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# **The Use of Sensory Processing Interventions to Improve Academics and Social Participation for Adolescents with Trauma**

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### **Focused Question**

Do adolescents ages 5-18 who have experienced trauma exhibit an increase in social participation and academic success when provided with sensory processing interventions?

### **Clinical Scenario**

Childhood and adolescent trauma are defined as psychological, physical, and sexual abuse, as well as household dysfunctions that include substance abuse, criminal history, mental illness, and witnessing violence or abuse against a parent (Felitti et al., 1998; Noel-London et al., 2021). Adverse childhood experiences (ACEs) are a form of trauma for those under the age of 18 involving neglect and abuse (Elmore & Crouch, 2020). ACEs have been shown to have a lasting impact on an individual's life, including violence, behavioral disorders, and mental health disorders (Noel-London et al., 2021; Sigurvinsdottir et al., 2021). ACEs and trauma can impact all areas of one's life, especially engagement in social participation (Harazneh et al., 2020). Stress and trauma can have an immediate impact on an individual and influence his or her social development, as well as create lasting effects (Kerker et al., 2015). Social development will impact adolescent's approach to engaging in social interactions. Trauma and an individual's social development will also relate to his or her engagement in academics.

Trauma has played a role in the academic success of adolescents. Maltreated youth and adolescents are at a greater risk for academic deficits compared with their non-maltreated classmates, their perceptions of relationship quality with parents and peers can predict their academic achievement (Hershberger & Jones, 2018; McGuire & Jackson, 2018). Along with perceptions of relationship quality and maltreatment, academic attendance can be impacted by maltreatment. School absenteeism is a large predictor of academic success and failure, and it is found that maltreated adolescents are more often absent from school and therefore have decreased academic success (Hagborg et al., 2018). Trauma has an immense impact on adolescent social participation and academic success, these two factors may be impacted by their ability to process sensory information.

Emerging evidence in neuroscience indicates that exposure to trauma in children and youth affects brain development, specifically the ability to process sensory information and sensory processing patterns (Dowdy et al., 2020; Fraser et al., 2017). With this information, trauma-informed care and trauma-based interventions are becoming an emerging area of practice for occupational therapy (Fraser et al., 2017). With a skill base in sensory integration and occupational analysis, occupational therapists have much to offer in the field of trauma studies and are well equipped to address developmental and sensory deficits stemming from trauma (Dowdy et al., 2020; McGreevy & Boland, 2020). Occupational therapists use sensory-based approaches to increase individuals' occupational engagement in adolescents who have experienced traumatic events (Fraser et al., 2019). Theoretical models are often used by occupational therapists to guide their practice, and a model that is applicable to a client's environment and engagement in occupations includes the Ecology of Human Performance (EHP) model.

The EHP model is relevant to adolescent trauma and its impact on occupational engagement because of its focus on environment and performance range (Dunn, 2017). The EHP model focuses on the performance range of an individual and how it fluctuates based on their personal factors and context. The performance range determines the individual's overall ability to engage in specific tasks (Dunn, 2017). If a therapist were to apply this model and implement sensory processing interventions to support an adolescent's personal factors and context, then



their performance range may increase and allow them to fully engage in their tasks of social participation and academics.

The overall purpose of this paper is to assist occupational therapists in making clinical decisions involving the use of sensory processing interventions to address the problems associated with academic success and social participation in adolescents who have experienced trauma.

### **Synthesized Summary of Key Findings**

For this critically appraised topic, we reviewed 12 articles including one meta-analysis (McGuire & Jackson, 2018), two systematic reviews (Battin et al., 2020; Hershberger & Jones, 2018), one scoping review (Fraser et al., 2017), two mixed methods studies (Dowdy et al., 2020; Linkugel et al., 2020), one cross-sectional study (Kerker et al., 2015), two surveys (Elmore & Crouch 2020; Sigurvinsdottir et al., 2021), and three qualitative studies (Hagborg et al., 2018; Halevi et al., 2016; Lemkin et al., 2018; ). Authors agreed that trauma negatively impacts the mental health of adolescents ages 5-18 which leads to decreased performance in academics and social participation (Elmore & Crouch 2020; Hagborg et al., 2018; Halevi et al., 2016; Hershberger & Jones, 2018; Lemkin et al., 2018; McGuire & Jackson, 2018). In a prospective longitudinal study that followed 232 children ages 1.5 to 11 years old, Halevi et al. (2016) found that trauma experienced in childhood may influence the chance that these individuals experience psychopathological conditions later in life. These conditions may include post-traumatic stress disorder, conduct disorder, and attention-deficit/hyperactivity disorder (Halevi et al., 2016). Trauma experienced early in life such as adverse childhood experiences has been found to impact mental health later in life, leading to conditions such as anxiety and depression (Elmore & Crouch, 2020; Kerker et al., 2015; Sigurvinsdottir et al., 2021). Both psychopathological conditions and mental health conditions can have a strong influence on an individual's social participation. Trauma experienced in childhood has a lasting impact on development, making it more challenging to engage in age-related activities and social participation with peers (Halevi et al., 2016). In a cross-sectional survey where data was gathered from 7,365 adolescents, Sigurvinsdottir et al. (2021) related their study to Agnew's strain theory. This theory proposed that there is an unavoidable strain experienced which leads to negative emotions. This unavoidable strain can be experienced after trauma, therefore impacting many areas of a person's life (Sigurvinsdottir et al., 2021).

In two qualitative studies comparing maltreated adolescents and youth, Hagborg et al. (2018) and Lemkin et al. (2018) identified similar barriers to academic success for adolescents who experienced trauma. They found that maltreatment led to increased dropout and absenteeism for adolescents which decreased academic success (Hagborg et al., 2018; Lemkin et al., 2018). McGuire & Jackson (2018) supported these findings as their research found that maltreated youth tended to score lower on measures of academic success compared to their non-maltreated counterparts. In a systematic review and qualitative study on maltreated youth and adolescents, Hershberger & Jones (2018) and Lemkin et al. (2018) went further to describe possible solutions to increase academic success for adolescents who have experienced traumatic events. The findings from these studies emphasized the importance of healthy relationships with parents and peers for maltreated youth, as well as involvement in school club participation to decrease the risk of school dropout and increase academic performance (Hershberger & Jones, 2018; Lemkin et al., 2018). In addition to these solutions to improve academic success, sensory processing



interventions have been found to increase academic performance and social participation for adolescents who have experienced trauma.

Through recent years, researchers have been trying to understand the effect of trauma and how it can impact an individual's ability to participate in daily activities. This research has led to unique findings showing that trauma-informed care approaches in health care can make a difference for adolescents who have experienced trauma. This has led occupational therapists to look at trauma-based care and create different sensory intervention approaches to help adolescents who have experienced trauma in their past (Battin et al., 2020; Fraser et al., 2017; Linkugel et al., 2020). Examples of sensory-based interventions used by occupational therapists include: finger painting with shaving cream, creating rain sticks, drawing, listening to and creating rhythmic music, exploring aromatherapy or fidgets, practicing meditation, playing kinetic sand games, and making peel-and-stick sand art (Dowdy et al., 2020).

The findings of two studies reviewed on incarcerated youth who have experienced traumatic events, indicated that sensory processing interventions helped to reduce violent behaviors among this population (Dowdy et al., 2020; Linkugel et al., 2020). It was found that incarcerated youth who had received occupational therapy, for sensory integration, had shown significantly lower rates of violence (Linkugel et al., 2020). In a mixed method study comparing incarcerated youth, Dowdy et al. (2020) went further to find that sensory-based occupational therapy interventions not only helped incarcerated youth reduce violent behaviors, but they also improved emotionally, developed positive behavior changes, and felt empowered. Another study looked at how environment modification can help adolescents who experienced trauma during their youth. The researcher found that environmental modification had strong to moderate evidence at increasing participation at home and at school for children and adolescents with sensory processing challenges (Battin et al., 2020). Additionally, the research by Dowdy et al. (2020) supports the use of sensory processing interventions and how they can decrease violent behaviors in maltreated adolescents. They noted this decrease in violent behavior may increase social participation and academic success as a result of the development of positive behaviors and feelings of empowerment. The EHP model focuses on the performance range and how it fluctuates based on an individual's personal factors and context (Dunn, 2017). As shown in Dowdy et al. (2020), sensory processing interventions will improve maltreated adolescents' behaviors and feelings of empowerment. These improvements of behaviors correlate with these individuals' personal factors which we anticipate will lead to improvement in their performance range and overall engagement in social participation and academics.

Overall, it was found that trauma negatively impacts social participation and academic success for maltreated adolescents (Elmore & Crouch 2020; Hagborg et al., 2018; Halevi et al., 2016; Hershberger & Jones, 2018; Lemkin et al., 2018; McGuire & Jackson, 2018). Sensory processing interventions have been shown to increase social participation and academic success for this population (Battin et al., 2020; Linkugel et al., 2020).

### **Clinical Practice Applicability**

The purpose of this critically appraised topic is to determine if adolescents ages 5-18 who have experienced trauma exhibit an increase in social participation and academic success when provided with sensory processing interventions. Social participation and academics for adolescents, ages 5-18 years old, are negatively affected by traumatic experiences (Hagborg et al., 2018; Halevi et al., 2016; Lemkin et al., 2018). Sensory processing interventions have been shown to positively affect adolescent behaviors which have been impacted by trauma (Dowdy et



al., 2020). Studies support the use of sensory processing interventions to help decrease the effects of trauma and increase adolescent social participation and academic success (Battin et al., 2020; Dowdy et al., 2020; Linkugel et al., 2020). It is clear that trauma negatively impacts adolescents' occupational engagement in social participation and academics. Since occupational therapists are experienced in mental health and sensory integration they can have a major role in providing intervention and supporting occupational engagement for this population (Dowdy et al., 2020; McGreevy & Boland, 2020). Evaluation, interventions, and implementation of programming for this population should include occupational therapists, psychologists, caseworkers, teachers, and caregivers (Fraser et al., 2017; Hershberger & Jones, 2018; Lemkin et al., 2018). The practice context is important to consider as much of the evidence provided was based on a wide variety of settings. The research was conducted in a variety of settings including educational settings, juvenile correction settings, residential settings, and healthcare settings. Culture should also be considered with this population as it will play a role in how adolescents view their traumatic experiences and how it affects their engagement in therapy, academics, and social participation.

Even though the research was conducted in a wide variety of settings, the full population may not be represented in the literature as many adolescents who have experienced trauma may have less access to healthcare and social support from professionals. In addition, many of the studies are based on a small sample of adolescents which makes it hard to generalize the findings to a larger population. Another potential bias from the literature is that some of the studies did not look at adolescents' full occupational performance which indicates the need for further research on the effect of sensory interventions. Occupational therapists that implement sensory processing interventions should be trained in these services and stay up-to-date in current evidence based research related to this topic. An important factor that therapists should consider is building strong rapport and relationships with adolescent clients to make them feel at ease (Taylor, 2020). Another limitation that was found was that none of the articles integrated the EHP model into the study. For future studies, researchers should look at the impact of sensory processing interventions and the effect that it has on an adolescent's performance range to further understand the use of the EHP model. Based on the literature reviewed, there is strong evidence which suggests that sensory processing interventions are effective in increasing social participation and academic success for adolescents, ages 5-18, who have experienced trauma.



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