Adverse Childhood Experiences (ACEs), Perinatal Mood and Anxiety Disorders (PMADs), Attachment Theory, and Self/Co-regulation: Their Interconnection and Impact on the Transition to Motherhood

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Abstract

Adverse childhood experiences (ACEs) and perinatal mood and anxiety disorders (PMADs) can negatively impact the transition to motherhood, contributing to physical and emotional barriers between the mother and baby. ACEs and PMADs can also prevent a secure attachment from being formed within the dyad, adversely impacting the neurobiological and socio-emotional development of the child. Although the topics have been explored individually, there remains a gap in literature that thoroughly investigates the interconnection between ACEs, PMADs, secure attachment development, maternal self/co-regulation, and how occupational therapists can contribute to the maternal health field. It is hypothesized that in educating other healthcare professionals, the healthcare community will achieve improved interdisciplinary collaboration and provide a comprehensive care approach that may have positive impact upon the outcomes of the mother-baby dyad. 23 professionals who worked with the maternal and/or early intervention population viewed a 23-minute educational video broadcasted via YouTube. A pre and post questionnaire was provided to obtain feedback regarding the viewers' understanding of the topics. There was a significant increase in awareness in all topics that were discussed. Professionals who have accurate understanding of how ACEs and PMADs impact motherhood, can provide insight, education, and intervention implementation, which can promote improved quality of life for the mother and child. Further research with controlled IRB parameters on this topic is warranted to obtain a broader scope of the foundational knowledge that other professionals possess, as well as to provide insight on how valuable the occupational therapy professional can be within the maternal health space.

Keywords: maternal health, adverse childhood experiences (ACEs), perinatal mood and anxiety disorders (PMADs), attachment theory, regulation

Adverse Childhood Experiences (ACEs), Perinatal Mood and Anxiety Disorders (PMADs), Attachment Theory, and Self/Co-regulation: Their Interconnection and Impact on the Transition to Motherhood

Motherhood can be a joyful, yet challenging journey. The ability to cultivate and nurture the dyadic bond between the mother and child can be shaped by the woman's past experiences, especially traumatic occurrences experienced throughout their own childhood. Research has discovered that a woman's negative mental state during and post pregnancy can be exacerbated if they've had negative childhood experiences (Dosanjh et al., 2023; Lippard & Nemeroff, 2023).

The World Health Organization (2019) found that worldwide, 10% of pregnant women and 13% of women in the postpartum phase have reported experiencing a mental health disorder. Additionally, data collected from 2017-2019 by the Centers for Disease Control and Prevention (2022) indicated that negative mental health conditions contribute to 23% of maternal deaths, including suicide and drug overdose, making that the leading cause of maternal mortality in the United States. More so, while the maternal health crisis has significant impact across the nation, data collected from 2018-2021 details the increase in maternal mortality in more vulnerable populations of minority groups who may not receive adequate health care services (Hoyert, 2023).

The Centers for Disease Control and Prevention (2024) reports that one in eight new mothers report symptoms of postpartum depression. Additionally, out of about four million annual live births in the United States, roughly 600,000 women experience perinatal depression (Mental Health America, 2024). Moreover, Mental Health America (2024) also found that women with a history of mental health challenges were 30% - 35% more likely to develop perinatal mood and anxiety disorders (PMADs).

PMADs, which have been identified as one of the most common complications of pregnancy (Hernandez, 2022), can be triggered by adverse childhood experiences (ACEs). ACEs such as abuse, neglect, and household dysfunction (Webster, 2022) can have a lasting impact on the woman as she navigates through motherhood, and in turn, result in the development of one or more presentations of PMADs. Consequently, an unhealthy mental state can cause a physical and emotional barrier between the mother and child, preventing a secure attachment from being formed between the two, and impacting the child's emotional development (Bosmans, 2022).

Significance to Occupational Therapy

Motherhood is not only a role that a woman assumes, but it is also an aspect of identity, and an occupation. The *Occupational Therapy Practice Framework* (OTPF), 4th edition (AOTA, 2020, herein referred to only as OTPF) presents instrumental activities of daily living (IADLs) such as child-rearing, caring for others, home management, meal preparation, and shopping (American Occupational Therapy Association, 2020), which are a few occupations that have specific applications to motherhood. When a mother's mental health is negatively impacted, difficulties may arise when engaging in the occupations that come along with that role. A study conducted by Balbierz et al. (2015) discovered how mothers suffering from depression may be less likely to follow precautions to ensure the safety of themselves or their child/ren. Since occupational therapists address the mental, physical, developmental, and emotional needs of a person (American Occupational Therapy Association, 2020), these skilled professionals can play a significant role in maternal health by assessing barriers that cause occupational imbalance and providing interventions to promote improved engagement in meaningful occupations. Thus, promoting a healthier relationship within the mother-child dyad (Sepulveda, 2019).

Project Purpose

While there is growing research across various disciplines that assess various components of maternal mental health, there remains a gap in literature that thoroughly investigates how maternal ACEs are interconnected with PMADs, development of secure attachment, and the impact that maternal dysregulation can impose on their infant's development. This project aims to, (1) explore the connection between maternal ACEs, PMADs, attachment theory, and self/co-regulation, and how they collectively have an impact on the mother's ability to transition to and function within her maternal role, and; (2) create an educational artifact that educates other healthcare professionals on how the occupational therapy profession can positively impact the quality of life (QOL) and occupational engagement of the mother-baby dyad in light if these correlations.

Speculations

As it is understood that mothers with higher prevalence of ACEs will have increased experiences of PMADs, it is logically speculated that this would elicit a direct correlation to challenges engaging in meaningful occupations, resulting in emotional and physical strain within the mother-child dyadic relationship. It is hypothesized that in educating other healthcare professionals regarding the connection to occupational identity and the state of maternal mental health and the potential intervention strategies for improved regulation, we as a healthcare community will achieve better interdisciplinary collaboration and have positive impact upon the outcomes of the mother-baby dyad.

Project Objectives

The primary objective of this capstone project is to create a scholarly teaching that informs other members of the interdisciplinary healthcare team how to conceptualize the role of the occupational therapist in the practice realm of maternal mental health and the mother-baby

dyad. Learning objectives for viewing participants of the online course content are: (1) to educate how ACEs have a neurobiological on mental health [in general]; (2) develop a better understanding of the connection between ACEs and PMADs the transition to motherhood/perinatal women; (3) develop a better understanding of how PMADs impact pediatric development; (4) develop a better understanding of how maternal self-regulation is necessary for co-regulation with the infant; and (5) develop a better understanding of an occupational therapist's role in the maternal health space.

Literature Review

Attachment Theory

Attachment is a significant aspect of consideration for maternal health. Attachment theory (Bowlby, 1969) provides important insights to understanding the dyadic relationship of mother and baby. When developing the attachment theory in the 1960s, Bowlby (1969) described attachment as a connection between individuals and highlighted the significance of cultivating a bond between the mother and baby. Salem Press Encyclopedia (2023) explained how children's emotional bonds are formed depending on the type of relationship that is developed with the mother during infancy. When children are provided consistent support from the mother, they can develop secure attachment (Bowlby, 1969), which can lay the groundwork for positive socioemotional skills throughout life. According to Cherry (2023), securely attached children develop stronger self-esteem, tend to be more independent as they grow older, and develop healthy social relationships with others. Conversely, Bosmans and colleagues (2022) noted how insecure attachment can develop if a child does not consistently receive support from their mother, storing these experiences into their Internal Working Models (IWM) (Bowlby, 1969) and struggling with finding a balance within their attachment relationships with mom and

others (Bosmans et al., 2022). Consequently, the inability to form a deep bond secondary to insecure attachment can be carried into adulthood and interfere with the cultivation of a bond between the mother-child dyad and others.

Adverse Childhood Experiences

ACEs have a substantial impact on maternal health. The ACEs checklist outlines traumatic childhood events such as abuse, neglect, and family function that could pose a negative impact on how a person navigates adulthood (Webster, 2022). Through 10 questions, Webster and colleagues (2022) were able to connect the exposure to childhood traumas to increasing health risk factors in adults, as more than four ACEs showed 12 times higher occurrence of depression and suicide (Felitti et al., 2019). Along with a decline of mental health, Felitti and colleagues (2019) also highlighted the significant relationship between higher incidence of ACEs and physical conditions, sometimes with skeletal and liver issues presenting themselves later in life.

As a woman transitions into motherhood, her memories and experiences of childhood can become a constant presence of repetitive and ruminating thought patterns, resulting in emotional, mental, behavioral, and physical stressors. Research shows that a woman's childhood experiences can impact her infant's emotional, behavioral, and neurobiological development (Uy et al., 2023). Hendrix et al. (2021) discovered when mothers suffer from depression due to childhood traumas, they're likely to negatively influence brain outcomes in infants, as evidenced by lower cortical gray matter, stronger bilateral amygdala, and greater amygdala volumes, resulting in cognitive and emotional regulation difficulties. Additionally, Zhang et al. (2021) reported that children exposed to mothers with a history of childhood abuse and perinatal depression, result in social issues as well. The connectedness of maternal mental health and the

child's frontoamygdayla allowed Bouvette-Turcot and colleagues (2020) to discover how increased maternal childhood adversities negatively impact the child's ability to regulate emotionally and behaviorally. Furthermore, maternal ACEs can potentially lead to the infant child developing poor self-esteem throughout their life span (Berber Çelik & Odacı, 2020).

Perinatal Mood and Anxiety Disorders

The perinatal period can be accompanied by mental health challenges in mothers. According to Hernandez et al. (2022), PMADs are the most common complication in women during and post pregnancy. One source showed about one in five perinatal women were diagnosed with a mood or anxiety disorder in the United States (Minnesota Department of Health, 2023). Hernandez and colleagues (2022) showed strong correlations to how exposure to childhood traumas can contribute to adverse mental health conditions as an adult, finding that women who reported PMADs experienced a higher rate of ACEs.

PMADs comprise a range of diagnoses that can include anxiety, bipolar disorders, psychosis, depression, obsessive-compulsive disorder, and post-traumatic stress disorder (Minnesota Department of Health, 2023). PMADs disrupt the transition to motherhood, as it negatively impacts the mother and the child. The high prevalence of perinatal depression (Molenaar et al., 2023) may have lasting effects on the mother and child (Lomonaco-Haycraft et al., 2019) and can result in low birth weight and adverse fetal neurodevelopment when experienced in gestation (Taiwo et al., 2024).

Regulation

Planalp et al. (2022) describes self-regulation as "a multidimensional construct comprising cognitive (executive function and attention), emotional (emotion regulation and effortful control), and behavioral domains" (p. 713). When a mother can self-regulate, she

exhibits the ability to manage her behaviors and emotions effectively. On the contrary, maternal dysregulation occurs when the mother has difficulty managing her emotions and behaviors, which can impair co-regulation with the child (Schwarze et al., 2024). A study conducted by Ionio and colleagues (2023) found that women with increased negative thoughts significantly impacted their infants' social and emotional development, as they exhibited decreased interaction with the parent via signs of withdrawal and less engagement. When mothers are regulated, they provide a sense of security to the child that allows them to learn how to regulate their emotions (Schwarze et al., 2024). However, if the mother is dysregulated, there will be decreased co-regulation between her and the child which can result in the mother feeling less validated in her role, and in turn fuels the decreased interaction and attachment between the mother and child. Research also discovered that maternal regulation could impact the infant's self-regulatory abilities during pregnancy (Schwarze et al., 2024). This may be in part due to the direct connection that the fetus has to the mother via the placenta (Van den Bergh et al., 2020), which exposes it to the maternal stress hormones and can impact their brain functions that influence self-regulation (Provencal et al., 2020). Therefore, the quality of maternal self-regulation is important, as it significantly impacts the development of effective and healthy self-regulation in the child (Planalp et al., 2022).

Role of Occupational Therapy

As members of the interdisciplinary team, occupational therapists can support women transitioning into motherhood (Baker et al., 2024) through a holistic approach. OTs can assess the social, personal, and environmental factors that influence a mother's ability to engage in meaningful occupations and provide skilled interventions to promote improved occupational engagement and active regulation strategies.

Occupational therapists who specialize in sensory processing can play a pivotal role in assisting women navigate the demands of motherhood by helping them develop strategies to promote self-regulation (Whitney, 2020). Although other professions may address an occurring issue through cognitive-behavioral modalities (Yisma et al., 2024), the underlying sensory processing challenges that can exacerbate the symptoms may not be explored. Therefore, it is important for OTs to work alongside other healthcare professionals to provide a comprehensive approach to support mothers in need.

Therapeutically addressing maternal health can promote improved well-being for the mother and the child, thus helping with the cultivation and nurturing of the mother-child dyadic relationship. Occupational therapists' client-centered approach ensures mothers are equipped with the tools to have occupational balance and be aware of the ever-changing needs that accompany the journey of motherhood. Since occupational therapists already provide therapeutic services to the early intervention population (Sepulveda, 2019), they are more than equipped to address the needs of the maternal population since maternal health significantly impacts the relationship between mother and baby.

For occupational therapists to understand the needs of the maternal population and how to best address their challenges, the necessary amount of continuing education should be accumulated. Pursuing continuous education specific to maternal health will ensure that occupational therapists understand the complexities of the maternal health landscape. OTs are eligible healthcare professionals who may seek out a certification in Perinatal Mental Health (PMH-C) as offered by the international organization Postpartum Support International. To effectively serve the maternal population, specialty ongoing education is vital to ensure proper

efficacy of care and consideration to upholding of the standards as outlined by the governing bodies.

Occupation-Based Models/Frame of Reference

The Person-Environment-Occupation (PEO) framework assesses the interaction between the person, environment, and occupation and their impact on occupational performance (Law et al., 1996). Motherhood is a role that is comprised of varying demands that are impacted by differing contexts, which influences occupational performance. The PEO framework allows for assessment of physical, social, and cultural factors (Law et al., 1996) that influence a mother's ability to engage in occupations that are meaningful to her (Sepulveda, 2019).

The Life Balance Model (LBM) focuses on the patterns to enable healthy, sustainable, and meaningful engagement in occupations (Matuska, 2012). Implications of this model include meeting basic health and safety needs, having healthy relationships with others, feeling capable and competent when engaging in tasks, and creating positive individuality (Matuska, 2012). When a mother can engage in the various occupations that are necessary and meaningful to her and her child, this model theorizes that life will be perceived as more satisfying and balanced.

The Model of Human Occupation (MOHO) examines the occupational shifts that occur when individuals interact with the environment, with the assumption that occupational engagement is the primary goal of humans (Kielhofner & Burke, 1980). This model consists of three subsystems: volition (motivation), habituation (behavior), and performance (skills), which enable individuals to engage in roles and habits that help shape their identity (Kielhofner & Burke, 1980). Kielhofner and Burke (1980) reports that volition is comprised of personal causation, which is belief in effective performance, interests which include desire to obtain pleasure from actions, and valued goals which are how people measure the importance of

behaviors. Additionally, Kielhofner and Burke (1980) explained how habituation includes internalized roles which impact automatic routines, and habits which occur after repeated occupational engagement. Lastly, performance is noted to be comprised of skilled action (Kielhofner and Burke, 1980). This holistic model enables practitioners to evaluate the mother's occupational participation and performance and enables them to understand the occupational shifts that occur within the maternal transition.

Dunn (1997) suggests that there is a relationship between an individual's neurological processes and their displayed behavior/ ability to self-regulate. Dunn's Model of Sensory Processing proposes four patterns of sensory processing which are categorized based on an individual's neurological threshold and self-regulation abilities (Dunn, 2007). Dunn (2007) explains the importance of neurological thresholds to the nervous system construct, as it aids in understanding sensory processing. Since individuals possess differing thresholds, various amounts of input can activate the nervous system and evoke a response (Dunn, 2007). Additionally, the behavioral construct of self-regulation is on a continuum where at one end are individuals who utilize a passive strategy (remaining in an overstimulating environment, and then negatively responding), while the other end are individuals who utilize an active strategy (manipulate themselves or the environment to control the received input). Therefore, the intersection of the neurological threshold and self-regulation produces the four patterns (Figure 1): sensation seeking, sensation avoiding, sensory sensitivity, and low registration (Dunn, 1997.). Dunn (2007) explains the patterns as follows, (a) "sensation seeking, which represents high thresholds and an active self-regulation strategy; (b) sensation avoiding, which includes low thresholds and an active self-regulation strategy; (c) sensory sensitivity, which includes low

thresholds and a passive self-regulation strategy; and (d) low registration, which represents a high threshold and a passive self-regulation strategy." (p. 85).

	Behavioral Response / Self-Regulation	
Neurological Thresholds	Passive	Active
High Threshold	Low Registration	Sensation Seeking
Low Threshold	Sensory Sensitivity	Sensation Avoiding

Figure 1. Relationship between neurological thresholds and behavioral responses.

The transition to motherhood can be significantly dysregulating from a sensory processing perspective since there are changes that occur internally and externally, ranging from hormonal fluctuations, sleep deprivation, bodily changes, and increased caregiving responsibilities. In turn, these changes can lead to sensory processing challenges that may result in increased stress and anxiety. Therefore, it is vital that mothers develop and utilize tools and strategies to promote self-regulation, so that they can cope with the demands of motherhood.

Link to Occupational Performance

Occupational performance in motherhood is directly impacted by the woman's ability to self-regulate enough to engage in her daily roles and responsibilities. Caring for the home and the baby are IADLs (American Occupational Therapy Association, 2014) that are typical occupations which hold meaning to mothers and can contribute to the positive attachment and

bonding with the baby. When a mother is regulated, then co-regulation is more likely to be achieved, thus promoting optimal attachment and development of the baby (Lavelli et al., 2019).

However, research has shown that when women have experienced multiple ACEs, her transition into the motherhood role can be riddled with complications that can lead to PMADs (Felitti et al., 2019) and decreased attachment with the baby, which can negatively impact the child's development (Uy et al., 2023). Therefore, creating an increased awareness across disciplines pertaining to self-regulation strategies and the impact of sensory processing feedback loops in the nervous system are essential to improve positive transition to the role of motherhood and better support the mother-baby dyad in this window of infant development. Helping mothers understand how past experiences can impact their ability to effectively perform occupations within their maternal role and providing them with strategies to promote self-regulation when dysregulated, will promote positive relationship with self and others.

Methods

Deliverable

For this capstone project, a scholarly teaching was created via an educational video, with the intent that provided content will be directly consumed by key stakeholders, which are professionals who work with the maternal and/or early intervention population (i.e. psychologists, social workers, obstetricians, midwives, pediatricians, lactation consultants, doulas, physical therapists, and occupational therapists). A total of 23 professionals viewed the 23-minute educational artifact, which was created using PowerPoint and broadcasted as a digital product on YouTube (Appendix 1 details a general outline of the educational artifact). During Zaila and colleagues' (2020) studies, they found that YouTube had shown to be an effective streaming site to share health related educational videos. For decades, research has been

conducted to identify the accurate amount of time that a person should spend viewing an online educational artifact, and more current research has concluded that individuals typically present with a 15-to-25-minute attentional threshold before they begin to disengage (Nielsen, 2020; Litton, 2021). Therefore, compiling content into an educational video less than 25 minutes in length will hopefully promote sustained attention throughout its entirety, especially if the topic is of interest to the participants (Litton, 2021).

Additionally, past research studies have also been a guiding factor in choosing an online asynchronous platform to distribute the deliverable to the participants. Since many adults have busy schedules that may prohibit them from attending an event on a prescheduled day and time, asynchronous online learning allows them to access information at their own time and pace (Zeng & Luo, 2023). Saudi (2021) explained how online asynchronous learning is beneficial because individuals can engage without being hindered by a specific time or location where the information must be consumed. Adults are equipped with the ability to be self-directed learners, and when topics are relevant to their lives, then they possess the internal motivation to effectively receive the information being distributed (Yarbrough, 2018). An online deliverable can also be beneficial because it reduces the costs that may be required if the information were distributed in person (Garrood et al., 2023), since costs can quickly accrue if a venue needs to be rented by the educator or money is required for participants to travel to the location to receive the information. The flexibility of learning asynchronously online allows consumers to decide the most comfortable place for them to learn, thus promoting increased engagement and attention (Molefe et al., 2022).

Participant Recruitment

Multiple recruitment methods were utilized to encourage individuals to engage in the online educational video. Advertisements on social media platforms such as Facebook and Instagram were distributed weekly via personal and business accounts. Additionally, flyers were made and handed to staff members in obstetrician offices, pediatric doctors' offices, midwifery facilities, and doula facilities that are in various Georgia cities (i.e. Snellville, Lilburn, Grayson, Loganville, Lawrenceville, Stone Mountain, and Tucker).

Inclusion criteria for participation in this capstone project include professionals who currently work in the maternal health field with treatment history of perinatal and postpartum women. Professionals who work directly with the early intervention population and indirectly with mothers were also included. Professionals of varying disciplines and educational backgrounds were encouraged to participate, but the primary language of all participants must be English, since that is how the information will be communicated.

Method & Measure

To assess the effectiveness of the online asynchronous – scholarly teaching video, a pre and post survey will be provided to the participants. A pre-survey will obtain the participants' current knowledge pertaining to the topics of ACEs, PMADs, and Attachment Theory, creating a baseline when measuring the knowledge that was gained after watching the video (A brief guide to selecting and using pre-post assessments, n.d.). Stantcheva (2022) explained how the pre and post surveys should be identical so that there is no error when measuring the effectiveness of the educational tool. In addition to measuring the effectiveness of the educational material, pre and post surveys are valuable because the participants' responses will allow the administrator to make necessary changes to the content that is being delivered (A brief guide to selecting and using pre-post assessments, n.d.). A study conducted by Worobey and colleagues (2022)

demonstrated how pre and post methods can adequately measure the learning outcomes when providing asynchronous online education to adults.

After providing agreement to participate, the professional will be emailed a link to access Google forms, where they will answer six preliminary questions (see Appendix 2), and the five-item pre-survey which will assess their current knowledge of how the topics are interconnected (see appendix 3). Afterward, they will receive a link to the 23-minute asynchronous educational artifact and will be asked to watch the video within 48 hours of completing the pre-survey. Once the participants finish viewing the educational video, they will be asked to immediately complete the post-survey (Appendix 3) so that the information is fresh in their minds.

To assess the effectiveness of the scholarly teaching, participants' responses on the pre-survey will be analyzed and compared to the answers on the post-survey. The five-point Likert scale that participants use to answer the questions will allow for the gathering of information (Kusmaryono et al., 2022), and assessment of the amount of knowledge that was gained about how ACEs, PMADs, and attachment are interconnected and how the motherhood transition is impacted.

Findings

Upon conclusion of the recruitment process, a total of 23 professionals engaged in scholarly teaching. A dissection of the participants' varying professions and frequency of encounters with the maternal population and the early intervention population is located below (Figures 2 - 4).

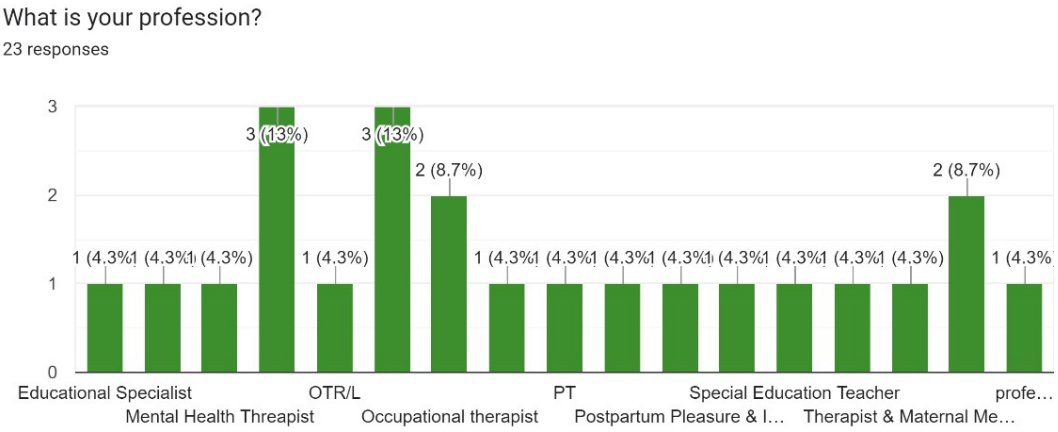

Figure 2: Profession of participants

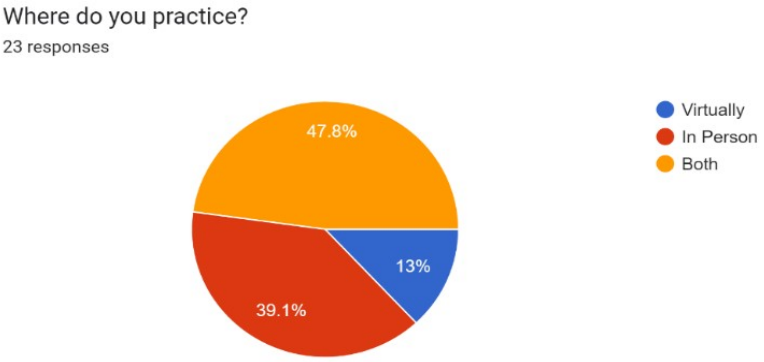

Figure 3: Practice settings of professionals

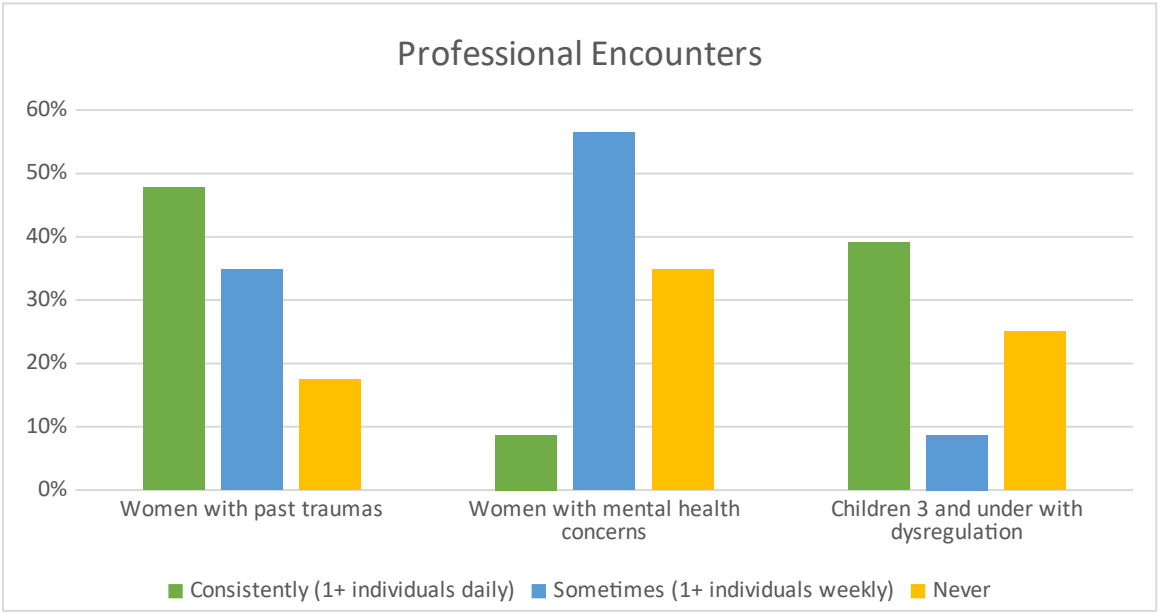

Figure 4: Professional encounters with the maternal and/or early intervention population

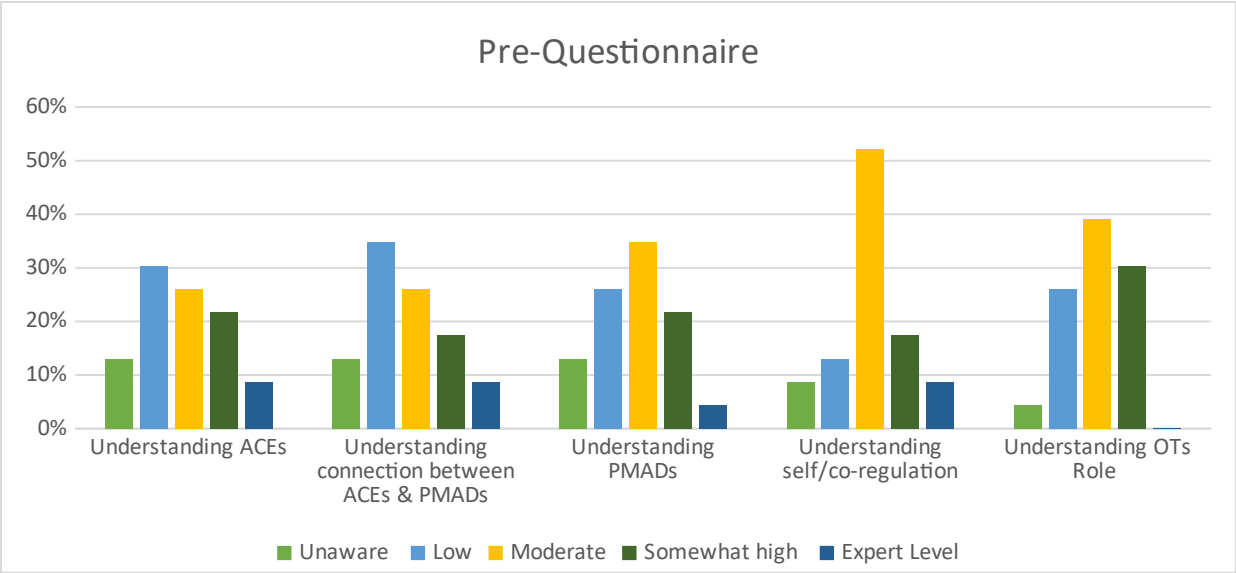

Figure 5: Feedback before viewing scholarly teaching

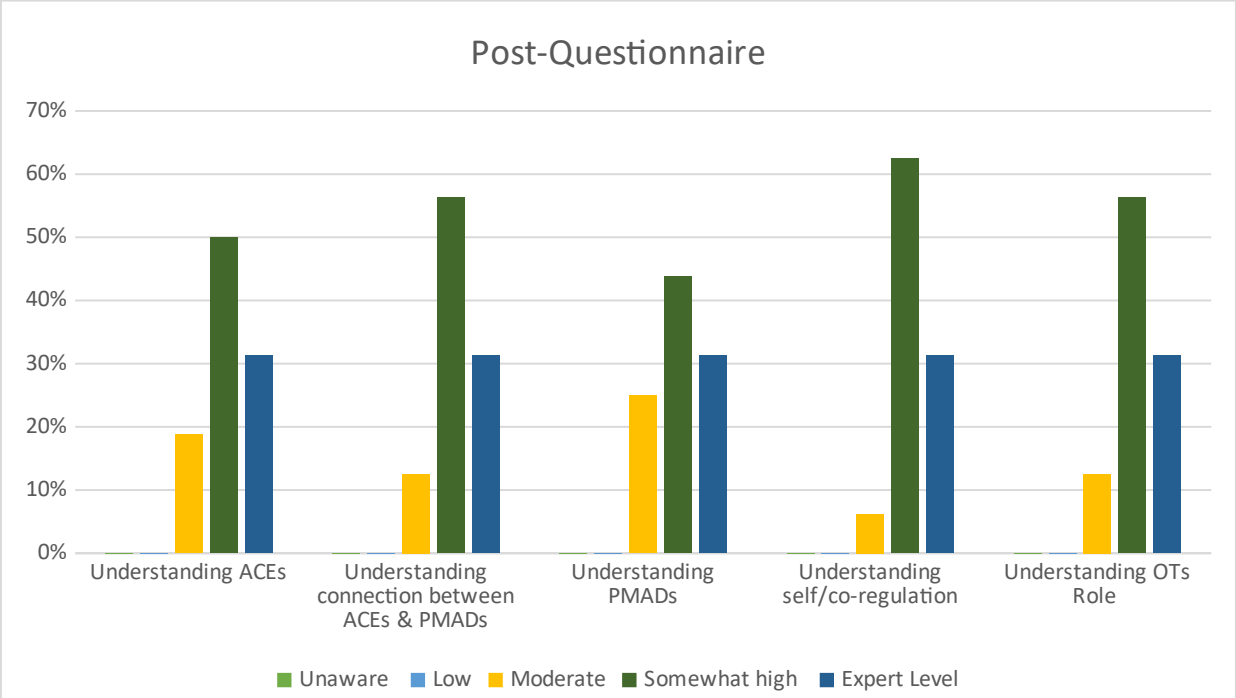

Figure 6: Feedback after viewing scholarly teaching

As charted above (Figure 5), on the pre-questionnaire, 13% of participants were unaware of what ACEs were, 30.4% had low understanding, 26.1% had moderate understanding, 21.7% had somewhat high understanding, and 8.7% had a high level of understanding what ACEs were.

Next, 13% of participants were unaware of the connection between ACEs and PMADs, 34.8% had low understanding, 26.1 % had moderate understanding, 17.4% had somewhat high understanding, and 8.7% had expert understanding of the topic. Then, 13% of participants were unaware of what PMADs were, 26.1% had low understanding, 34.8% had moderate understanding, 21.7% had somewhat high understanding, and 4.4% had expert understanding of the topic. Additionally, 8.7% of participants had no understanding of maternal regulation or co-regulation, 13% had low understanding, 52.2% had moderate understanding, 17.4% had somewhat high understanding, and 8.7% had expert understanding of the topic. Lastly, 4.4% of participants were unaware of how occupational therapists can professionally support the maternal population, 26.1% had low understanding, 39.1% had moderate understanding, 30.3% had somewhat high understanding, and 0% had expert understanding of the topic.

As graphed above (Figure 6), on the post-questionnaire, 0% of participants were unaware of what ACEs were, 0% had low understanding, 18.8% had moderate understanding, 50% had somewhat high understanding, and 31.3% had a high level of understanding what ACEs were. Next, 0% of participants were unaware of the connection between ACEs and PMADs, 0% had low understanding, 12.5% had moderate understanding, 56.3% had somewhat high understanding, and 31.3% had expert understanding of the topic. Then, 0% of participants were unaware of what PMADs were, 0% had low understanding, 25% had moderate understanding, 43.8% had somewhat high understanding, and 31.3% had expert understanding of the topic. Additionally, 0% of participants had no understanding of maternal regulation or co-regulation, 0% had low understanding, 6.2% had moderate understanding, 62.5% had somewhat high understanding, and 31.3% had expert understanding of the topic. Lastly, 0% of participants were unaware of how occupational therapists can professionally support the maternal population, 0%

had low understanding, 12.5% had moderate understanding, 56.3% had somewhat high understanding, and 31.3% had expert understanding of the topic.

Discussion

According to the results from the pre and post questionnaire, participants gained knowledge of ACEs, PMADs, maternal regulation, and co-regulation. Feedback also indicates that participants have a better understanding of the role that occupational therapists play within the maternal health space. Participants were asked to leave written feedback about the educational artifact, and a few professionals stated:

> *"This was very informative. As a license mental health therapist, I was about to refresh information about the impact of ACE on PMAD and infants. I also learned more ways OT are about to support mothers."*
>
> *"Your presentation was very information and congruent to trainings and research that I have encounter on this journey as well with maternal mental health. I can confidently connect the relatability of impact an OT can have in maternal mental health circle of care sensitivity. Co-regulation was a great addition and support to attachment styles."*
>
> *"This presentation was very informative and helped me to understand importance of co-regulation for both the mental and physical health of a mom and her child. I am also more informed about the importance of the role the OT has in helping mothers and their children during the maternal journey."*
>
> *"You did an amazing job and breaking down and explaining ACEs and PMADs in postpartum women. I learned a few new things. Thank you!"*

Through the feedback provided from the professional participants, it is evident that the scholarly teaching provided a great deal of information that was easily digestible and promoted better understanding of the discussed topics. As the awareness of these topics and the expertise that

OTs can contribute to the maternal health field improves, it will result in increased interdisciplinary collaboration, thus promoting comprehensive care of women in need.

Limitations

Although the recruitment process was composed of various methods to obtain content viewers, there were a limited number of professional viewers, and their feedback may not be representative of a larger population. Another limitation of this project was non-response bias. Although there were 23 participants who took the pre-questionnaire, there were only 16 participants who took the post-questionnaire, ultimately leading to less comprehensive insight, which does not accurately reflect the entire impression of the audience's content feedback. Furthermore, the time frame provided to engage in this scholarly teaching may have been limiting, as it only captured a snapshot of a larger impact of learning.

Implications/Future Considerations

Exploring and understanding the connection between ACEs, PMADs, attachment theory, and maternal regulation can significantly impact research and practice. When a professional has an accurate awareness of how ACEs influence the mother's mental health during the transition into and throughout motherhood, insight can be provided into potential risk factors and pathways for intervention. Additionally, developing a comprehensive understanding of how the mother's mental health impacts the dyadic bond with the child and its healthy development, will prompt professionals to implement holistic interventions that are individualistic to the mother's unique needs, thus promoting improved quality of life for the mother and child.

Further research with controlled IRB parameters on this topic is warranted to obtain a broader scope of the foundational knowledge that other professionals possess about ACEs, PMADs, attachment theory, and regulation, as well as to provide insight on how valuable the

occupational therapy professional can be within the maternal health space. As the understanding of these topics grows across professions, increased interdisciplinary collaboration might result, and improved maternal well-being and healthy child development may ensue.

Conclusion

The research found on attachment theory, adverse childhood experiences, perinatal mood and anxiety disorders, and regulation have demonstrated a complex web of interconnections that result in a lasting impact on the dyadic bond of the mother and the child. Cited studies highlighted the significance of higher prevalence of ACEs in women and how they can predispose them to mental health difficulties later in life (Atzl et al., 2019) and disrupt the formation of secure attachment between the mother and child (Bosmans et al., 2022).

This project set out to deepen the understanding of the influences on the maternal transition and identify an intervention framework that can be provided to mothers who wish to overcome performance patterns related to experiences of childhood traumas, which negatively impact their occupational and co-occupational engagement associated with motherhood. While gaps remain, it is imperative that mothers receive mental health support so that adverse outcomes for her and the child can be mitigated, and barriers that impact occupational performance can be recognized and addressed with evidence-based interventions.

When PMADs go untreated, the entire familial unit is affected (Slomian et al., 2019). Therefore, it's crucial for occupational therapists to provide holistic maternal support that can help with the ease of transitioning into motherhood as the earliest form of early intervention. Since the well-being of a mom and her child are interconnected, improving maternal health will, in turn, enrich the bonding and attachment that is necessary for adequate infant development.

Appendix 1

**General format of online asynchronous scholarly teaching*

Introduction
Discussion of ACEs *- what are they?* *- do we all have them?* *- how does that impact motherhood?*
Discussion of PMADs *- what are they?* *- how do I know if I have one?* *- who is more susceptible to developing one?* *- how does that impact motherhood?*
Discussion of Attachment Theory *-what is it?* *-what impact does is have on mother-child dyad* *-what impact does it have on child development*
Discuss importance of self-regulation and impact on ability to co-regulate with baby *-what does dysregulation look like?* *-how does dysregulation impact occupational performance?* *-strategies for maternal regulation and co-regulation*
Discuss the role of occupational therapy in maternal health.
Provide resources for mental health assessments and ACEs checklist

Appendix 2

1. What is your profession?
2. Where do you practice?
3. What is your highest obtained degree?
4. Weekly, how often do encounter women with past traumas while working? (“consistently”, “sometimes”, “never”-)**
5. Weekly, how often do you encounter women with perinatal or postpartum depression while working? (“consistently”, “sometimes”, “never”)**
6. Weekly, how often do you encounter children under 3 years old with decreased regulation while working? (“consistently”, “sometimes”, “never”)**

** “consistently” - at least 1 or more individuals daily

**“sometimes” - at least 1 or more individuals weekly,

Appendix 3

**Please answer the following questions on a 1-5 scale indicating your level of confidence in relationship to the topic in question:*

1 = none (unaware of this topic), 2 = low, 3 = moderate, 4 = somewhat high, 5 = high (expert level)

1. How would you rate your confidence in understanding the impact of Adverse Childhood Experiences (ACEs) on maternal mental health and the transition into motherhood?
2. How would you rate your confidence in understanding the connection between Adverse Childhood Experiences (ACEs) and Perinatal Mood and Anxiety Disorders (PMADs) in perinatal and postpartum women?
3. How would you rate your confidence in understanding the impact of Perinatal Mood and Anxiety Disorders (PMADs) on pediatric development?
4. How would you rate your confidence in understanding maternal self-regulation and co-regulation strategies within the mother-baby dyad?
5. How would you rate your confidence in understanding of the role of occupational therapy within the maternal health field?

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