, universities and high street shops re-opened and people were allowed to travel and mix socially, albeit with some limitations. Diverse groups were targeted including those living with anxiety and OCD, to facilitate appropriate representation of minority and neglected groups disproportionately affected by the pandemic. No reward was offered to participants.

Measured variables

The survey gathered demographic and clinical details: age, gender, racial-ethnic group, education level, occupation, living status, whether they (or family members) had contracted Covid-19, whether someone close had died of COVID-related illness, the extent to which the participants followed government guidelines for COVID-19.

We also obtained a subjective measure of the extent to which the person was experiencing adjustment difficulties to the release of lockdown and lifting of restrictions, using the Post-Pandemic Adjustment Questionnaire - a series of seven likert-type statements (see Table 1). The Post-Pandemic Adjustment Questionnaire is a 7-item self-rated tool developed by our group specifically for this study as no other template for this purpose exists. The scale is first described in the initial report of this study (Fineberg et al., 2021; table 1), where it was shown to significantly correlate with a validated measure of depressive/anxious/stress symptoms (DASS-21), as well as OCD symptoms (OCI-R), OCPD traits (CPAS) and a past history or family history of mental disorder. The scale is currently undergoing further evaluation by our group, including in a replication study (Open Science Framework registration: https://doi.org/10.17605/OSF.IO/XD5WZ).

OCPD traits were assessed with the self-rated version of the CPAS, which is an 8-item self-rated (or observer-rated) instrument measuring the severity of individual traits of DSM-5 OCPD. The CPAS has been found to differentiate individuals with OCPD both in a university student sample (Fineberg et al., 2015), where it was validated against an objective measure of cognitive inflexibility (ID-ED task), and among various clinical groups of patients (Gecaite-Stonciene et al., 2020; Gadelkarim et al., 2019).

Table 1 about here

Statistical Analysis

Statistical analyses were conducted using IBM SPSS Statistics for Windows, version 27.0 (IBM Corp., Armonk, N.Y., USA). The means and frequencies were calculated for socio-demographic information, COVID-19 related data, CPAS, adjustment. Expression of N (%) and mean ± SD were used for qualitative and quantitative data respectively. For all variables, we performed normality tests, including skewness, kurtosis, and one-sample Kolmogorov-Smirnov tests, and found no violations of the normal distribution.

As per Fineberg et al (2021), poor-adjusters to the COVID-19 pandemic restrictions (n=124) were defined as those who *agreed* or *completely agreed* with the Post-Pandemic Adjustment Questionnaire statement *"I am having great difficulty adjusting to the easing of the Covid-19 pandemic restrictions"*, while good-adjusters (n=219) were identified as those who *disagreed* or *completely disagreed* with the same item. Ninety-five individuals endorsed 'neither agree nor disagree' and were designated 'indeterminate-responders' and were excluded from the comparative analyses – see Table 2 below).

First, using two-tailed Student's t-test for continuous variables and Fisher's $\chi 2$ test for categorical and nominal variables, we compared poor adjusters vs. good adjusters on the measured socio-demographic characteristics and total scores on the CPAS. This comparative analysis was conducted in order to investigate possible significant differences between the two groups and identify those variables that might play a role in re-adjustment.

Next, Pearson correlation analysis was used to examine associations between individual CPAS items with all the different items on the Post-Pandemic Adjustment Questionnaire. All variables found to be statistically significant ($p < .001$) at this stage of analysis were then included in a series of multiple regression analyses, performed to determine if the sum of the specific CPAS items that were previously found to show a significant correlation in the Pearson correlational analysis (independent variables or predictors), predicted adjustment problems (dependent variables or outcomes) more precisely compared to the total score of the scale. We examined scatterplots of residuals to check the assumptions of the regression analysis: normality, linearity, and homoscedasticity. The variance inflation factor (all <1.2) and tolerance statistic indicated no problem with multicollinearity.

Results

Characteristics of the 438 participants are displayed in Table 2. The majority of the participants (n=325: 74%) were women; most were either employed (n=338; 77.2%) or studying (n=55; 12.6%). The mean age was 37 years (SD=14). Compared to good-adjusters, poor-adjusters were younger (p<.01), had a higher degree of adherence to the government rules (p<.001) and had higher CPAS total scores (p<.001).

Table 2 about here

Pearson correlation analyses showed that several CPAS items correlated significantly with the following specific items on the Post-Pandemic Adjustment Questionnaire: general difficulties in adjustment; avoidance; disinfecting behaviors (Pearson's *r*, all *p*'s < .001) (Table 3).

General difficulties adjusting correlated (Pearson's *r*, all *p's* <.001) with perfectionism, preoccupation with details, over-conscientiousness and need for control (CPAS items 2, 1, 4 and 5, respectively); social avoidance correlated with perfectionism and preoccupation with details (CPAS 1 and 2); disinfecting behaviors correlated with preoccupation with details and miserliness (CPAS items 2 and 7).

No significant correlation was found between any other CPAS items and any other measures on the Post-Pandemic Adjustment Questionnaire. No significant correlation emerged between adherence to government guidance and any CPAS items.

Table 3 about here

Multiple regression analyses (Table 4) showed how the models (adjusted β-weights and p-values) including only the scores of the specific CPAS items showing a significant correlation on the Pearson analysis (independent variables) explained a significant amount of the variance (R^2) and had a strong relationship (adjusted β-weights) with the adjustment problems. N.B. In running these regression models, we controlled for age, as the only sociodemographic factor statistically significantly differentiating between poor-adjusters and good adjusters in the initial categorical analysis, and therefore as another potential factor affecting adjustment.

Table 4 about here

Discussion

Our findings describe the impact of individual OC traits on specific aspects of post-lockdown adjustment. Our a priori hypothesis was validated in so far as three of the four core OCPD traits were identified as risk factors for impaired adjustment. Of these, perfectionism and preoccupation with details were the traits showing the strongest relationship with adjustment, as they each significantly correlated with more than one item on the Post-Pandemic Adjustment

Questionnaire. Perfectionism was associated with general difficulties in adjustment and avoidance, while preoccupation with details was related to avoidance and disinfecting behaviors. Individuals with perfectionism might be expected to show difficulty tolerating the relaxation of societal rules governing safety and continue to avoid social activities owing to the ongoing uncertainty and the perceived incompleteness and inconsistency of the information they have received about risks. In contrast, those with preoccupation with details, rules, lists and so on, possibly reflecting poor "central coherence" (Gadelkarim et al., 2019), might be expected to value more and therefore hold onto, previously reinforced rules around safety-behaviours, such as washing and disinfecting.

Other OC traits bearing a relationship with one aspect of adjustment included over-conscientiousness and need for control, which were also associated with general adjustment difficulties. Individuals with these traits might be expected to struggle as they feel a strong sense of duty to act well and thoroughly; and are sensitized to and unduly distressed by any inconsistency or inadequacy in the ways other people behave and over which, they are unable to exert personal control. Interestingly, however, whereas we might have expected those with conscientiousness or rule-bound traits to adhere more thoroughly to government guidance during the pandemic, our analysis did not confirm this relationship. Therefore, whereas adjustment was associated with rule-adherence across the whole study sample, adherence did not appear to explain the specific relationship between OCPD and adjustment. The absence of a relationship between OCPD and adherence to government guidance is to some extent a counterintuitive finding, as it might be expected that perfectionist, detail-focused traits would result in stricter adherence to statutory guidance, and thereby confer adaptive advantage in terms of greater protection against infection during the pandemic itself. Our findings raise the intriguing possibility that OCPD traits do not in fact confer such an advantage or an adaptive profile for adherence to government guidance and COVID-19 rules.

Intriguingly, miserliness, a somewhat controversial diagnostic criterion for OCPD (Fineberg et al., 2007), was significantly associated with the maintenance of disinfecting behaviors. Miserliness may represent an alternative and 'literal' behavioural marker of inflexible ways of thinking and behaving, and therefore may be easily recognized and endorsed by participants with rigid behavioural styles. However, unexpectedly, rigidity was not among those personality traits associated with adjustment problems. This was unexpected, given that we (Fineberg et al 2021) had previously found that poor adjustment was linked to rigidity as assessed using an

objective cognitive task (IDED task, Robbins at al., 1995). A failure in meta-cognition associated with lack of personal insight into being rigid or stubborn has been reported in people with OCPD (Oltmanns et al., 2005). Therefore, one possibility is that people may have had difficulty recognizing the trait of cognitive rigidity in themselves and underscored this item on the self-rated version of the CPAS. Our results suggest that in future studies, rigidity might be better assessed using either clinician-rated scales or objective cognitive tasks rather than self-assessment.

As around one quarter of the adult public are struggling to adjust (Fineberg et al., 2021), these findings are likely to have public health implications. Our findings suggest that personality traits play an important role in determining who will develop adjustment problems, regardless of the degree of prior adherence to the safety rules. Greater awareness of the difficulties that some sections of the public are experiencing in adjusting and the health inequalities underpinning these difficulties is important, considering the expectation that many sections of the public will have to return to in-person activities at some point (BDBF, 2021). These OCPD traits may therefore constitute a platform for the development of new screening and interventional strategies aimed at restoring public mental health and wellbeing as we recover from this pandemic. Moreover, as lifelong traits, they are likely to carry predictive value for adjustment in the case of future similar critical life events.

By recognizing and identifying those individuals most at risk, public and occupational health policy may be adapted, and timely interventional strategies developed and adopted, e.g., psychoeducation, guided self-help, reasonable workplace adjustments such as graduated return, etc., before adjustment problems become chronic and entrenched. Employees routinely undergo psychological assessment to detect traits of relevance to occupational performance. As in-person working is re-established, employers could pay attention to the presence of these specific OCPD traits to identify those employees likely to find it harder to re-adjust to previous working habits, and who could therefore benefit from specific assistance and support. However, it should be pointed out that OCPD has to date received relatively little research attention and no evidence-based treatment exists. Therefore, this work also draws attention to the need for new investigation of interventional strategies for OCPD (Marincowitz etl., 2021).

Limitations

Admittedly, only a modest proportion of the variance in adjustment can be attributed to the OCPD traits – around 4-6%; however, this is contextualized by the fact that any variance can be explained using so few items to predict very specific single item adjustment outcomes. Indeed, while the amount of variance explained might on the face of it seem quite small, the regression values correspond to Cohen's d values of somewhere between 0.40 to 0.50. In considering the clinical importance of these effect sizes, it should be recognized that sometimes even small effects can have significant implications. It may be, for example, that such an effect accumulates with (or interacts with) other factors not yet tested. Moreover, it is thought likely that the overall tendency to adjust well or not will be multifactorial and consist of many small cognitive and behavioral 'nudges' (none necessarily large). This finding suggests that existing OCD-like traits represent one such 'nudge'. Replication of this finding in another study would be welcome.

Importantly, these traits are not likely to occur as a consequence of the Covid-19 pandemic, but instead represent relatively stable, pre-existing risk factors and thus may not be readily or immediately amenable to simple educational interventions in the opposite direction (e.g., by governments and advisors offering health advice).

We nevertheless believe that it could be useful and feasible to screen for these OCPD traits (though our study is not designed to address this point), as the CPAS scale consists only of 8 items and can be used as a self-rated instrument. For whom and in which contexts screening should take place, is a very interesting question that would need careful consideration and to be based on empirical evidence. For example, assessment for OCPD could possibly be readily incorporated into occupational health assessment for those struggling to return to work.

Another limitation of our cross-sectional design is that we are unable to confirm the direction of causality i.e., whether OCPD traits result in problems adjusting. Although OCPD as a construct is thought to be reasonably stable across adulthood, there is also evidence that specific traits may change over time (Nestadt et al., 2010). It is therefore possible that the stress of the pandemic and the current post-lockdown situation might have triggered or exacerbated OCPD traits, that only became evident on testing afterward.

Conclusion

Of the wide range of OCPD traits predicting problems adjusting post-pandemic, perfectionism and preoccupation with details showed the most robust correlations. These traits constitute a

platform for the development of new screening and interventional strategies aimed at restoring public mental health and wellbeing. Cognitive rigidity may be more reliably evaluated using an objective form of assessment.

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