Emotional Dysregulation in ASD/ADHD, and the Impact of Comorbidity

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Emotion regulation (ER) is the ability to manage and control one's emotions to adapt to internal and external changes in the environment. It involves the use of techniques and strategies that individuals use to control the duration and intensity of the expression of their emotions. The role of ER in a person's daily life is crucial for personal well-being, social relationships, and cognitive function.

Effective ER aid with coping with stress, reducing the impact of anxiety and depression. It also plays an important role in relationships by allowing individuals to communicate their emotions effectively, reduce the occurrence of conflict, and empathize. In decision-making, effective ER enables individuals to reduce the influence of intense emotions on reasoning and judgment, along with fostering a rational decision-making process. Academic and professional success is also impacted through enabling efficient stress management, staying focused, and task performance related to cognition and attention. Overall, effective ER is the key to managing external and internal tasks that require understanding and regulating emotions (Martin and Ochsner, 2016). Understanding the importance of effective ER allows for comprehending just how challenging ineffective ER can be. Emotional dysregulation (ED) is the opposite of effective ER and makes an individual face difficulty in various aspects of their life.

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that impacts both children and adults. Those with ADHD have difficulties paying attention and controlling impulsive behaviors. This disorder impacts daily function and development in school, work, and relationships. Most importantly, those with ADHD also struggle with emotional regulation (CDC, 2022). Another disorder impacted by emotional dysregulation affecting developmental disability is Autism Spectrum Disorder (ASD). Individuals with ASD frequently encounter challenges in social communication and tend to exhibit repetitive behaviors and narrow areas of interest. Due to ASD being on a spectrum, those with the disorder display different symptoms and are impacted differently (CDC, 2022).

The comorbidity between ASD and ADHD is a popular interest in research. The relationship between these two disorders is complex and not completely understood. Although there are separate diagnoses, there are many overlaps between the two disorders that justify some relationships. Many studies have presented a significant number of children who meet the criteria for ASD also meet the criteria for ADHD and vice versa. Approximately 30-80% of children with ASD have ADHD, while 20-50% of those with ADHD also have autism. Generally, both disorders have overlapping symptoms such as delays in language, heightened sensory responses, difficulties with ER, along with planning and inhibiting behaviors. Interestingly, genetic studies have identified common risk factors between ASD and ADHD. Although the specific genes differ between individuals, if an individual has relatives that have either ASD or ADHD, they have a higher risk of having both conditions. Although there may be shared behaviors in ADHD and ASD, there are underlying mechanisms that differ to elicit the same response (Rusting, 2018).

The aim of this paper is to delve into how both disorders independently impact ER, and how they interact when comorbid to better understand the relationship and influence of ADHD and ASD on individual lifestyle and function.

Emotional Regulation with ASD

Mazefsky et al. conducted a review on previous literature to determine the influence of ASD on ER. They found that individuals with ASD have an impaired ER abilities compared to neurotypicals. From experiencing difficulties in effectively modulating their emotional responses to maladaptive coping strategies, those with ASD have a difficult time effectively modulating their emotional responses leading to behavioral and emotional difficulties. Although they identified the issue, they found that the majority of the research focused on emotional experience rather than actual ER strategies and processes. Further, the small sample sizes used consistently throughout past research signifies the studies are not representative of the broader ASD population. The authors effectively highlighted the difficulties in understanding ASD with the kind of research that has been conducted to understand ASD emotional regulation (Mazefsky, 2013).

To understand the role of ASD on ER, Samson et al. recruited 31 individuals with ASD and 28 typically developing (TD) individuals through age and gender matching. The participants and their parents completed questionnaires to assess emotional experience, emotional regulation, and maladaptive behaviors. The study found that individuals with ASD experienced fewer positive emotions and more negative emotions compared to those that were TD individuals as reported by their parents. Yet, when assessing self-reported emotional experiences, there was no significant difference between ASD and TD participants. In the case of emotional regulation, it was found that those with ASD used cognitive reappraisal less frequently compared to TD individuals as reported by their parents and self-reports. There was no significant difference in expressive suppression between both groups. Parents reported, Individuals with ASD presented more maladaptive behaviors compared to TD individuals which consisted of higher levels of externalizing and internalizing behaviors. Individuals with ASD reported higher levels of negative emotion, and less use of cognitive reappraisal leading to higher levels of maladaptive behavior. These findings suggest interventions targeting cognitive reappraisal would be beneficial in improving emotion experience and reducing maladaptive behaviors in individuals with ASD (Samson, 2015).

To further analyze the research present on ASD and ER, Cai et al. analyzed literature focusing on children, adolescence, and young children. They found that individuals with ASD have difficulties with ER, are less effective with ER strategies, and present maladaptive strategy patterns compared to neurotypical individuals. The studies found less frequent use of adaptive ER strategies and more frequent use of maladaptive strategies in individuals with ASD. Further, co-occurring mental health conditions such as anxiety and depression are found to frequently occur in individuals with ASD (Cai, 2018). While there may be a hint of gender differences in emotion regulation among individuals with ASD, further studies would be required to examine these potential distinctions.

Samson et al. conducted another study analyzing parent interviews and children's daily diaries. The researchers included 32 individuals with AS and 31 that are TD. Parents of the participants were interviewed about their child's emotional experience using ten ER strategies. The participants filled out daily diaries about their experience and regulation of emotions. The data was analyzed using ANCOVAs and Full-Scale IQ. The study found that individuals with ASD experienced more anger and anxiety compared to TD individuals. ASD individuals use adaptive ER strategies less frequently and maladaptive strategies more frequently. Further, those with ASD were less effective with using ER strategies. These results were consistent with parent and self-report measures. This study provides an important understanding of ER in high functioning individuals with ASD. Future studies should replicate the study to find the effect on ER on various levels of ASD and conduct longitudinal studies for better understanding (Samson, 2014).

Looking into the ER strategies used for individuals in ASD, Mezefsky et al. sought to identify the importance of identifying ER and the deficits in individuals with ASD. The authors found that treatments beyond the use of Cognitive Behavioral Therapy (CBT), such as mindfulness, meditation, and acceptance-based approaches may provide those with ASD help with reducing the suppression feelings and develop strong adaptive regulatory strategies. For visual strategies, using The Incredible Five Point Scale would likely be an effective method to teach emotion skills to those with ASD. The authors further emphasize the need for accurate assessment of ER deficits in individuals with ASD and the development of measures that are sensitive to the needs of the population. Developing better measuring strategies would also provide benefit to gathering accurate data since self-report measures require understanding of emotions which may be difficult for those with ASD (Mazefsky, 2014).

Emotion Regulation with ADHD

To understand the ER deficits in adults with ADHD, Thorell et al. investigated using a newly developed self-rating instrument called the Comprehensive Emotion Regulation Inventory (CERI). This instrument consisted of seven sections that assessed different aspects of emotional regulation such as emotional reactivity, strategy usage, implementation difficulties, and the negative impact on daily life. The results presented the CERI to be a reliable and valid instrument for assessing emotion regulation issues in adults through the distinguished identification of emotional regulation, good test-retest reliability, and internal consistency. Significant group differences were found in adults with ADHD compared to the healthy individuals in the control group. Those with ADHD used certain strategies less often, experienced more implementation difficulties, and more negative impact on daily life. Yet, there were no significant differences in the use of suppression. For future studies, the shared and specific aspects of ER in different mental disorders should be compared with ADHD. Studying the differences between inattentive, hyperactive, and combined ADHD may provide valuable insights into if ER differs between the subgroups of ADHD (Thorell, 2020).

Groves et al. conducted a study to examine the relationship between executive function, ADHD, and ER in children. The sample included 151 children both with and without ADHD. Working memory was found to be significantly related to better emotion regulation and fewer ADHD symptoms. Inhibitory control and set shifting were not significantly related to emotion regulation or ADHD symptoms. Inattention and hyperactivity symptoms were both related to worse ER compared to those without ADHD. Working memory showed indirect effects on ER through ADHD symptom association. This study overall highlights the importance of working memory in both ADHD symptoms and ER skills which suggests that using working memory to target and improve ER in children may be an effective strategy. The study relied on parent reports which may not have identified the full range of emotional experiences if a self-report had been conducted. The inclusion of comorbidity was also limited, which may be a confound in the study. For future research, the study should incorporate self-report measures for cognitive behavioral strategies. Longitudinal studies would also provide a better understanding of the linkage between executive function, ADHD and ER from childhood to adulthood (Groves, 2021).

Another study conducted by Groves et al. investigated the role of working memory and ER in ADHD and neurotypical (ED) children. The study consisted of 145 children with ADHD, comorbid, and TD. All the children completed a comprehensive evaluation that included clinical interviewing and questionnaires. Working memory was conducted through neuropsychological testing. The study found better developed working memory was linked with better emotion regulation. Hyperactivity presented strong covariation with emotional dysregulation (ED), yet inattention symptoms did not predict ED. Overall the study provides evidence linking working memory and emotional regulation in children with ADHD. The role of hyperactivity is also highlighted as a mediator between working memory and ED. The limitations of the study include the use of cross-sectional design which limits the causality and directionality of effects. Additionally, the study consisted of children with ADHD which can't be generalized to the broader ADHD population. Future studies should delve into ER through more specific measures and determine the impacts of other executive functions on ER. Incorporating longitudinal and experimental studies would provide clearer effects (Groves, 2020).

Emotional Regulation with ADHD and ASD Comorbidity

Lizeta et al. reviews the current clinical on emotional, social developmental, and emotional intelligence of children diagnosed with ASD and ADHD. The authors also explore the use of AI as a therapeutic intervention for those with socio-emotional deficits with comorbid ADHD and ASD. The review of the research found that low levels of emotional intelligence are commonly found in those with ASD and ADHD. Emotional recognition deficits are a key feature of comorbid ASD and ADHD. The use of AI and social robots may provide aid in the development of social skills and emotional intelligence for those with ADHD and ASD. The use of this technology would provide individuals a controlled environment to practice social skills, improve emotional recognition leading to improvement in ER. Further research would need to be conducted to fully understand the effectiveness of the use of AI and robots. For future studies, studying the long-term effects of using AI and social robots for different age groups and levels of ADHD and ASD would provide a clear understanding of the impact of using these interventions (Bakola, 2020).

Jaisle et al. aimed to examine the relationship between ADHD and ASD symptoms with ED, and social competence in children. The study used parent reported measures to assess the constructs in a sample of children with and without ADHD and ASD. The results showed that all four ASD and ADHD symptom were significantly linked with ED and reduced social competence. Further, ADHD inattentive symptoms and ASD social communication / interaction symptoms directly predicted reduced social competence. ADHD hyperactivity symptoms and ASD restricted/repetitive behaviors indirectly predicted reduced social competence through their association with increased ED. These results suggest that emotional regulation plays a role in connecting ADHD and ASD to reduced social competence. The cross-sectional design may be a limitation in this study due to the prevention of causal relationships. The children in the studies were limited to level one and two ASD support which limits the generalizability of the findings. The parental report may have also introduced bias. Future studies should include longitudinal and experimental designs to establish a causal relationship. Using objective measures of social behavior may provide clearer results. Lastly, aligning measures with the DSM-5 for ASD and ADHD would increase the reliability and validity of the results (Jaisle, 2022).

Vaidya et al. used community detection and data classification to analyze data from two large cohorts of children with ADHD, ASD, and TD children. The participants completed parent-report measures of executive function (EF), and fMRI tasks were used to validate the findings. The study divided EF into three subgroups FLEX-MOT (flexibility and ER problems), INHIBIT (hyperactivity/impulsivity and inhibition issues) METACOG (working memory, planning, and organization deficits). Support vector machine learning model (SVM) was used to validate these subgroups and found high accuracy in predicting subgroup memberships. The results found that EF provided a distinct understanding of EF impairment in children with ASD and ADHD. Further, it highlighted the need for personalized treatment approaches due to the heterogeneity within EF categories. The study mainly relied upon parent-report measures of EF, which may not be effective at capturing the complexity of EF abilities. The sample also consisted of mainly males; thus, the generalizability is limited. For future studies, longitudinal studies should be conducted with balanced samples accounting for males and females and examining the EF subgroups over time. Deeper phenotyping with models such as Random Forest or Decision Trees may provide higher accuracy for EF subgroups (Vaidya, 2019).

Analysis

Overall, the studies cohesively provide evidence to provide a clear understanding for how the presence of ADHD compared to ASD and the comorbidity of each impact ER. There is evidence that although ADHD and ASD are two different disorders with their distinct symptoms, there are various similarities that amplify ED. From the synthesis of the past research, it can be concluded that the comorbidity of ASD and ADHD is not due to the interaction of the two disorders, but due to the overlapping nature of the symptoms, and the ER deficits present independently in each disorder in the first place. The hyperactivity/inattentiveness found in ADHD reduces the ability of an individual in identifying one's own emotions and emotions of others due to the lack of attention, combined with the difficulties in individuals with ASD in social communication leads to ER that is elicited due to the difficulties experienced in ADHD and ASD independently.

Conclusion

In conclusion, delving into the literature on ADHD and ASD, it is evident that the presence of ER in ADHD and ASD comorbidity is due to independent disorder difficulties. Individuals with either ASD or ADHD face challenges with respect to their independent symptoms, and the ER from both impact different areas of their life when comorbid. A common issue found in these studies is the limited measurement tasks. The use of parental reports makes it difficult to differentiate between external observation and internal difficulties with ASD. Conducting short term studies also makes it difficult to gain insightful results. Thus, for future studies, finding a way to conduct studies that measures emotional regulation experiences from the individual directly would provide better results. This could be achieved through longitudinal studies, and developing a closer relationship with the participants to understand their ER difficulties

since those with ADHD and ASD may find it challenging to identify their difficulties related to emotions during initial screenings and interactions.

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