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The Effect of a Dance/Movement Therapy Emotional Self-Regulation Program on Adolescents with Intellectual Disabilities in Hong Kong

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Title page

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We hereby declare that the authors have no relevant financial or non-financial interests to disclose and also that the authors have no competing interests to declare that are relevant to the content of this article.

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Abstract

This study aimed to investigate the impact of a dance/movement therapy (DMT) emotional self-regulation (ESR) program on adolescents with intellectual disabilities (ID) during the transition from school to post-school in Hong Kong. In response to the growing awareness of mental wellness in youth with special educational needs, research based on dance/movement therapy and self-determination theory was conducted. This mixed-methods study utilized a randomized controlled trial and focus groups. Fifty-one students and five school staff members from five special schools participated. Students were randomly assigned to intervention and control groups. Data were collected using the Strengths and Difficulties Questionnaire and analyzed with a T-test at pre-, post-intervention, and at a 14-week follow-up. Verbal data from focus groups were analyzed using thematic content analysis with NVivo, and non-verbal, art-based data were triangulated with verbatim transcriptions. Quantitative results showed significant improvement in the intervention group for all variables at the 14-week follow-up. Qualitative findings revealed processes related to

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Keywords: Dance/Movement Therapy, Emotional Self-Regulation, Self-Determination Theory, Adolescents, Intellectual Disabilities

Introduction

Mental wellness has become a critical global concern. In response, the World Health Organization (WHO) published the *Comprehensive Mental Health Action Plan 2013–2030* (WHO, 2021) to address the growing need for mental health care worldwide. According to the WHO (2020), more than 50% of adult mental illnesses begin during adolescence, yet many cases go undiagnosed and untreated.

Research suggests that young people with disabilities are at an increased risk for mental health issues compared to their non-disabled peers (Blackorby & Wagner, 1996; Costello & Bouras, 2006; Emerson, 2003; Wagner & Davis, 2006). Young-Southward et al. (2017) report that mental health and well-being challenges, including obesity and sexual issues, emerge during adulthood in adolescents with intellectual disabilities. Thus, early intervention is essential for addressing these issues during adolescence. Furthermore, Koslowski et al. (2016) conducted a systematic review of mental health interventions for individuals with mild and moderate intellectual disabilities, highlighting the lack of sufficient research to support effective interventions. This study aims to address this gap by focusing on

mental health and emotional regulation in children and adolescents with intellectual disabilities (ID).

Although there is no single definition of emotion, it can generally be described as the body's neurological response to external stimuli (Beauregard, 2007; Damasio, 2001; Dixon, 2012; Emanuel, 2004; Gross, 2013). Beauregard (2007) suggests that emotion is a biological response involving cognitive, physiological, and behavioral systems. Koole (2009) further defines emotional self-regulation (ESR) as the use of strategies to manage emotions. This study defines emotion as a multifaceted experience, involving bodily, neurological, cognitive, and physiological responses to events. Emotional regulation plays a critical role in mental well-being, helping individuals maintain psychological stability, focus, and social relationships (Gross & Muñoz, 1995).

This study is grounded in two theoretical frameworks: dance movement therapy (DMT) and self-determination theory (SDT). DMT utilizes dance and movement creatively to promote emotional, cognitive, physical, social, and spiritual well-being (American Dance Therapy Association, n.d.; Association for Dance Movement Psychotherapy United Kingdom, 2023). DMT is based on the connection between body, mind, and spirit (Levy,

1988) and emphasizes empathy, attunement, and attachment. Empathy fosters attunement, which strengthens attachment in relationships, such as the bond between a parent and child. The rationale for using DMT in this study is supported by neuroscientific findings. The discovery of mirror neurons in the 1990s underscores the importance of the role of empathy in relationships (Rizzolatti & Craighero, 2004; Iacoboni, 2009; Heyes, 2010; Keysers, 2009). Mirror neurons provide the basis for DMT practices such as mirroring which employs kinesthetic empathy, helping build empathy and mutual understanding.

Pioneers in DMT, such as Marian Chace, utilized these empathic processes in psychiatric settings to connect with patients (Chace, 1952; Shelley, 1993). Sandel (1993) described how Chace reflected patients' moods and movements to build interpersonal connections. Studies have showed that DMT has positive effects on emotional issues (Sandel et al., 2005; Samaritter & Payne, 2017). Payne (2017) explored the role of embodiment in enhancing empathy in DMT practices such as Authentic Movement and Laban Movement Analysis. These studies highlight how empathy and attachment, critical for emotional regulation, are supported by the psycho-neurological systems of mirror neurons.

Attachment theory also plays a significant role in emotional regulation. Bowlby (1969) identified attachment behavior as a pre-verbal form of emotional regulation between infants and caregivers. Gilbert (2015) further explored the neuro-physiological basis of attachment, noting that affiliative relationships reduce distress and promote calmness and comfort.

Porges' (2003) Polyvagal Theory offers another neuropsychological perspective on emotional regulation, suggesting that the vagus nerve helps regulate emotions through self-soothing and calming mechanisms. Mindfulness practices, based on this understanding, have been shown to enhance emotional regulation (Kabat-Zinn, 2005; Tang & Leve, 2016).

Self-determination theory (SDT), another key concept for this study, emphasizes self-motivation and self-regulation to achieve optimal well-being (Deci & Ryan, 1985). SDT has been applied to students with intellectual disabilities since 1992 (Wehmeyer, 2004; Carter, 2011; Carter et al., 2008), promoting agency and autonomy. Chad-Friedman et al. (2023) found that children with higher self-esteem and social support exhibited greater improvements in emotional control, underscoring the importance of fostering agency and emotional regulation.

The purpose of this study is to foster agency, empathy, attunement, self-soothing, and emotional regulation in adolescents with intellectual disabilities through a DMT intervention program, incorporating SDT and attachment theory.

Methodology

This study adopted a pragmatic approach (James, 1995) to investigate the impact of a dance/movement therapy emotional self-regulation program on adolescents with intellectual disabilities in Hong Kong. Ethical approval was obtained from the University of Hertfordshire, England and informed consent was provided by all participants, including gatekeepers, teachers, parents, and students. The study used a mixed-methods design, including a pilot study, staff training on the Emotional Self-Regulation (ESR) program, and the main study of a 90-minute weekly dance movement therapy intervention over eight weeks. The program aimed to enhance participants' awareness of space, body, emotions, and emotional regulation strategies.

Purposive sampling was used to recruit students with mild intellectual disabilities from a special school, along with staff from the same institution. A randomized controlled trial (RCT) design was employed, with assessments for both control and experimental cohorts

at three time points: before, immediately after, and at 14 weeks post-intervention. The 14 weeks was the duration students had transitioned from their school into a post-school environment.

The Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 1998) was used for quantitative data collection, with SPSS and T-test analysis for statistical processing. Additionally, a post-intervention focus group was conducted using scenario-based semi-structured questions to explore the emotional regulation process. Verbatim transcriptions were analyzed using NVivo and Thematic Content Analysis (Boyatzis, 1998), with arts-based non-verbal data employed for triangulation.

A pilot study involving four students was conducted on April 10, 2018 to test out recruitment, the intervention and methodology. Based on these findings, the language and layout of the questionnaires were revised to enhance clarity and appropriateness for participants. Feedback from staff also confirmed the feasibility of the ESR program in terms of content, flow, and instructions.

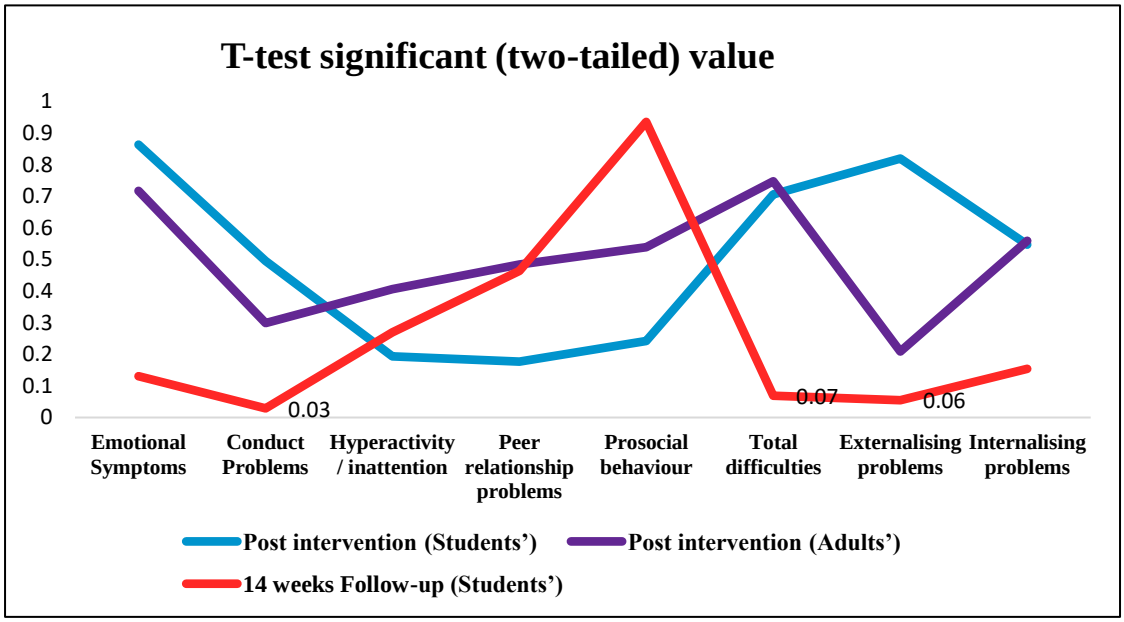
Findings

The fieldwork took place between April and June 2018 in Hong Kong, involving 51 adolescents and five adults. The participants were randomly assigned to either an intervention or control group based on their parents' preferences.

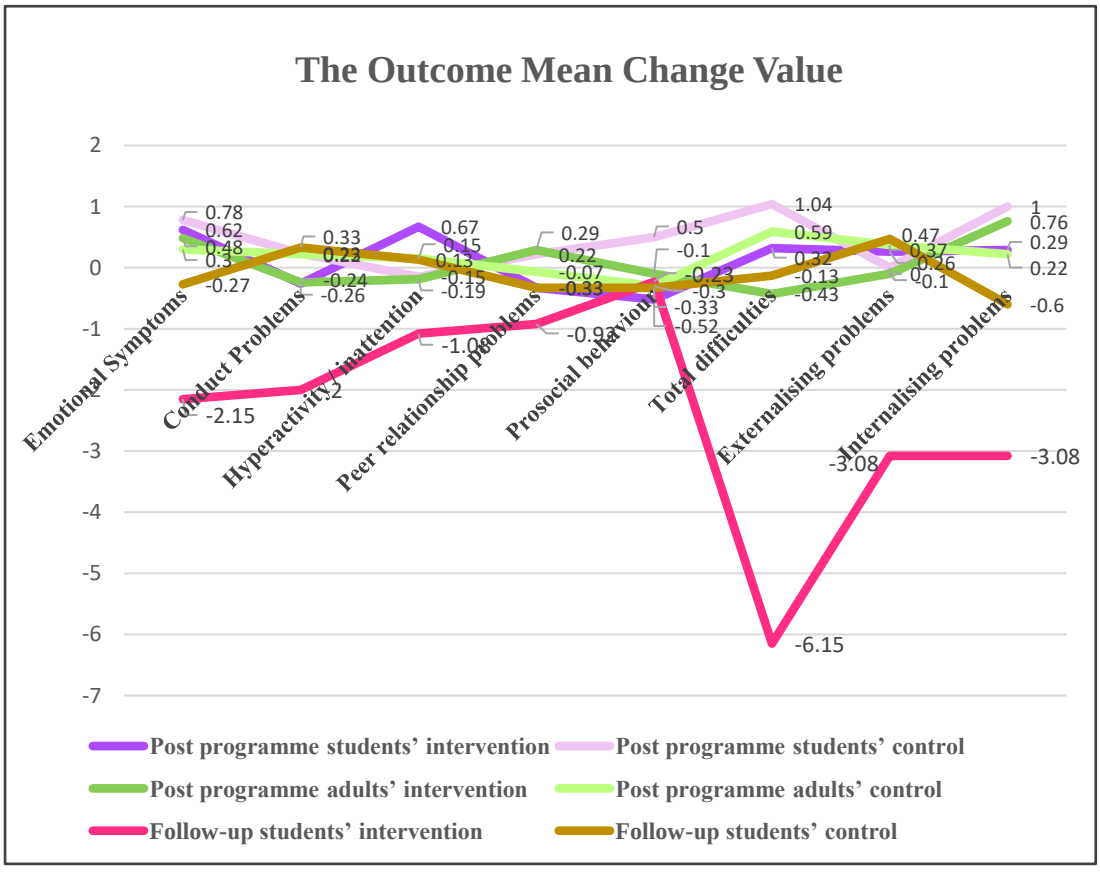
Quantitative results

Independent samples t-test analysis was performed on the SDQ scores collected at three points: before, after, and 14 weeks post-intervention. The variable 'Conduct Problems' showed statistical significance at the 14-week follow-up intervention cohort ($p=0.03$, $p<0.05$). However, no statistically significant results were found immediately post-intervention. Graph 1 illustrates these findings, with a significant improvement in the intervention group at the 14-week follow-up. Graph 2 displays the mean changes over time, showing greater improvements in the intervention cohort compared to the control group.

Graph 1: To show a line graph presenting the p-values of the post intervention and the 14 weeks follow-up (Leung, 2021).



Graph 2: To show the mean values of the intervention and control cohorts at post intervention and follow-up (Leung, 2021).



Qualitative findings

The focus group explored emotional self-regulation strategies using scenario-based questions. Thematic analysis revealed seven primary themes: emotion, body shape, facial expression, speech, cognition, emotional awareness, and emotional regulation strategies. Students linked their emotional awareness to body language and external expressions, such as "folding arms" or "dropping the head." For instance, one student mentioned, *"he has no smile" and "tears dropped [down his face] continuously"*, while another expressed *"[he] does not want to talk"* and *"fear to express himself to others"*. The non-verbal data, including students' drawings, provided additional insights into the emotional regulation process, highlighting the importance of body awareness and the support of others.

The findings revealed that students engaged in reflective and reasoning processes during emotional regulation. For instance, one student suggested that the character in the scenario could "*ask himself why that training center was chosen at the beginning*" and reflect on why he failed to enter it.

Responses regarding emotional awareness varied. Some students affirmed their awareness of emotions during regulation, while others did not. One student explained, "*He*

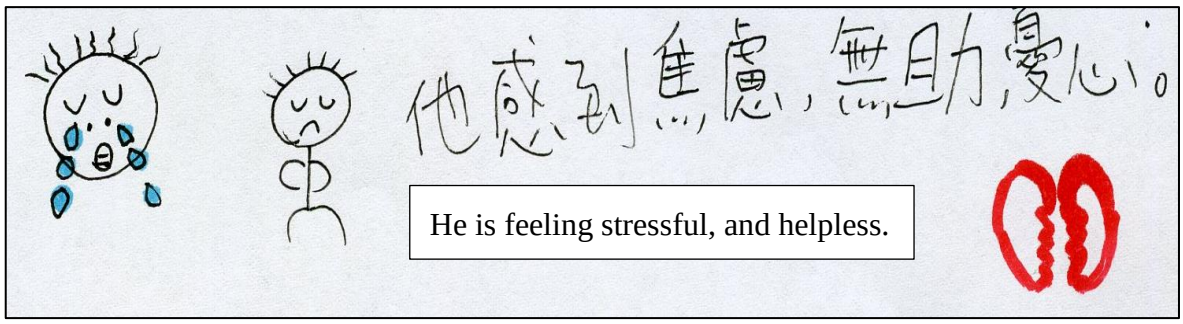
knows. When he is not happy, his face shrinks and he frowns. He must be aware of his emotion." In contrast, another student disagreed, stating, "*Certainly he did not know. There is no reason why he would know*."

Students proposed various strategies to address challenges in stressful environments. They identified the purpose of emotional regulation as managing emotions and alleviating stress. The proposed strategies were categorized into external and internal approaches. External strategies were organized into two themes: (i) support from others, such as "talk to friends" or "seek the advice of a social worker or class teacher to express yourself"; and (ii) support from the environment or engaging in activities, including "visit a beach for relaxation," "go shopping," and "listen to music."

Internal strategies, which focused on self-regulation, were further divided into themes: (i) changing perspective, such as "face issues whole-heartedly with courage" and "be bold and meet new friends"; and (ii) suppressing and avoiding, as in "let go of distressing feelings" or "go rest in the bedroom". Additionally, students suggested a third theme, (iii) engaging in movement and exercise, which included practices like "deep breathing" and "doing light exercises, such as playing table tennis or riding a bicycle".

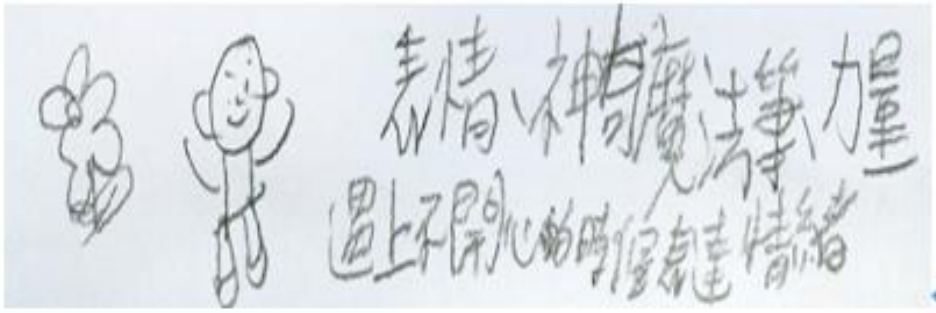
The non-verbal data, including students' drawings and written reflections, emphasized their associations of body shapes and facial expressions with emotions. These reflections captured their experiences and learning from the DMT ESR program. Figure 1 shows a student's depiction of feeling stressed and helpless through body posture.

Figure 1 Drawing of a student showing body shape, facial expression and emotion (Leung, 2021).



Another student described a positive, supportive experience, highlighting increased awareness of peer support during emotional challenges. Figure 2 illustrates another student's reflections after completing the intervention. The student drew pictures together with written words, "I learned to use facial expressions, creative movement to dance. I also learned to express my emotion when I am not happy".

Figure 2 A student's drawing showing the experience of participation in the DMT ESR program (Leung, 2021).



I learned to use facial expressions, creative movement to dance.
I also learned to express my emotion when I am not happy.

Discussion

1. Impact of DMT on Emotional Regulation

   The quantitative results, showing decreased emotional symptoms and improvements in other well-being variables at follow-up, align with previous studies (Sandel et al., 2005; Samaritter & Payne, 2017) highlighting the positive impact of DMT on emotion-related issues.

2. Effective Intervention Results at 14-Week Follow-Up

   Statistical analysis via t-tests revealed the program's effectiveness at the 14-week follow-up, though no strong evidence was found post-intervention. The p-value for "Conduct Problems" was significant at 0.03 ($p < 0.05$) at follow-up, while the post-intervention p-

value was 0.3 ($p > 0.05$), showing no significant change. Performance outcomes revealed noticeable differences between the intervention and control cohorts at both time points, with the greatest improvements seen at the follow-up. For example, the “total difficulties” measure improved to -6.15 at the 14-week follow-up, indicating a greater effect over time. This finding supports previous research on delayed positive impacts at follow-up (Blaauwendraat et al., 2017; Pylvanainen & Lappalainen, 2018), suggesting that time may be necessary to apply learned emotional regulation strategies in new environments, like the post-school setting in college.

3. Emotional Self-Regulation Process

The qualitative data revealed students' understanding of emotional regulation, which they described as the ability to adjust, manage emotions, and calm oneself. The findings indicated that students had a basic knowledge of emotional regulation and could identify emotions triggered by external events. They demonstrated increased bodily awareness, making connections between emotions and physical manifestations such as body posture, facial expressions, and vocal tone. Additionally, they were able to name specific emotional regulation strategies, with many students suggesting techniques like washing

their faces or drinking water to calm down. Some students also exhibited reflective thinking and personal transformation; for instance, some shifted from avoiding social situations in unfamiliar environments to approaching these situations as opportunities to engage with others.

The emotional regulation process for these students could be summarized in the following five steps:

i) An external incident triggered a change in emotion;

ii) Individuals displayed emotional awareness through observations of bodily cues, facial expressions, and vocal changes, although a few (27%) reported emotional unawareness;

iii) Individuals selected strategies to regulate uncomfortable emotions;

iv) Emotional regulation strategies included external approaches, such as seeking support from people or modifying the environment, and internal approaches, such as self-control or reframing perspectives;

v) The process of emotional self-regulation led to not only emotional changes but also cognitive, relational, physical, and spiritual shifts.

4. Emotion and External Environment

Qualitative findings showed that participants identified emotional changes were triggered by external incidents, aligning with theories from Darwin (1965), Solomon (2003), and the James-Lange theory (cited in Solomon, 2003), which ties emotional perception to physiological responses to external events.

5. Emotional Awareness

The findings demonstrated participants' growing understanding of emotions and emotional awareness, as well as their use of emotional regulation strategies. While most participants agreed people could be self-aware of their emotions, a few disagreed. Participants reported that emotions became conscious through changes in bodily sensations, facial expressions, or comments from others. This aligns with Freud's ideas on unconscious emotions (Freud et al., 1973), and the embodiment of emotion observed in this study supports theories from Mauss and Robinson (2009) and Gendlin (1996), who link bodily sensations to emotional awareness. The findings reinforce that this intervention enhanced participants' emotional self-awareness.

6. Emotional Regulation and Affiliation Relationships

Participants employed diverse emotional regulation strategies, including cognitive evaluations, bodily changes, and relational processes like seeking help. Affiliation with others emerged as a key emotional regulation method, supporting Bowlby's (1969) attachment theory and studies by Gross and Muñoz (1995) and Gilbert (2015), which highlight the neuro-physiological role of relationships in emotional regulation. Findings also support the concept of "embodied simulation" (Gallese, 2009) and DMT research (Sandel, 1993; Payne, 2017), which demonstrate how mirroring in DMT fosters empathy and attachment.

7. Best Practices from the Dance/Movement Therapy Intervention

This study expands the understanding of emotional regulation processes in a dance/movement therapy intervention. Participants named triggers, gained emotional awareness through bodily sensations, facial expressions, and speech, and reflected on their choices for emotional regulation strategies. They experienced emotional, relational, cognitive, and spiritual shifts, reinforcing the program's holistic approach. The findings also showed that participants enjoyed creative experiences in the ESR program and learned new emotional regulation tools, such as mindfulness and breathing exercises.

Conclusion

This research found that only a small portion of the results was supported by statistical evidence; however, the qualitative findings revealed the positive effect of the emotional regulation program. The application of Dance/Movement Therapy (DMT) principles in this intervention program appeared to foster increased body awareness among participants. Dance/movement therapy activities also seemed to enhance interpersonal skills and fostered interaction within the group, supporting findings from previous research. The incorporation of Self-Determination Theory in this study provided each student with the opportunity to make autonomous choices throughout the program. A DMT ESR program grounded in Self-Determination Theory may have contributed to enhancing participants' cognitive processes.

The intervention provided a practice-based experience to embody feelings, gain body and emotional awareness, process experiences, and increase consciousness to make informed choices. The incorporation of DMT in the program fostered the development of empathy, attunement, and attachment. Nonetheless, there were limitations in the program's duration and the number of participants. For future studies, it is recommended to extend the duration

of the program and recruit students with intellectual disabilities (ID) from mainstream schools. Finally, the experiences from the current research may offer valuable insights to the fields of education, social sciences, and DMT studies.

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