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Intervention Strategies to Combat the Impacts of COVID-19 on Adolescents Mental Health: A Critically Appraised Topic

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Rylie M. Garner, Lauryne P. Griego, Kailey A. Squier & Jamie M. Steinhoff, 2022

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Focus Question

Does sensory modulation and physical activity as an occupational therapy intervention improve mental health outcomes in adolescents resulting from the COVID-19 pandemic?

Case Scenario

In late 2019, the coronavirus (COVID-19) surfaced and rapidly escalated into a global pandemic, causing a significant disruption in the lives of individuals around the world and has led to adverse health effects, social disconnectedness and isolation, occupational deprivation, and life-altering changes (Kiss et al., 2022). The ramifications of the COVID-19 pandemic have been multifaceted, reaching far beyond the physical symptoms, resulting in unprecedented emotional responses (Cohen, 2021). The pandemic's precautionary measures, such as quarantine, physical distancing, and limited social gatherings, have had troubling impacts on mental health, specifically increased levels of stress and anxiety, and physiological consequences (Otu et al., 2020). Adolescents are especially vulnerable to the mental health consequences of the pandemic, particularly those with preexisting mental health conditions or early life stress (Cohen et al., 2021; Miller et al., 2021.). Research shows that adolescents are at higher risk than adult populations to the impact of stressful events, such as the pandemic (Miller et al., 2021). During adolescence, the predominant features that impact occupational performance are emotional salience, executive functions, and increased stress susceptibility (Miller et al., 2021).

In recent years, there has been a significant increase in mental health disorders across the adolescent population due to occupational disruption (McKim et al., 2021). Occupational therapy (OT) maintains a distinct role in the provision of mental health services and has addressed the increase in mental health disorders. The COVID-19 pandemic has initiated a critical opportunity for OT as a profession to return to its roots in supporting the mental health community and maintain a distinct role in the mental health community (Lannigan & Tyminski, 2021). It is important to note that with the onset of COVID-19 there is potential for societal and systemic inequities, as people from marginalized populations experience limited access to health care, employment opportunities, and government resources that make this population vulnerable to physical, mental, and economic consequences (Lannigan & Tyminski, 2021). OT practitioners have the means to ensure occupational justice and advocate for the specific needs of this population to increase occupational engagement and increase the quality of life (Lannigan & Tyminski, 2021).

The Person Environment Occupation (PEO) model has been used as the foundational theory to address mental health and the proposed interventions with consideration of person, environment, and occupation (Andelin et al., 2021). Through the lens of the PEO model, we explored the transactional fits between mental health, adolescents, and COVID-19. The transaction between the person, their mental health diagnoses, and the environment that COVID-19 has brought about has in turn impacted adolescent occupational participation. Examining the dynamic transactions of PEO will guide mental health interventions to address occupational engagement and improvement in mental health populations.



Purpose Statement

Adolescents are experiencing significant mental health impacts as a result of the COVID-19 pandemic (McKim et al., 2021). Currently, there is a limited amount of evidence linking the use of OT interventions to address the COVID-19 pandemic and its effect on mental health in adolescents. The purpose of this critically appraised topic is to examine the effectiveness of sensory modulation and physical activity occupational therapy interventions in improving mental health impacts from the COVID-19 pandemic.

Summary of Key Findings

Search Strategy Methods

A total of 40 articles were initially reviewed for this critically appraised topic through the University of North Dakota (UND) library, PubMed, CINAHL, and a Google site search. Seven articles met our inclusion and exclusion criteria supporting physical activity and sensory modulation as interventions. Articles selected were three level II studies, including a crossover study (Frühauf et al., 2020), a longitudinal cohort study (Kiss et al., 2022), a two-wave longitudinal study (Rogers et al., 2021), one level III non-experimental cross-sectional study (Bélair et al., 2018), two level N/A studies including an exploratory study with mixed methods (Blackburn et al., 2016), and a qualitative study with semi-structured interviews (Williamson & Ennals, 2020). Additionally, a continuing education article with an expert opinion was reviewed (Andelin et al., 2021).

Inclusion & Exclusion Criteria

Inclusion criteria of this critically appraised topic included: mental health, adolescent and young adults aged 11 to 25 years of age, the coronavirus (COVID-19) pandemic, sensory modulation, physical activity, occupational therapy interventions, and articles that have been published in the last five years. Exclusion criteria included: participants younger than 11 and older than 25 not being categorized as adolescents or young adults, articles not containing information about mental health, sensory modulation, physical activity, the COVID-19 pandemic, occupational therapy, and articles published over five years ago.

Level II Studies

Three level II studies examined the importance of physical activity as an intervention for adolescents experiencing mental health disorders. Frühauf et al. (2020) conducted a cross-over study identifying and comparing three separate interventions (climbing, swimming, and occupational therapy) and the affective response pre and post-intervention. The sample population included 33 adolescents diagnosed with depression and emotional disorders. The mean age of the adolescents was 13.3 +/- 2.2 years who resided in a mental health inpatient setting. The primary inclusion criteria were that the adolescents had to be in-patient for at least three weeks and were physically able to participate in the interventions. Exclusion criteria were adolescents having severe acute symptoms and being unable to perform the activity. The study



found that similar effects on affective responses pre to post interventions may have implications for interventional needs and acute emotional regulation in adolescents with mental health disorders.

Kiss et al. (2022) conducted a longitudinal study that identified young adolescents who are most vulnerable to the psychological toll of the COVID-19 pandemic and provided insight to inform strategies to help adolescents cope better in times of crisis. The study included 3,000 adolescents aged 11-14 years. The inclusion criterion for the study was that adolescents were within the established age range. Exclusion criteria included a current diagnosis of schizophrenia, autism spectrum disorder (moderate, severe), mental retardation/intellectual disability, alcohol/substance use disorder, non-correctable vision, hearing or sensorimotor impairments, major neurological disorders, gestational age less than 28 weeks and birth weight less than 1.2 kilograms, birth complications other than those associated with prematurity that resulted in being hospitalized for more than a month and a history of traumatic brain injury or MRI contraindications (Kiss et al., 2022). The results from the study revealed the importance of social connectedness and healthy behaviors, such as sleep and physical activity, during the COVID-19 pandemic, to reduce the effects on adolescents' mental health. This study also highlighted the need for coping strategies, such as maintenance of daily routines, healthy behaviors, and engaging in social participation to be examined as a means to limit the long-term adverse health effects of the COVID-19 pandemic (Kiss et al., 2022).

Rogers et al. (2021) conducted a mixed-methods study to examine adolescents' perceptions of how the COVID-19 pandemic has affected their social and emotional lives while also examining associations between perceived changes and the indices of their mental health. The participants included 407 adolescents between the ages of 14-17 years who came from both urban and rural areas in four major U.S. regions. The participants completed surveys before and during COVID-19. The study found that adolescents perceived numerous changes in their lives, both social and emotional, since the COVID-19 pandemic began. Social and emotional changes were found to include elevated symptoms of depression, increased anxiety symptoms, and significant loneliness.

Level III

Bélair et al. (2018) examined the cross-sectional association between physical activity, sedentary activity, and symptoms of depression and anxiety by utilizing a survey design. The sample size included 9702 respondents aged 14-15 years. Bélair et al. (2018) suggested that physical inactivity and sedentary activity appear to be significantly related to symptoms of depression and anxiety. This was a result of the seven items taken from the Ontario Child Health Study. The items on this scale were closely related to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) criteria for emotional disorders.



Level N/A Studies

Three level N/A studies examined the value of sensory modulation as an intervention for the mental health community and adolescents. Blackburn et al. (2016) evaluated the effectiveness of implementing a sensory modulation intervention education program among their clinical staff at an acute mental health inpatient unit to determine the ability to transfer knowledge from staff training to practice. A total of 19 clinical staff from the acute mental health inpatient unit participated in the study. The study conducted a mixed-methods design consisting of a quantitative education questionnaire and qualitative focus groups three months after the conclusion of the educational program. Blackburn et al. (2016) found that the educational package developed regarding sensory modulation as an intervention helped healthcare clinicians gain an understanding of the intervention. Additionally, three months after the study concluded, the participants were able to describe the benefits and limitations of the intervention while also effectively implementing it into their practice and remaining mindful of the safety of all consumers and staff.

Williamson and Ennals (2020) explored the use of sensory modulation within the community and how it enhanced occupational participation in the daily lives of people with mental health. The study utilized semi-structured interviews among participants aged 16-25 who have a mental health diagnosis and their families to examine their experiences with sensory modulation and how it has enhanced their occupational participation in their daily lives. Participants engaged in the Adolescent/Adult Sensory Profile and completed at least one intervention session as part of their routine community mental health care. Participants were excluded if they had a diagnosis of autism spectrum disorder, were admitted to an inpatient setting during the study, or if their care team identified that participation may have negatively impacted the person's mental health. Results of this study showed that sensory modulation supported young peoples' occupational participation in the domains of sleep, study, relationships, self-care, independent living, and being in the world and doing new things.

Andelin et al. (2021) was an expert opinion continuing education article published by the American Occupational Therapy Association (AOTA). The article illustrated implications for occupational therapists in various settings regarding how frameworks can be applied to practice, while evaluating and providing effective interventions for mental health diagnoses and sensory difficulties. Throughout the article, it discussed what sensory integration is, how it can be used as an intervention, what children are experiencing as a result of the COVID-19 pandemic, how to apply theoretical frameworks to practice, and the benefits that applying sensory modulation as an intervention can have on clients with mental health diagnoses and symptoms. The article concluded by stating that "occupational therapy practitioners have a comprehensive set of tools and a unique skill set to help clients with mental health and sensory processing differences" (Andelin et al., 2021, p. CE-7).



Synthesis of Evidence

Sensory Modulation

As evidenced by numerous articles, sensory modulation has been found to aid in addressing mental health diagnoses and symptoms (Adelin et al., 2021; Blackburn et al., 2016; Williamson & Ennals, 2020). Sensory modulation has a twofold definition, as a neurological process and an intervention approach. As a neurological process, sensory modulation is defined as:

...the capacity to regulate and organize the degree, intensity, and nature of responses to sensory input in a graded and adaptive nature. This allows the individual to achieve and maintain an optimal range of performance and to adapt to challenges in everyday life. (Williamson & Ennals, 2020, p. 459)

Sensory modulation has been found to reduce numerous mental health symptoms and diagnoses and general challenges, including but not limited to social isolation, learning difficulties, praxis disorders, and increased anxiety and depression (Adelin et al., 2021). As a developing intervention in occupational therapy, sensory modulation has numerous approaches, with critical features involving utilizing the seven senses to self-regulate through activities or occupations (Williamson & Ennals, 2020). This is an ongoing collaborative intervention process, individualized to the client, being monitored by the therapist, supporting sensory needs, being evidence-based, and utilizing sensory activities and adaptations such as sensory diets, multi-sensory rooms, and sensory education for the client (Adelin et al., 2021; Blackburn et al., 2016; Williamson & Ennals, 2020). Numerous studies emphasized the importance of educating OT practitioners in sensory modulation interventions (Adelin et al., 2021; Blackburn et al., 2016; Williamson & Ennals, 2020). Research has found that educating OT practitioners aids in improving positive outcomes for clients, including occupational participation, minimizing distress, improving mental health symptoms, increasing attention, enhancing self-regulation and behavioral organization, influencing safety, improving social relationships, minimizing aggression, and aiding in strategy development for crisis de-escalation (Adelin et al., 2021; Blackburn et al., 2016; Williamson & Ennals, 2020). As sensory modulation interventions have been developing and arising in popularity for the OT community at large, it has been shown that sensory modulation has been effective for clients in improving occupational participation. Additionally, it is recommended as an important and positive intervention to implement in mental health settings to manage mental health diagnoses, support occupational engagement, and improve the overall quality of life for clients (Adelin et al., 2021; Williamson & Ennals, 2020).

Physical Activity

Integrating physical activity as an intervention for adolescents has positive outcomes for mental health and has been shown to mitigate psychosocial symptoms of mental health compared to adolescents who experience inactivity (Bélair et al., 2018; Kiss et al., 2022). It is recommended that adolescents participate in 60 minutes of physical activity a day or more than one day a week to improve overall mental health symptoms, self-esteem, increase social support, and encourage



a feeling of achievement in occupational roles (Bélair et al., 2018; Frühauf et al., 2020; Kiss et al., 2022). Research has found that there is a positive correlation between physical activity and mental health, demonstrating it to be an effective supplement for increasing occupational engagement in adolescents (Bélair et al., 2018; Kiss et al., 2022). It is important to note that the use of physical activity as an intervention strategy is cost-effective, has low adverse side effects, may reduce the odds of developing mental illness, and in some instances is comparable to pharmacological treatments (Bélair et al., 2018; Frühauf et al., 2020). Physical activity is a strong predictor of emotional well-being and gives rise to positive affective experiences (Frühauf et al., 2020; Kiss et al., 2022).

Strengths & Limitations

Within these seven articles, there were several noted strengths and limitations. The expert opinion article written by Andelin et al. (2021) did not address strengths and limitations, due to the nature and type of article. The primary limitation found by three of the articles was the degree to which results can be generalized to other populations due to the limited sample that was chosen by the researchers (Frühauf et al., 2020; Kiss et al., 2022; Williamson & Ennars, 2020). Another common limitation discussed by three of the articles was that they had limited operational definitions and occupational therapy language, which also may have limited the scope of the studies (Bélair et al., 2018; Frühauf et al., 2020; Williamson & Ennars, 2020). Other important noted limitations by articles included lack of randomization, lack of co-creation among OTs and mental health practitioners, having conceptual overlaps in surveys, and limiting pre-education for researchers and clinicians (Blackburn et al., 2016; Frühauf et al., 2020; Rogers et al., 2020; Williamson & Ennars, 2020).

Although there are numerous strengths that the articles had in common, two articles, including Rogers et al. (2020) and Blackburn et al. (2016), did not have any strengths mentioned. Four studies included a large sample size which increased the generalizability and applicability of these studies (Bélair et al., 2018; Frühauf et al., 2020; Kiss et al., 2022; Williamson & Ennars, 2020). Another important strength found between three of the studies is that they have strength in their design with methodological and ecological validities, improving the accuracy of the findings (Bélair et al., 2018; Frühauf et al., 2020; Williamson & Ennars, 2020). Finally, Williamson & Ennars (2020) had a naturalistic inquiry design that focused on and facilitated comprehensive and important findings.

Clinical Applicability

The overall purpose of this CAT is to examine sensory modulation and physical activity as occupational therapy interventions in improving mental health impacts in adolescents from the COVID-19 pandemic. Because adolescents are at a vulnerable stage in their lives, COVID-19 is affecting them at an unprecedented rate, and further research must be conducted. The selected literature shows the effectiveness of sensory modulation and physical activity as interventions to improve mental health impacts in adolescents (Adelin et al., 2022; Bélair et al., 2018; Blackburn et al., 2016; Frühauf et al., 2020; Kiss et al., 2022; Rogers et al., 2020; Williamson & Ennars,



2020). Though the literature does not address the selected interventions as a means to improve the mental health impact in adolescents resulting from impacts of the COVID-19 pandemic, they are suggested to improve overall mental health. It is within OTs scope of practice to provide services to oversee engagement in activities that provide meaning in life, during a period where participation is disrupted and people are affected by COVID-19 (Hoel et al., 2021). Given the adverse health effects of COVID-19, it is crucial that OTs collaborate with other professionals to provide holistic care. A significant challenge in healthcare is understanding OTs' distinct role among interprofessional teams, therefore, addressing this challenge is needed for effective interprofessional collaboration (James et al., 2020).

OT focuses on enabling adolescents to engage in daily occupations, and in regard to the mental health community, OTs focus on expanding an adolescent's range of skills and tools to manage their disorders. COVID-19 has interrupted adolescents' daily routine, lifestyle, work, and future plans creating disruptive changes in resource availability, community access, and health and wellbeing. Given the obstacles identified in relation to the pandemic, adolescents have experienced an increased negative affect during COVID-19 (Rogers et al., 2021). Emotional experience is a root cause of the underlying mental health of adolescents, and thus COVID-related stressors may contribute to shifts in adolescents' affectivity (Rogers et al., 2021). Because of OT's role in mental health, they are equipped with the skills necessary to facilitate engagement in social participation, physical activity, and other activities that provide meaning in life at a time when COVID-19 has brought upon unmeasurable challenges in a vulnerable time in adolescents' lives (Bélair et al., 2018; Hoel et al., 2021; Kiss et al, 2022).

While the intervention approaches of physical activity and sensory modulation were identified, further research is needed to determine the link between the effectiveness of the intervention approaches in addressing the mental health impacts of the COVID-19 pandemic. Although further research is needed, both interventions prove to be effective in improving adolescents' mental health (Adelin et al., 2021; Bélair et al., 2018; Blackburn et al., 2016; Frühauf et al., 2020; Kiss et al., 2022; Williamson & Ennals, 2020). With this, we can bridge the gap using the theoretical framework of the PEO model. Upon drawing from the interconnected relationship between the person, environment, and occupation, we can use a client-centered approach to promote participation, develop innovative approaches, and improve adolescents' self-efficacy (Andelin et al., 2021). With OT's focus being on remedial and restorative treatment, practitioners are prepared to address the repercussions of the COVID-19 pandemic and furthermore, aid in the rehabilitation of adolescents' physical, cognitive, and psychosocial development.

Concerning this topic, there is a need to recognize cultural considerations and occupational injustice as a result of the COVID-19 pandemic. Marginalized populations are at risk of stigmatization and discrimination, and are currently experiencing or witnessing stress, anxiety, and depression due to the pandemic, which is associated with a decline in their mental health (Kiss et al., 2022; Lannigan & Tyminski, 2021). As the spread of COVID-19 continues, many people are experiencing bias as a result of their identified demographic due to stereotypical misinformation (Otu et al., 2020). There is still work needed to further explore the relationship between the COVID-19 pandemic and occupational injustices among vulnerable populations.



Interprofessional collaboration among other healthcare disciplines including OT, professional organizations, and community partners is critical to educate, advocate and promote changes and awareness of social injustices that have been created as a consequence of the COVID-19 pandemic (Hoel et al., 2021; Lannigan & Tyminski, 2021).

Sensory modulation and physical activity have been shown to have promising outcomes in mental health impacts among adolescents. Research presents these interventions as standalones within occupational therapy practice. It is our aim that these two interventions can be integrated into occupational therapy practice as a means to support adolescents who are experiencing mental health impacts from the COVID-19 pandemic.



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