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Do Resilience and Treatment Satisfaction Moderate the Association between ADHD and Quality of Life?

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Abstract

This study examined how resilience moderated the association between ADHD symptom severity and general Quality of Life (QoL) in emerging adults. Using data from an anonymous online survey distributed at six US colleges/universities, participants (N=4396; 73% female-identifying; 72% White) reported on ADHD symptomatology and their diagnostic status; resilience; perceived QoL; and satisfaction with pharmacological and behavioral treatment for ADHD (if diagnosed). As hypothesized, overall ADHD severity was inversely associated with the different facets of QoL (rs = -.18 to -.29). However, contrary to our hypothesis, inattentive symptoms showed larger inverse associations with QoL compared to hyperactive/impulsive symptoms. There was a significant interaction between ADHD severity and resilience on QoL ($p < .001$), with moderation analyses indicating that the inverse association between ADHD symptom severity and QoL was weaker among participants reporting higher family coherence, one of the four types of resilience examined. Resilience did not moderate the association between ADHD symptom severity and treatment outcome satisfaction; however, resilience did predict treatment satisfaction directly ($B = 0.2578$, $SE = 0.0722$, $t = 3.5726$, $p < .001$). Ultimately, these results support QoL being inversely associated with ADHD severity, resilience moderating this association, and underscores the protective role of familial cohesion in buffering the negative impact of ADHD symptoms on QoL.

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Contents

Do Resilience and Treatment Satisfaction Moderate the Association between ADHD and Quality of Life?

In the United States of America, 4% of adults and 6.6% of college students have a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) (DuPaul et al., 2022; U.S. Department of Health and Human Services, 2022). From 1997 to 2016, the prevalence of ADHD increased by 4.1%, indicating the necessity for research regarding the protective measures and risk factors associated with the disorder (Abdelnour et al., 2022).

To fully conceptualize the broad impact of ADHD on child, adult, and emerging adult populations, it is important to recognize the symptoms and characteristics associated with the disorder. Adult ADHD is characterized by impulsivity, disorganization, inattention, difficulty managing time, low tolerance for frustration, mood swings, and inability to cope with stress (Mayo Clinic, 2023). ADHD can be typed as combination (both inattentive and hyperactive presentation), inattentive (issues with maintaining attention, poor organization, inability to finish tasks, increased distractibility, and poor time management), or hyperactive/impulsive (behavioral issues, problems maintaining relationships, restlessness, excessive speaking, interruption) (Attention Deficit Disorder Association, 2023).

Further, ADHD impacts various populations differently. In children, the worldwide prevalence of ADHD is estimated at 7.2% (Thomas et al., 2015). In adult populations, for non-Hispanic white individuals, the prevalence of ADHD is 5.4% (U.S. Department of Health and Human Services, 2022). Conversely, the estimated prevalence in Hispanic individuals is 2.1%, and in non-Hispanic Black individuals, 1.9%. Males are significantly more likely to be diagnosed with ADHD than females (5.4% vs. 3.2%) (U.S. Department of Health and Human Services., 2022) (see Figure 1). Notably, non-Hispanic Black individuals are two and a half times

more likely to receive a diagnosis of conduct disorder than of ADHD, indicating a possible clinical bias that results in a lack of intervention and perpetuation of systemic biases (Fadus et al., 2020).

ADHD, regardless of subtype, can significantly impact Quality of Life (QoL), academic or professional achievement, and can increase risk for substance use or other risky behaviors. When considering academic performance in students with ADHD, there is evidence suggesting this population is at greater risk for poor academic outcomes and is less likely to complete undergraduate studies (DuPaul et al., 2022). Due to the increased disinhibition, individuals with ADHD exhibit greater engagement with risky behaviors, such as substance misuse, driving without seatbelts, and financial impropriety (Shoham et al., 2016). As such, the necessity for research into factors that are protective against these negative outcomes is of paramount importance.

One way to illuminate the impact of ADHD on individuals' lives is to examine the broad construct of quality of life (QoL). QoL refers to the propensity for positive outcomes relating to health, happiness, life satisfaction, personal relationships, and academic or professional success (Haraldstad et al., 2019). However, prior research into the relationship between ADHD and QoL largely has characterized ADHD as a risk factor for poor QoL, rather than investigating predictors of more adaptive functioning. Resilience also has not been examined as a potential moderator of the ADHD - QoL association (Mastoras et al., 2018; Wilmshurst et al., 2011). To that end, the current study examined protective factors, namely different forms of resilience, as potential buffers of the negative impact of ADHD on QoL. Additionally, we examined dimensions of resilience as potential moderators of the association between ADHD and treatment satisfaction, and the association between the ADHD subtype (inattentive versus hyperactive) and

QoL, as these topics have been relatively unexplored in the literature but could inform interventions that promote resilience and better QoL among young adults with ADHD.

Literature Review

Quality of Life and ADHD

Research into the relationship between QoL and ADHD illuminates the pervasive nature of the disorder and the significant impact that ADHD has on social, emotional, academic, and physical functioning. There is a plethora of research that demonstrates an association between the presence of ADHD and diminished QoL. Notably, most of these studies heavily focus on children, illuminating a deficit of adult-centric data (Wilmshurst et al., 2011).

ADHD and its associated symptoms can impact multiple domains of functioning, including social, emotional, academic, professional, and physical functioning. Symptoms of inattention can cause individuals to be unable to complete school or professional work, household duties, or sustain attention on things that are not of interest. Impulsivity in individuals with ADHD is associated with a greater prevalence of reckless driving, unsafe sex practices, substance usage, and other risk-taking behaviors, all of which may impact personal relationships and violate established social norms. Impulsive and hyperactive symptoms relating to outbursts, overtalking, or inappropriate and excessive movement further impact social, academic, and professional functioning (Ginapp et al., 2022).

ADHD also may experience impacts on emotional or physical functioning. Emotional dysregulation, sensations of agitation and anxiety, difficulty maintaining structure and routine, and feelings of disorganization can cause individuals to experience increased difficulty in functioning. The aforementioned challenges can cause individuals to have irregular patterns of eating or sleeping, and the emotional difficulties can strain self-image, self-esteem, and social

relationships (Ginapp et al., 2022). Adults with lived experience of ADHD report constantly feeling like they are strange or the ‘odd-one out’, feeling dissatisfaction with themselves or their lives, and feeling as if they are lazy or a constant failure, thus demonstrating the profound impact that ADHD can have on psychosocial functioning (Toner et al., 2006).

Child studies of ADHD suggest that the QoL of children with the disorder is significantly lower than children without ADHD symptoms (Kandemir et al., 2014; Lee et al., 2016). In a meta-analysis of nine cross-sectional studies of children aged 8 to 11 by Lee et al. (2016), utilizing the Pediatric Quality of Life Inventory (PedsQL), researchers found a negative and moderate impact of ADHD on emotional Health-Related Quality of Life (HRQoL) from the perspective of the child or adolescent. More specifically, ADHD had a moderate negative impact on physical HRQoL and a large negative impact on psychosocial HRQoL. Further, children with ADHD were more likely to exhibit sleep disruptions, difficulties related to socialization, and comorbid psychiatric and physical disorders (Lee et al., 2016).

When analyzing the more specific domains of QoL, a meta-analysis by Wanni Arachchige Dona et al. (2023) found that QoL reported by children with ADHD was consistently lower than that of controls. Specifically, the studies using the PedsQL revealed significantly lower scores in the school and psychosocial domains (including social, emotional, and school domains) among children with ADHD compared to those without ADHD. Notably, children receiving ADHD treatment showed higher QoL than those without treatment; however, even with medication, children with ADHD still exhibited lower QoL in the family domain than those without ADHD, and the overall impact of ADHD on child-reported QoL was characterized as "very large" for children with ADHD compared to those without ADHD (Wanni Arachchige Dona et al., 2023).

Taken together, the above research underscores that children with ADHD often experience lower QoL across multiple domains. Of note, studies have indicated that ADHD interferes with daily functioning in the lives of children to a more prominent degree than other chronic conditions such as asthma and incurs significant direct and indirect costs to social, fiscal, and emotional domains for the individual and family (Escobar et al., 2005; Hakkaart-van Roijen et al., 2007).

Adult studies of ADHD indicate that there is a discernible negative correlation between ADHD and QoL (Gjervan et al., 2014; Quintero et al., 2019). Gjervan et al. (2014), in a clinical sample of 149 participants (78 women; 71 men) ranging from 18 to 63 years of age, identified that ADHD Self Report Scale (ASRS) inattentiveness and ASRS hyperactivity/impulsiveness subscales negatively correlated with all mental component scales (vitality, social functioning, emotional functioning, and mental health) of the Medical Outcomes Study 36-Item Short Form Health Survey and with HRQoL. Quintero et al. (2019), in a cross-sectional study, noted that compared to a control group without ADHD (n=25), groups with ADHD (ADHD without comorbidity and without previous ADHD diagnosis n=31; ADHD with comorbidity and without previous ADHD diagnosis n=31; ADHD with comorbidity and with previous ADHD diagnosis n=29) exhibited a lower rate of employment and higher scores on all subscales of the Barratt Impulsiveness Scale (BIS-11). The severity of depressive symptoms was significantly lower in control subjects than in ADHD subjects, both with and without comorbidities. Owing to psychological dysfunction and disability, ADHD significantly impacts various dimensions of individuals' lives, including school performance, job success, social relationships, familial relationships, and romantic relationships (Quintero et al., 2019).

While there is a clear relation between ADHD and QoL, the aforementioned studies neglected to differentiate between the subtypes of ADHD and QoL. In the small body of literature investigating this association, Salvi et al. (2019), in a clinical sample of 60 participants (aged 18 to 65), showed that the hyperactive subtype of ADHD [as assessed with the Adult ADHD Quality of Life Questionnaire (AAQoL)], evidenced a stronger negative correlation with QoL, as compared to the inattentive subtype and combined subtypes. Moreover, the hyperactive subtype had the highest frequency of comorbid anxiety disorders and the greatest degree of impairment in personal relationships (Salvi et al., 2019). In a similar clinical study of 149 adults, comorbid psychiatric disorders were more prevalent in individuals with the hyperactive ADHD subtype (Millstein et al., 1997). As such, the subtype of ADHD might be associated with QoL to different degrees: particularly, the hyperactive/impulsive subtype may be correlated with increasingly negative QoL scores as compared to the inattentive subtype, though additional research is needed to investigate this association.

Resilience and QoL

While there is evidence suggesting the negative impacts of ADHD and other psychological disorders on QoL, there is relatively little research examining the role of mitigating or protective factors (Wilmshurst et al., 2011). One proposed protective element is resilience. Notably, resilience lacks consistent operationalization in psychological literature, though it is broadly regarded as the ability to adapt to significant sources of stress (Modesto-Lowe et al., 2011). Elements of resilience considered in the current study included *personal competence*, a measure of hope, determination, self-efficacy/esteem/liking, and life outlook; *personal structure*, identifying the individuals' ability to plan, organize, and maintain a routine; *social competence*, which encompasses social aptitude, positive disposition,

extraversion, communication skills and flexibility; *social support*, a measure of intimacy, external support, and the individuals' ability to provide support to others; and *familial cohesion,* which encompasses family support, cooperation, loyalty, stability, and conflict (Friborg et al., 2003).

As a buffer for QoL in the population more broadly, resilience has an apparent impact. To illustrate, in children, family resilience was associated with reduced emotional distress when faced with adversity, and an overall increase in the communication skills of the child. Additionally, high family resilience was associated with decreased prevalence of psychological disorders such as depression, anxiety, substance abuse disorder, and conduct disorder (Song et al., 2021). Song et al. (2021) established that the mere presence of risk does not automatically result in negative outcomes; instead, this relationship is moderated by elements of resilience. Additional literature asserts that there is a positive relation between resilience factors and QoL: essentially, the higher the proportion of protective resilience elements, the greater the QoL of the individual (Lawford & Eiser, 2001).

Cross-sectional research by Asma Noreen et al. (2021) provides further evidence of the role of resilience on QoL in adult populations. Analyzing medical students (high-stress level) and controls (low-stress level), psychological resilience was positively associated with improved QoL, thus demonstrating the necessity of resilience to moderate the negative impacts of stress and adversity (Asma Noreen et al., 2021).

Research related to ADHD specifically has suggested that college students with ADHD must have a high degree of resilience, which allows for adaptive behaviors in spite of the adversity these students might face while striving for academic success (Wilmshurst et al., 2011). Compared to control participants without ADHD, students with ADHD who were higher in

environmental mastery, an element of personal competence (Friborg et al., 2003; Wilmshurst et al., 2011), evidenced higher Total Self-Concept (TSC; TSC-II) scores. Students with ADHD rated friend-based support significantly lower than controls; instead, they rated familial (particularly paternal) support as the greatest element of support. This emphasizes the role of resilience in adaptation: despite having less friend-based support, students with ADHD consistently utilized alternative support systems. Notably, this study found no significant difference between students with and without an ADHD diagnosis regarding GPA, TSC, or Total Psychological Well-Being (PWB), perhaps further emphasizing the role of resilience in minimizing the negative impacts of adversity on QoL, though resilience should be further examined with regard to the direct impact on the aforementioned features (GPA, TSC, and PWB) (Wilmshurst et al., 2011).

In children with ADHD, there is a clear association between reduced resilience and negative outcomes in adolescence, such as academic struggles, diminished self-esteem, and the development of anxiety and depression disorders. Positive outcomes in this group were linked to factors such as social support, reinforcement of self-concept, self-worth, self-confidence, and lifestyle, fostering perceptions of competence in school, and social acceptance (Freire et al., 2021).

ADHD and Resilience in Children

The majority of studies that have examined resilience as a moderator of ADHD have focused on children. Ünver et al. (2022) showed that children with ADHD demonstrated lower levels of metacognitive awareness and emotional resilience compared to children without ADHD. Findings also indicated that emotional resilience increased with higher metacognitive awareness, while metacognitive awareness decreased with elevated ADHD, anxiety, and

depression. These results emphasize the need to promote coping and emotion regulation skills among children with ADHD, as this type of support may increase emotional resilience, and ultimately reduce adversity and behavioral challenges in children with ADHD (Ünver et al., 2022).

Additional research demonstrated that two key types of resilience, familial and social acceptance, were associated with better QoL among children with ADHD. Specifically, Dvorsky and Langberg (2016) identified the role of positive parenting, familial cohesion, and familial support in promoting positive adjustment for all children, regardless of the presence of ADHD symptoms. In children with ADHD, familial resilience buffered the severity of reported ADHD symptoms and was associated with better overall functioning. Social acceptance also was identified as a protective factor in this sample. Specifically, it was found to mitigate depression and aggression/conduct issues and positively impact grades and academic functioning for adolescents with and without ADHD, suggesting social acceptance is one key factor in promoting overall QoL (Dvorsky & Langberg, 2016).

Additional research found familial resilience to be a strong moderator of ADHD and QoL. Schei et al. (2015) found that family cohesion not only directly promoted adjustment but also mediated the relationship between ADHD symptom severity and quality of life in adolescents. Family cohesion was further identified as a mediator between self-reported emotional difficulties, conduct problems, and quality of life (Schei et al., 2015). Song et al. (2021) similarly identified family cohesion as an important protective factor for children in buffering the impacts of ADHD on QoL. This familial resilience was correlated with decreased emotional distress and behavioral issues, whilst promoting communication skills and other personal resilience elements (Song et al., 2021). It is unknown whether the associations between

familial resilience and emotional and behavioral outcomes would be similar for emerging adults with ADHD, however.

Resilience relating to personal competence and peer support were also identified as buffers against the negative impacts of ADHD on QoL (Mastoras et al., 2018; Modesto-Lowe et al., 2011). In a literature review of childhood studies of ADHD and resilience, self-perceived competence, both in academic and social domains, predicted better adjustment, improved childhood academic and social functioning, and decreased levels of depression and anxiety (Modesto-Lowe et al., 2011). Notably, when competence is overestimated, it is referred to as a "positive illusory bias", which may serve as a protective element for self-esteem, which is associated with better functioning (Modesto-Lowe et al., 2011), though the extent to which this bias is positive merits additional investigation as overestimation of competence can demonstrate poor metacognitive ability overall.

Social support was also associated with improved self-concept and psychological functioning, as well as other indicators of positive QoL outcomes, in a cross-sectional study of 55 school-aged children (Mastoras et al., 2018). The perception of support by children with ADHD had a greater association with QoL than objective support. Additional findings indicated that self-reliant behaviors were associated with greater parental support. Ultimately, this study, and that of Modesto-Lowe et al. (2011), departs from the deficit-based models of ADHD and QoL and evaluates the role of resilience and strengths-based models (Mastoras et al., 2018).

Taken together, these studies suggest that resilience can moderate the negative association between ADHD and QoL. Further, this suggests that a deficit model of ADHD does not serve to improve the outlook of individuals with the disorder. Child and adolescent studies of the

association of ADHD, resilience, and QoL demonstrate an important area for additional inquiry, and it is necessary to replicate these results in adult populations to determine generalizability.

ADHD and Resilience in College Students and Adult Populations

Literature investigating resilience as a moderator of the association between ADHD and QoL in adult populations is fairly limited and does not differentiate between the subtypes of ADHD. The extant research suggests that ADHD symptomatology is positively associated with perceived stress in college students; however, all the investigated resilience factors (social skills, social support, goal efficacy, and planning and prioritizing behavior) significantly mediated this association (Hamilton et al., 2021). This research provides a different perspective from prior research with children and adolescents, in that the mediational models suggest a mechanism (i.e., resilience) by which the impact of ADHD symptoms on stress levels is reduced.

In contrast to Wilmshurst et al. (2011), who contended that college-attending individuals with ADHD may be inherently more resilient than peers without the disorder, Hamilton et al. (2021) indicated that individuals with ADHD might be less resilient than those without ADHD. This merits further investigation with both populations of students, as it is possible that individuals with ADHD are not less resilient, but instead have greater resilience in some areas and less in other areas (Hamilton et al., 2021; Wilmshurst et al., 2011). In regard to college students, it has been suggested that elements of social and familial resilience can enhance QoL and academic success (Martin & Burns, 2014; Wilmshurst et al., 2011).

In a longitudinal study with a clinical sample, Schei et al. (2018) identified additional evidence pointing to the role of personal elements of resilience. Participants were approximately 15 years of age at the initial evaluation and were all transitioning to early adulthood through the follow-up period. Adolescents with ADHD who exhibited higher self-esteem and greater

personal structure experienced fewer challenges in psychosocial functioning over the three-year follow-up period. Further, adolescents with ADHD and higher self-esteem had decreased odds of developing depressive disorders during the follow-up period, while those with higher social competence had a decreased tendency to develop anxiety disorders (Schei et al., 2018). These findings underscore the significance of personal resilience factors as important moderators of QoL, as the findings indicate that higher levels of resilience predict better long-term outcomes.

ADHD Treatment Satisfaction

Research relating to treatment satisfaction in individuals with ADHD is fairly limited and is heavily focused on pharmaceutical-based interventions and parental perceptions of treatment satisfaction. In a questionnaire-based evaluation, ADHD symptom severity was shown to be an inverse predictor of pharmaceutical treatment satisfaction in child populations (6-17 years of age), as reported by parents and patients (Goërtz-Dorten et al., 2011). When considering modified-release methylphenidate (MPH-MR), a commonly prescribed stimulant medication demonstrated to improve QoL in children with ADHD, parent and patient treatment satisfaction increased with the length of use (Rothenberger et al., 2011). Adult patient satisfaction related to these interventions (Goërtz-Dorten et al., 2011; Rothenberger et al., 2011) does not appear to have been researched.

Research relating to psychological/behavioral intervention treatment satisfaction has been less explored, though available results indicate a high degree of overall treatment satisfaction. Andersen et al. (2022) evaluated adolescent participant satisfaction with group cognitive behavioral therapy (CBT) and found that overall satisfaction was high, with older age predicting greater satisfaction. Notably, this result does not appear to have yet been replicated with emerging adult or adult populations, illuminating the necessity for further investigation.

Ultimately, additional investigation is necessitated to determine why some individuals with ADHD report higher levels of treatment satisfaction, particularly in regard to the role of resilience as a moderator or predictor of ADHD and treatment satisfaction. Additional research should further consider the extent to which the ADHD subtype impacts the perception of treatment success.

The Current Study

In the current study, I utilized a cross-sectional anonymous survey of emerging adults, aiming to replicate prior research with children and adolescents showing that resilience can attenuate the relation between ADHD symptoms and lower QoL in individuals with ADHD, with the goal of demonstrating that these associations are robust across developmental stages. I also addressed several novel questions that have not been considered in the literature: namely, associations between subtype symptom severity and QoL, the subtype of resilience, and the extent to which the association between ADHD and QoL is moderated by subtype of resilience, and finally, if higher resilience is associated with greater treatment satisfaction among individuals with more ADHD symptomatology.

Hypotheses

Hypothesis 1: ADHD Severity and Quality of Life

I hypothesized that a higher severity of ADHD symptoms would be associated with lower QoL. Providing support for this hypothesis are studies conducted by Gjervan et al. (2014), Hakkaart-van Roijen et al. (2007), Hamilton et al. (2021), Kandemir et al. (2014), Lee et al. (2016), Quintero et al. (2019), and Wanni Arachchige Dona et al. (2023).

Hypothesis 2: ADHD Subtype and Quality of Life

When considering the association between the ADHD subtype (inattentive versus hyperactive) and QoL, I hypothesized that the inverse correlation between the hyperactive ADHD subtype and QoL would be larger than the inverse correlation between the inattentive ADHD subscale score and QoL. Studies conducted by Canu and Carlson (2003), Millstein et al. (1997), and Salvi et al. (2019) support this hypothesis.

Hypothesis 3: ADHD and Quality of Life Moderated by Resilience

I hypothesized that resilience would moderate the association between ADHD and QoL in adults. More specifically, compared to the other resilience subscales, personal competence (PC) would be most likely to have a moderating effect on ADHD and QoL, followed by personal structure (PS), social competence (SC), social support (SS), and familial cohesion (FC). This hypothesis is supported by studies conducted by Dvorsky and Langberg (2016), Lawford and Eiser (2001), Schei et al. (2018), Yıldırım and Tanrıverdi (2021), and Wilmshurst et al. (2011).

Research Question 1:ADHD and Treatment Satisfaction Moderated by Resilience

Additionally, I examined the extent to which resilience moderates treatment satisfaction ratings in individuals with ADHD, exploring whether specific types of resilience moderated the association to a greater or lesser degree.

Research Question 2: ADHD Subtypes and Treatment Satisfaction

Finally, I examined the extent to which ADHD subtypes were correlated with treatment satisfaction.

Method

Participants

A total of 4396 students from six universities in the United States participated in an online survey: 531 (12.1%) from Wyoming (WY), 1455 (33.1%) from the District of Columbia (DC),

645 (14.7) from Texas (TX), 1207 (27.4%) from Colorado (CO), 454 (10.3%) from Virginia (VA) and 104 (2.4%) from Connecticut (CT). 3192 (72.6%) identified as female, 1062 (24.1%) identified as male, and 140 (3.2%) identified as transgender, gender non-binary, exploring, did not identify with the above options, or preferred not to answer. Self-reported race/ethnicity was as follows: 72% White/Non-Hispanic; 5.9% African American/Black; 10.2% Asian/Asian American; 0.6% American Indian/Alaskan Native; 6.4% Mixed Race; and 4.7% Other; additionally, 19.3% of participants reported being of Hispanic, Latino, or Spanish ethnicity (see Table 1). Participants ranged in age between 18 and 52, with a mean age of 19.1 years and a standard deviation of 1.9.

Design and Procedure

The study utilized the College Health and Substance Experiences Survey (CHASE), which was administered through a Qualtrics-based survey platform. Recruitment varied depending on the institution. For WY, DC, TX, CO, and VA, recruitment was conducted via SONA Systems. At CT, participants were recruited via in-class visits, informational flyers, and outreach emails. Informed consent was obtained at the outset of the survey. Nearly all recruitment took place in Psychology 101 courses. All participants had the option to receive course research credit. Participants at CT also had the option to receive extra credit or to be entered into a drawing for a $25 Amazon gift card (if they were not eligible for credit). To claim this incentive, CT participants were directed to a secondary survey that was not linked to their initial responses, safeguarding anonymity. All identifying data linked to this secondary drawing was deleted biannually. Four attentional checks were implemented throughout the survey to ensure participant engagement and data quality. Participant data was excluded if they failed to accurately respond to two or more attentional checks.

Measures

Demographics

Demographic items on the survey included sex assigned at birth, gender identity, age and grade information, race and ethnicity, socioeconomic status, sexual orientation, and political identity.

DSM-5 ADHD Symptom Checklist

The DSM-5 ADHD Symptom Checklist was employed to evaluate inattentive, and hyperactive/impulsive symptoms related to ADHD experienced in the past six months. Participants provided ratings on the frequency of ADHD symptoms using a scale ranging from 0 = *never or rarely* to 3 = *very often* (APA, 2017). Of 18 items, 9 were employed to assess symptoms of inattention [e.g., “Have difficulty sustaining attention in tasks or play activities” (APA, 2017)] and 9 were employed to assess symptoms of impulsivity/hyperactivity (e.g., “Am often "on the go," acting as if "driven by a motor" (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with)” (APA, 2017)). We calculated a mean for symptom severity for each subtype. The reliabilities were excellent for the inattentive (α= .93) and overall scale (α= .94) and good for the hyperactive/impulsive subscale (α= .89).

World Health Organization Quality of Life Scale

Utilizing the World Health Organization Quality of Life Scale (WHOQOL), we assessed participants' quality of life across diverse domains with 26 items. Participants were asked to consider their experiences over the previous two weeks in their responses. Response options were structured on a 5-point scale, ranging from 1 = *very poor* to 5 = *very good* (e.g., “How would you rate your quality of life?”), 1 = *not at all* to 5 = *completely* (e.g., “To what extent do

you feel your life is meaningful?" and "Do you have enough energy for everyday life?"), 1 = *very dissatisfied* to 5 = *very satisfied* (e.g., "How satisfied are you with yourself?"), and 1 = *never* to 5 = *always* (e.g., "How often do you have negative feelings such as blue mood, despair, anxiety, depression?"). Questions targeted different domains of QoL, including physical QoL, psychological QoL, social QoL, environmental QoL, and overall QoL (WHOQOL Group, 1998). The two items that comprised the overall QoL score were highly correlated ($r = .52$, $p < .001$). The reliabilities were good for the physical (α= .84) and environmental subscales (α= .85), and acceptable for the psychological (α= .76) and social subscales (α= .71).

Adult Resilience Scale

We used 20 items from the Adult Resilience Scale (ARS) developed by Friborg et al. (2003) to measure participants' resilience. This briefer scale was developed following factor analyses of the original 31-item scale (see Kim & Cronley, 2020, for a review), which isolated 20 items as having the highest loadings for the subscales described below. The ARS explores beliefs in personal abilities and the role of self-belief in overcoming challenging situations. Response options were on a 5-point scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree*, with questions targeting different domains of resilience such as personal structure (eg., "Rules and regular routines make my daily life easier") and social competence (e.g., "It is easy for me to think of good conversational topics") (Friborg et al., 2003). Reliability of the overall scale was excellent (α=.92). Reliabilities of the social support subscale (α=.95), the familial cohesion subscale (α=.93), and the personal competence subscale (α=.90) were excellent. Reliabilities of the personal structure (α= .83) and social competence subscales (α= .89) was good.

Treatment Satisfaction Scale

Participants' satisfaction with specific ADHD treatments and interventions was assessed using the Treatment Satisfaction Scale developed by Görtz-Dorten et al. (2011). This scale aimed to capture participants' perspectives on various aspects of ADHD treatment. Participants were asked if they had been given a formal diagnosis, including the age at which the diagnosis occurred, and whether they were currently taking or had previously taken medication for ADHD. Additionally, participants were asked if they were presently engaged or had been in the past with a counselor or mental health professional regarding ADHD-related issues. Answer options included: *Yes/No/Not now, but I did in the past*.

Participants who answered yes to the previous questions were then prompted to identify their level of satisfaction with experienced treatment modalities (e.g., “If yes to the medication question: Overall, how satisfied are you with your experiences taking medication for ADHD?” and “If yes to the therapist question: Overall, how satisfied are you with your experiences working with a counselor/therapist?”) (Görtz-Dorten et al., 2011). Participants responded on a 6-point, ranging from 1 = *strongly disagree* to 5 = *strongly agree* (Görtz-Dorten et al., 2011). Reliability of the treatment satisfaction scale was excellent (α=.95).

Data Analysis

Hypothesis 1: ADHD Severity and Quality of Life

A correlational analysis using SPSS was conducted to examine the relation between ADHD symptom severity and QoL (IBM SPSS, 2021). Specifically, Pearson correlation coefficients were calculated to determine the strength and direction of the associations between these variables.

Hypothesis 2: ADHD Subtype and Quality of Life

I explored the association between ADHD subtype (inattentive vs. hyperactive) and QoL through additional correlational analyses. Pearson correlation coefficients were calculated to assess the strength and direction of the relationship between ADHD subtype scores and QoL (IBM SPSS, 2021).

Hypothesis 3: ADHD and Quality of Life Moderated by Resilience

To investigate a possible moderation effect of resilience on the relation between ADHD and quality of life, I used Model 1 in the PROCESS macro for SPSS (IBM SPSS, 2021; Hayes, 2017). ADHD symptom severity was the independent variable, quality of life the dependent variable, and resilience subscales (overall resilience, personal competence, personal structure, social competence, social support, and familial cohesion) were tested as potential moderators.

Research Question 1: ADHD and Treatment Satisfaction Moderated by Resilience

I conducted a moderation analysis with the PROCESS macro in SPSS (IBM SPSS, 2021; Hayes, 2017) to examine the moderating effect of resilience on the relations between ADHD and treatment satisfaction. ADHD symptom severity was the independent variable, treatment satisfaction the dependent variable, and resilience subscales the moderators.

Research Question 2: ADHD Subtypes and Treatment Satisfaction

I performed a correlation analysis to investigate the relation between ADHD subtypes and treatment satisfaction (IBM SPSS, 2021). Pearson correlation coefficients were calculated to assess the strength and direction of the association between ADHD subtype scores and treatment satisfaction.

Results

Demographics

In describing their sex assigned at birth, participants reported the following frequencies: 1091 (24.9%) reported being assigned male at birth, and 3299 (75.1%) reported being assigned female at birth. Regarding gender identity, 1060 (24.1%) reported identifying as male, 3192 (72.6%) identifying as female, 93 (2.1%) reported identifying as nonbinary, gender fluid, or genderqueer, 18 (0.4%) reported identifying as a transgender male, 4 (0.1%) reported identifying as a transgender female, and 25 (0.6%) reported being unsure. Nearly half (50.6%) of participants reported being first-year students, 28.5% reported being second-year students, 13.3% reported being third-year students, and 7.5% reported being fourth-year students (see Table 1). Most (n=3720; 84.7%) reported no Greek-life participation.

Participants described their socioeconomic status (SES) as: 132 (3.0%) poor or just barely making it, 699 (15.9%) working or labor class, 1712 (39.0%) middle class, 1575 (35.9%) upper middle class, and 274 (6.2%) wealthy (see Table 1).

ADHD Severity and Quality of Life

I investigated the relation between the severity of ADHD symptoms and overall QoL. The Pearson correlation coefficient revealed a significant negative correlation between ADHD symptom severity and QoL (r = -0.293, p < .001, N = 4351). This indicates that as the severity of ADHD symptoms increased, overall QoL tended to decrease. These results supported hypothesis one, namely that individuals with more severe ADHD symptoms reported lower levels of overall quality of life (see Table 2).

ADHD Subtype and Quality of Life

I further investigated the relation between ADHD subtypes (inattentive and hyperactive) and overall QoL. I hypothesized that the inverse correlation between the hyperactive ADHD subtype and QoL would be larger than the inverse correlation between the inattentive ADHD subtype and QoL. The Pearson correlation coefficients revealed significant negative correlations between QoL and both the inattentive (r = -0.327, $p < .001$, N = 4349) and hyperactive (r = -0.200, $p < .001$, N = 4342) ADHD subtypes. Contrary to the hypothesis, though, the correlation between the hyperactive ADHD subtype and QoL was smaller in magnitude compared to the correlation between the inattentive ADHD subtype and QoL (see Table 3).

ADHD and Quality of Life Moderated by Resilience

I examined whether resilience moderated the association between ADHD and QoL. My hypothesis was that resilience would affect the strength of this association; specifically, that the association between ADHD severity and QoL would be weaker among participants reporting higher resilience. The regression analysis revealed a significant overall model [$F(3, 4345)$ = 471.742, $p < .001$], explaining approximately 24.57% of the variance in QoL (R^2 = .2457). Both ADHD severity (B = -.8749, SE = .0611, $p < .001$) and resilience (B = 1.6690, SE = .0554, $p <$ .001) were significant predictors of QoL. Specifically, higher ADHD severity was associated with lower QoL, and greater resilience was linked to higher QoL.

Further, there was a significant interaction between ADHD severity and resilience on QoL [$F(1, 4345)$ = 22.7406, $p < .001$]. Conditional effects analysis indicated that the interaction was significant at lower levels of resilience *(-1 standard deviation)* (overall resilience = -0.6706), (B = -1.1352, SE = .0810, $p < .001$); at the mean level of resilience (B = -.8749, SE = .0611, $p <$ .001); and at higher levels of resilience *(+1 standard deviation)* (B = -.6145, SE = .0829, $p <$

.001). These findings supported my hypothesis that resilience moderated the relation between ADHD severity and QoL (see Figure 2).

Both the inattentive and hyperactive subscales of ADHD were examined in relation to the dependent variable. Multiple regression analysis of the inattentive subscale revealed a significant overall model, [$F(3, 4343) = 485.6126$, $p < .0001$], explaining 25.12% of the variance in overall QoL variable ($R^2 = .2512$). Both inattentive ADHD severity ($B = -.7861$, $SE = .0526$, $p < .0001$) and resilience ($B = 1.6160$, $SE = .0561$, $p < .0001$) were significant predictors. Specifically, higher inattentive ADHD severity was associated with lower overall QoL; higher resilience was associated with higher QoL.

A significant interaction between inattentive ADHD severity and mean resilience on overall QoL was observed, [$F(1, 4343) = 24.3606$, $p < .0001$]. Conditional effects analysis indicated that the interaction was significant at various levels of resilience. At low levels of resilience, the effect of inattentive ADHD symptoms on overall QoL was strongest ($B = -1.0112$, $SE = .0662$, $p < .0001$), decreasing in magnitude as resilience increased ($B = -.7684$, SE = .0530, $p < .0001$ at mean level; $B = -.5639$, $SE = .0724$, $p < .0001$ at high level). These findings support the hypothesis that resilience moderates the relation between inattentive ADHD severity and overall QoL.

In the investigation of the association between hyperactive ADHD symptoms, overall QoL, and mean resilience, the model was significant, [$F(3, 4337) = 424.4250$, $p < .0001$], explaining 22.70% of the variance in overall QoL ($R^2 = .2270$). Both hyperactive ADHD severity (B = -.6445, SE = .0607, p < .0001) and resilience (B = 1.7745, SE = .0549, p < .0001) emerged as significant predictors. Higher hyperactive ADHD severity was associated with lower overall QoL scores, while higher levels of resilience were linked to higher overall QoL scores.

Further analysis unveiled a significant interaction between hyperactive ADHD severity and mean resilience on overall QoL, [$F(1, 4337) = 9.0118$, $p = .0027$]. Conditional effects analysis indicated that the interaction was significant at various levels of resilience. At low levels of resilience, the effect of hyperactive ADHD on overall QoL was strongest ($B = -0.8108$, $SE = .0831$, $p < .0001$), diminishing in magnitude as resilience increased ($B = -0.6312$, $SE = .0608$, $p < .0001$ at mean level; $B = -0.4800$, $SE = .0809$, $p < .0001$ at high level). As such, resilience is shown to moderate the association of hyperactive ADHD symptoms on overall QoL.

To investigate whether the resilience subscales moderated the association between ADHD severity and quality of life (QoL) in adults, I conducted separate moderation analyses using each resilience subscale. Specifically, I aimed to determine whether certain facets of resilience, such as personal competence (PC), personal structure (PS), social competence (SC), social support (SS), and familial cohesion (FC), and their interactions with ADHD symptom severity would evidence different associations with QoL.

Personal Competence

The regression model was significant [$F(3, 4345) = 347.487$, $p < .001$], explaining approximately 19.35% of the variance in QoL ($R^2 = .1935$). Both ADHD severity ($B = -.9591$, $SE = .0632$, $p < .001$) and personal competence ($B = 1.1546$, $SE = .0484$, $p < .001$) significantly predicted QoL. However, the interaction term between ADHD severity and personal competence was not significant ($p = .0958$) (see Figure 3).

Personal Structure

The regression analysis for personal structure was significant [$F(3, 4345) = 251.981$, $p < .001$], explaining approximately 14.82% of the variance in QoL ($R^2 = .1482$). Both ADHD severity ($B = -1.0738$, $SE = .0646$, $p < .001$) and personal structure ($B = .9121$, $SE = .0513$, $p <$

.001) significantly predicted QoL. However, the interaction term between ADHD severity and personal structure was not significant ($p = .3474$), indicating that personal structure did not moderate the association between ADHD severity and QoL (see Figure 4).

Social Competence

Similarly, the regression for social competence was significant ($F(3, 4345) = 327.762$, $p < .001$), explaining approximately 18.45% of the variance in QoL ($R^2 = .1845$). ADHD severity ($B = -1.1417$, $SE = .0625$, $p < .001$) and social competence ($B = .9182$, $SE = .0401$, $p < .001$) were significant predictors of QoL. However, the interaction term between ADHD severity and social competence was not significant ($p = .4104$), suggesting that social competence did not moderate the association between ADHD severity and QoL (see Figure 5).

Familial Cohesion

For familial cohesion, the regression analysis was significant ($F(3, 4345) = 365.323$, $p < .001$), explaining approximately 20.14% of the variance in QoL ($R^2 = .2014$). Both ADHD severity ($B = -1.0208$, $SE = .0622$, $p < .001$) and familial cohesion ($B = 1.0212$, $SE = .0414$, $p < .001$) significantly predicted QoL. In addition, the interaction term between ADHD severity and familial cohesion was significant ($p = .0059$).

Conditional effects analysis revealed that the effect of ADHD severity on QoL was attenuated at differing levels of familial cohesion. At lower levels of familial cohesion (familial cohesion = -0.9139), the effect of ADHD severity on QoL was notably attenuated ($B = -1.1779$, $SE = .0823$, $t = -14.3173$, $p < .0001$). At moderate levels of familial cohesion, the effect of ADHD severity on QoL remained significant ($B = -1.0208$, $SE = .0622$, $t = -16.4032$, $p < .0001$); the same was true for higher levels of familial cohesion ($B = -0.8638$, $SE = .0865$, $t = -9.9874$, $p < .0001$) (see Figure 6).

Social Support

The regression analysis for social support was significant ($F(3, 1001) = 60.7126$, $p < .001$), explaining approximately 15.39% of the variance in QoL ($R^2 = .1539$). Both ADHD severity ($B = -1.0965$, $SE = .1406$, $p < .001$) and social support ($B = .9901$, $SE = .1037$, $p < .001$) were significant predictors of QoL. However, the interaction term between ADHD severity and social support was not significant ($p = .3893$), indicating that social support did not moderate the association between ADHD severity and QoL. Overall, only one resilience subscale (familial cohesion) moderated the association between ADHD severity and QoL (see Figure 7).

ADHD and Treatment Satisfaction Moderated by Resilience

We examined the association between resilience and treatment satisfaction ratings among individuals with ADHD, specifically exploring whether different facets of resilience moderated this association. The analysis considered five facets of resilience: personal competence, personal structure, social competence, social support, and familial cohesion. The interaction between overall ADHD score and overall resilience was not significant ($p = 0.7215$), but resilience did predict treatment satisfaction directly ($B = 0.2578$, $SE = 0.0722$, $t = 3.5726$, $p < .001$) (see Figure 8).

Personal Competence

The regression analysis revealed a significant main effect of ADHD severity on treatment satisfaction ratings ($B = -0.0246$, $SE = .0689$, $p = 0.7246$). However, the interaction between ADHD severity and personal competence was not significant ($B = -.0537$, $SE = .0747$ $p = 0.4437$), indicating that personal competence did not moderate the relationship between ADHD severity and treatment satisfaction.

Personal Structure

Similarly, there was a significant main effect of ADHD severity on treatment satisfaction (B = -0.0286, SE = .0690, p = 0.6782), but the interaction with personal structure was not significant (B = .0238, SE = .0763, p = 0.7557), signifying that personal structure did not moderate the association between ADHD severity and treatment satisfaction.

Social Competence

For social support, the main effect of ADHD severity on treatment satisfaction was not significant (B = -0.0373, SE = .0710, p = 0.5997). Moreover, the interaction between ADHD severity and social support was not significant (B = .0139, SE = .0677, p = 0.8371), demonstrating that social support did not moderate the relationship between ADHD severity and treatment satisfaction.

Familial Cohesion

The analysis showed a non-significant main effect of ADHD severity on treatment satisfaction (B = -0.0216, SE = .0694, p = 0.7561). Additionally, the interaction between ADHD severity and familial cohesion was not significant (B = -0.0206, SE = .0658, p = 0.7541), such that familial cohesion did not moderate the association between ADHD severity and treatment satisfaction.

Social Support

Lastly, there was no main effect of ADHD severity on treatment satisfaction (B = 0.0610, SE = .1453, p = 0.59976759). Moreover, the interaction between ADHD severity and social support was not significant (B = 0.0094, SE = .2018, p = 0.9629), revealing that social support did not moderate the relationship between ADHD severity and treatment satisfaction.

ADHD Subtypes and Treatment Satisfaction

Finally, I examined the relation between ADHD subtypes (inattentive and hyperactive) and treatment satisfaction. The correlations revealed that neither inattentive symptoms (r = -0.032, p = 0.534), nor hyperactive symptoms (r = 0.001, p = 0.991) were significantly correlated with current treatment satisfaction scores.

Exploratory Analyses

Associations between Demographics and ADHD Diagnostic Status

There were 589 participants (13.4%) who reported having received a formal diagnosis of ADHD or ADD from a healthcare or mental healthcare provider during their lifetime. Results of a Chi-square exploring whether sex assigned at birth was associated with a greater likelihood of an ADHD diagnosis indicated that a similar percentage of males (n=152; 13.9%) and females (n=437; 13.2%) reported a lifetime diagnosis (χ^2=.332, df=1, p=.565) (see Table 1).

I conducted a Chi-square to explore the relation between race/ethnicity and having a lifetime diagnosis of ADHD or ADD by a healthcare provider. Among White participants, 14.9% reported a diagnosis. In contrast, 8.1% of Black or African American participants; 8.7% of Asian or Asian American participants; 3.7% of American Indian or Alaskan Native participants; 12.4% of Mixed race; and 9.1% of other identifying participants reported a diagnosis. The Chi-square test was significant (χ^2=26.83, df=5, p<.001), indicating a significant association between race/ethnicity and an ADHD diagnosis. Adjusted residuals showed that White participants were more likely to report a diagnosis compared to Black or African American and Asian or Asian American participants. For ethnicity, 14.2% of White participants reported a lifetime diagnosis compared to only 10.1% of Hispanic, Latino, or Spanish participants (χ^2=9.72, df=1, p=.002)

Regarding SES, some economic groups showed a greater/lesser likelihood of diagnosis than what would be expected by chance (χ^2=54.20, *df*=4, *p*<.001). Specifically, adjusted standardized residuals showed that participants who categorized themselves as middle class reported a lower diagnosis rate (10.9%) than would be expected by chance. Alternatively, 16.4% of the upper middle class and 23% of participants identifying as wealthy reported lifetime diagnoses.

Associations between Demographics and Meeting the Clinical Cutoff for ADHD

A total of 644 individuals, comprising 14.7% of the overall sample, screened in as meeting the threshold for an ADHD diagnosis with no previous diagnosis of ADHD. Among those screened in with no previous diagnosis, White individuals constituted the largest racial/ethnic group, accounting for 69.3% (*n*=446) of the sample. Black individuals represented 5.74% (*n*=37), Asian individuals accounted for 10.9% (65 individuals), American Indian individuals comprised 1.4% (*n*=9), and individuals identifying as mixed race represented 7.14% (46 individuals) of the screened-in group. Additionally, 6.21% (*n*=40) identified as belonging to other racial/ethnic categories.

Gender distribution revealed 157 males (24.45%) and 485 females (75.55%) screened in without having previously been diagnosed with ADHD. Regarding socioeconomic status, the breakdown was as follows for individuals who screened in with no previous diagnosis: 30 individuals (4.66%) were classified as poor or just barely making it, 130 individuals (20.19%) were categorized as working or labor class, 263 individuals (40.8%) were situated within the middle-income bracket, 178 individuals (27.64%) were identified as upper middle class, and 43 individuals (6.68%) were denoted as wealthy.

Discussion

As ADHD continues to affect approximately 1,019,040 of 15.5 million undergraduate college students in 2021 in the United States (Hanson, 2024), gaining insight into the disorder remains of paramount importance. Understanding the impact of ADHD on the emerging adult demographic is crucial due to the disorder's potential negative impacts on academic performance, mental health, and overall quality of life. Despite the growing recognition of ADHD in college students, there remains a need for further research to elucidate the factors that influence quality of life among students with ADHD.

The current study investigated the potential role of resilience in buffering the impact of ADHD symptoms on QoL. Specifically, I aimed to address the gaps in the literature by considering the moderating impact of resilience, utilizing a population of emerging adults, operationalizing resilience as a collection of skills in various domains (i.e., coping skills, adaptability, optimism, social and familial support, self-efficacy, and a sense of purpose; Friborg et al., 2003), and by assessing the relation between subtypes of ADHD and QoL. By examining the association between resilience and quality of life in college students, this study sought to illuminate mechanisms through which individuals with ADHD may maintain or improve their well-being despite experiencing symptoms of the disorder and to replicate previous child studies of resilience, ADHD, and QoL with an adult population. Ultimately, these findings may help in establishing novel interventions for clinical and non-clinical populations with ADHD symptoms and provide valuable insights to inform programing and outreach in higher education settings.

ADHD and Quality of Life

Substantiating and replicating prior research by Ginapp et al. (2022) and Wilmshurst et al. (2011), the results of this study indicated a significant inverse association between ADHD and

QoL. Individuals with greater ADHD symptom severity displayed significantly lower overall QoL. Further, all domains of QoL, including physical, psychological, social, and environmental QoL, displayed an inverse association with overall ADHD symptom severity, demonstrating the broad impact of ADHD in all areas of functioning and replicating the findings of Wanni Arachchige Dona et al. (2023), Kandemir et al. (2014) and Lee et al. (2016) in an emerging adult population. This finding suggests that research in children examining the relation between ADHD and QoL can be generalized to emerging adults. Additionally, the replication of these findings in an adult population indicates that the challenges associated with ADHD persist into adulthood and are associated with individuals' daily functioning and overall well-being, emphasizing the need for continued intervention and support.

In individuals with ADHD, these findings suggest that lower QoL may be attributed to the interaction of physical, psychological and cognitive, social, and environmental factors associated with the disorder. Executive functioning challenges, such as difficulties with planning, organizing, and prioritizing tasks, may contribute to academic or professional difficulties and may cause feelings of frustration and inadequacy, diminishing social and environmental QoL (Quintero et al., 2019). Impulsive behaviors and overall hyperactivity may disrupt social interactions and relationships, leading to perceived or actual isolation or rejection and impacting social and psychological QoL.

Emotional dysregulation, an element of ADHD characterized by mood swings and difficulty managing emotions, may impair relationships and contribute to lower psychological QoL (Wanni Arachchige Dona et al., 2023). Additionally, impairments in concentration, focus, and sustained attention can impact academic and professional performance, contributing to difficulties of achievement and instability within school or professional settings, impacting one's

environmental, social, and psychological QoL. Health-related issues associated with ADHD, such as sleep disturbances and substance misuse, may further impact physical QoL (Lee et al., 2016; Ginapp et al., 2022). Furthermore, misconceptions and stigma surrounding ADHD can lead to feelings of shame and self-doubt, contributing to lower self-esteem and lower overall QoL (Ginapp et al., 2022; Toner et al., 2006).

Both inattentive and hyperactive subtypes of ADHD were significantly and inversely associated with all types of QoL. Prior literature suggested that the hyperactive/impulsive subtype may be more significantly correlated with lower QoL scores as compared to the inattentive subtype (Millstein et al., 1997; Salvi et al., 2019). However, the hyperactive subtype was not more closely associated with lower QoL as hypothesized. Instead, inattentive ADHD symptoms were correlated more strongly with overall QoL. Notably, this discrepancy between our findings and the literature may be due to more individuals presenting with greater inattentive symptomatology in the current study. Additional research should investigate whether inattentive symptoms might, in fact, be associated with more impairment in emerging adults.

The significant association between ADHD symptom severity and QoL in emerging adults highlights the need for interventions tailored to some of the unique challenges of this life stage. For example, as individuals with ADHD transition into adulthood, they may face additional challenges related to academic or occupational responsibilities, interpersonal relationships, and independent living. Individuals with greater inattentive symptoms might particularly require additional support to ensure they have the greatest opportunity to succeed in academic/professional and personal domains. Such supports might include time management training, testing accommodations, and behavioral interventions to foster organization and social or academic participation.

Although a causal relation between ADHD and QoL cannot be inferred, ADHD symptom reduction may ultimately contribute to a better QoL. Therefore, interventions aimed at improving QoL for individuals with ADHD should consider the unique situational needs and life circumstances of adults with the disorder and should strive for symptom improvement, rather than fixating on complete symptom remission. As such, considering factors such as resilience may be beneficial to reducing the impact of ADHD on QoL.

ADHD and Quality of Life Moderated by Resilience

Consistent with my hypothesis, there was a significant association between overall ADHD severity, overall resilience, and overall QoL. Specifically, in a model including overall ADHD severity, resilience, and their interaction as predictors of overall QoL, greater ADHD severity was associated with lower QoL, while greater resilience was linked to higher QoL. These findings aligned with prior research indicating the detrimental impact of ADHD symptoms on various domains of functioning and highlight the importance of resilience as a protective factor against adverse outcomes (Ginapp et al., 2022; Wilmshurst et al., 2011). Further, overall resilience moderated the impact of both inattentive and hyperactive subtypes of ADHD on overall QoL, indicating that resilience can have a buffering effect regardless of the symptom presentation. Thus, promoting resilience is vital for all individuals with ADHD, regardless of subtype.

While previous literature has asserted that resilience is correlated with a greater reported QoL, research has seldom considered resilience as a moderator of the association between QoL and ADHD. As noted by Song et al. (2021), in analyzing resilience and various disorders such as depression and anxiety, the presence of a disorder (risk factor) does not automatically equate with adverse outcomes: a positive relation was found between resilience and QoL, whereby

resilience moderated the effect of ADHD on QoL. Prior studies of the moderating role of resilience on ADHD and QoL were primarily conducted with child populations, and the results of this study suggest that such findings can be generalized to adult populations.

When I analyzed the subtypes of resilience separately in moderation analyses, familial cohesion was the only subscale found to moderate the association between ADHD severity and QoL. This finding echoes previous child literature showing that familial resilience mitigates cognitive and psychological challenges of ADHD and promotes better outcomes. This may be due to familial cohesion's role in promoting supportive and nonjudgmental environments (thus uplifting social and environmental QoL), instilling structure and routine (improving psychological QoL), building skills of emotional regulation, communication, and problem-solving (psychological and overall QoL) (Dvorsky & Langberg, 2016; Schei et al., 2015; Song et al., 2021).

Other subtypes of resilience, including personal competence, personal structure, social competence, and social support, were not significant moderators of the association between ADHD and QoL. However, higher levels of these types of resilience did predict higher QoL. Previous literature suggested the predictive nature of resilience in QoL, but these elements were not moderating as hypothesized (Lawford & Eiser, 2001; Schei et al., 2018; Wilmshurst et al., 2011). Ultimately, this emphasizes the need for additional research relating to resilience subtypes and underscores the importance of operationalizing resilience as a set of skills and capacities in different domains rather than as a singular construct.

As such, when considering programming and interventions for college students with ADHD, promoting resilience may be particularly beneficial. Promoting overall resilience, such as through interventions and programming focussing on adaptive coping strategies,

problem-solving, communication skills, and emotional regulation abilities, may enable individuals to be better equipped to navigate physical, psychological, social, and environmental challenges associated with ADHD, leading to improved overall QoL.

The significant moderating impact of familial cohesion in emerging adults highlights the importance of considering family-based interventions, even in emerging adult populations. Interventions to strengthen familial cohesion and promote positive family dynamics may improve outcomes for individuals with ADHD by providing a supportive and nurturing environment that fosters resilience, enhances coping mechanisms, and promotes adaptive functioning. By involving families in emerging adults' lives by fostering family communication, engagement, and support, clinicians and educators may boost an individual's resilience, enhancing the QoL of individuals with ADHD and facilitating their overall well-being and success.

ADHD and Treatment Satisfaction Moderated by Resilience

Contrary to my hypothesis, overall resilience did not moderate the association between ADHD severity and treatment satisfaction; however, resilience did have a main effect on treatment satisfaction. Specifically, when controlled for ADHD symptoms severity, individuals with higher levels of resilience evidenced greater satisfaction with their ADHD treatment, suggesting that resilience may play a direct and positive role in shaping individuals' perceptions of the effectiveness and helpfulness of their ADHD treatment interventions. This denotes the importance of considering resilience as a valuable asset in the context of ADHD management and treatment.

Notably, it is unclear whether greater resilience leads to higher treatment satisfaction, or if the effectiveness of treatment itself fosters resilience. One possible explanation for the direct

effect of resilience on treatment satisfaction is that individuals with higher levels of resilience may possess better coping strategies, problem-solving skills, and emotional regulation abilities that enable engagement with and benefit from ADHD treatment interventions. Additionally, resilience may foster a positive mindset and attitude towards treatment, enhancing individuals' motivation, persistence, and commitment to their treatment plans. On the other hand, treatment may foster resilience in individuals with ADHD, improving their overall functioning and disposition. Additionally, as this was a cross-sectional study, it is possible that a third factor might account for the predictive impact of resilience on treatment satisfaction. As such, additional longitudinal research is needed to characterize this relation.

These findings highlight the importance of incorporating resilience-focused interventions into ADHD treatment approaches. Interventions aimed at enhancing resilience, such as cognitive-behavioral therapy, mindfulness training, and social skills programs, may complement traditional ADHD treatments by strengthening individuals' ability to cope with challenges, regulate emotions, and maintain a positive outlook. They offer promising avenues for boosting resilience, as they address various aspects of mental and emotional well-being.

For instance, exposure therapy and cognitive reappraisal help individuals manage negative responses, reducing the impact of stress on their mental and physical health. Similarly, optimism training and social connection-building actively promote resilience by creating supportive networks and cultivating a mindset that can buffer against adversity. Additionally, mindfulness practices and engagement in spiritual activities encourage individuals to transcend self-limiting thoughts and foster a deeper sense of connection, further enhancing resilience. Implementing integrated approaches, such as social support interventions and substance abuse prevention, can significantly bolster resilience by addressing multiple facets of an individual's

life and providing comprehensive support (Tabibnia, 2020). Ultimately, by boosting resilience, the overall impact of ADHD on QoL should be lessened; however, the applicability of the stated interventions requires testing in populations with ADHD to determine efficacy.

By considering these implications, practitioners can tailor interventions to better meet the diverse needs of individuals with ADHD, ultimately promoting their resilience and well-being. Future research is needed to further elucidate the relation between resilience and treatment satisfaction, particularly as it pertains to the treatment of ADHD in adult populations. While these findings present a valuable starting point, they do not adequately enable the investigation into temporal or causal inferences.

Exploratory Analyses

Associations between Demographics and ADHD Diagnostic Status

Regarding demographics, no significant difference in the likelihood of diagnosis was identified based on the participants' sex assigned at birth. Notably, males have a higher national diagnosis rate than females (5.4% to 3.2%); we may not have evidenced this gender discrepancy in the current study because of our significantly higher percentage of female participants (U.S. Department of Health and Human Services., 2022).

When considering race and ethnicity, results indicated significant differences in diagnostic rates. White participants reported significantly higher rates of diagnosis as compared to Black or African American participants and Asian or Asian American Participants. Further, non-Hispanic White participants reported significantly higher rates of diagnosis than Latinx, Hispanic, or Spanish participants. These results are similar to national demographic data and highlight the need for investigation into why diagnostic rates appear to differ by race/ethnicity (U.S. Department of Health and Human Services, 2022).

Various factors likely contribute to disparity in diagnosis among racial and ethnic groups. Cultural norms and beliefs relating to mental health, socioeconomic differences, limited access to healthcare services, and potential cultural biases in diagnostic criteria and assessment tools may influence rates of diagnosis. Additionally, implicit biases and stereotypes among healthcare providers may lead to underdiagnosis or misdiagnosis of ADHD in minoritized individuals (Fadus et al., 2020). Addressing these disparities requires comprehensive strategies aimed at increasing awareness, improving access to culturally competent healthcare, addressing socioeconomic inequalities, and promoting unbiased diagnostic practices.

Analysis of socioeconomic status (SES) revealed significant differences in the rates of ADHD diagnoses across socioeconomic groups. Middle-class participants reported significantly lower rates of diagnosis as compared to participants from upper-class or wealthy backgrounds, indicating that having greater socioeconomic means was associated with a greater likelihood of receiving a lifetime diagnosis. This is likely attributed to factors relating to access, such as access to health care and insurance, access to resources and educational tools, and access to institutes of higher education. Additionally, there may be cultural and racial differences that influence diagnostic rates, such as increased rates of conduct disorder over ADHD diagnoses in non-Hispanic Blacks (Fadus et al., 2020). Promoting universal free access to informational and clinical resources is necessitated to address this disparity.

Meeting the Clinical Threshold for ADHD and Associated Demographics

Findings revealed a striking disparity between self-reported lifetime diagnoses of ADHD and the number of individuals meeting the clinical threshold for ADHD when assessed with the DSM-5 ADHD symptom checklist. While 8.4% of the overall population reported a lifetime diagnosis of ADHD, an additional 14.7% of participants who had not previously received a

diagnosis screened in as meeting the clinical threshold for ADHD. This significant difference highlights the potential underdiagnosis or missed recognition of ADHD among individuals who have not received a formal diagnosis. One plausible explanation for this disparity is that ADHD symptoms often go unrecognized or undiagnosed, particularly among individuals who may not have sought formal evaluation or treatment for their symptoms. Additionally, as the sample population is college-attending adults, it is reasonable to assume that these individuals may have better coping skills and higher degrees of adaptability, perhaps enabling a greater likelihood of being missed within the diagnostic system.

By identifying individuals who met the clinical threshold for ADHD based on their symptomatology, the study captured a significant portion of the population that may have otherwise been overlooked or underestimated in terms of their ADHD status. This underscores the importance of utilizing standardized assessment tools and screening measures to accurately identify individuals with ADHD, even in the absence of a formal diagnosis.

Furthermore, the discrepancy between self-reported diagnoses and symptom-based assessments highlights the need for increased awareness and education about ADHD among the general population, educators, researchers, and healthcare professionals. Improving recognition and understanding of ADHD symptoms can help facilitate early detection, diagnosis, and intervention for individuals who may be experiencing difficulties associated with the disorder.

Demographic analysis revealed that white individuals were overrepresented among individuals who screened in with no previous diagnosis of ADHD. This is likely due to the majority of the sampled population identifying as white. However, all sampled racial and ethnic groups had individuals ‘screen in’, indicating a universal need for better assessment of ADHD. The gender distribution among individuals screened in without a previous ADHD diagnosis also

merits attention, with a notably higher proportion of females compared to males. This finding challenges traditional stereotypes of ADHD as predominantly affecting males and highlights the importance of recognizing and assessing ADHD symptoms in females, who may present differently or be underdiagnosed due to gender biases in diagnostic practice. However, this distribution may have also been caused by an overrepresentation of females in the sample population, which merits additional investigation.

When considering the SES of individuals who screened in without a prior ADHD diagnosis, middle-class individuals represented 41% of the individuals who met the diagnostic criteria for an ADHD diagnosis. This is particularly striking when compared to the aforementioned rates of diagnosis, wherein middle-class participants were significantly less likely to report a diagnosis of ADHD. As such, this suggests that socioeconomic factors may play a complex role in the recognition and diagnosis of ADHD. The high representation of middle-class individuals among those who met the diagnostic criteria underscores the importance of considering SES in understanding ADHD prevalence and diagnosis, as this indicates that middle-class individuals are underdiagnosed. Ultimately, the potential impact of socioeconomic status on access to diagnosis and treatment services must be examined, and additional resources should be allocated to lower socioeconomic groups so as to ensure that individuals with ADHD, regardless of SES, have adequate access to resources and support.

Limitations

Although ADHD affects both males and females, the experiences and characteristics of males with ADHD may differ from those of females. Due to the smaller proportion of males in the sample, the applicability of the findings to the broader population, especially concerning gender-specific aspects of ADHD presentation and diagnosis, may be constrained. Further, the

overrepresentation of White and US-residing participants may additionally impact generalizability to different racial, cultural, and global populations. Notably, the mean age of participants was 19.1; thus, it is unknown if the results of this study can be generalized to older adults.

Additionally, this sample may only adequately represent college-attending individuals. College attendees may possess unique characteristics, resources, and access to healthcare services that differ from the general population. As such, the prevalence and recognition of ADHD symptoms among college students may not reflect those of individuals outside of this demographic, limiting the broader applicability of the study findings. This is particularly notable when examining resilience, as this population of individuals with ADHD may be innately more resilient than non-college-attending adults with ADHD (Wilmshurst et al., 2011). Ultimately, additional examination is needed to examine the extent to which this research captures the experiences of non-college-attending adults with ADHD.

Finally, there were several limitations in our assessment of treatment satisfaction. Adherence and efficacy of treatment were not examined. The duration of treatment was also not investigated, and, as ADHD is a chronic condition that often requires long-term management, the duration of treatment can significantly influence treatment outcomes, including elements of resilience and overall satisfaction with treatment.

Future Directions

Future research should explore the extent to which specific interventions and programs can promote resilience among individuals with clinical and subclinical ADHD. Resilience plays a crucial role in helping individuals cope with the challenges of ADHD and navigate daily life effectively. Understanding how various therapeutic approaches contribute to resilience-building

processes could provide valuable insights into optimizing treatment strategies and enhancing long-term outcomes, ultimately improving the overall well-being and functioning of individuals with ADHD.

Future research also should continue to examine relations among ADHD, resilience, and QoL. Subtypes of ADHD should be reexamined as correlates of QoL in populations that are not predominantly female. Further research should also explore the generalizability of the findings across college and non-college-attending populations. Comparing treatment utilization and satisfaction and resilience profiles between these groups can help identify unique challenges and support needs among individuals with ADHD in different life stages and contexts, ultimately informing more targeted interventions and support services to optimize outcomes for diverse populations of individuals with ADHD. Older adults also should be sampled to establish the generalizability of emerging adult research in later stages of life.

Longitudinal research is needed to understand the intricacies of resilience in influencing QoL over longer periods of time and to explore potential causal influences between resilience and treatment satisfaction among individuals with ADHD. Treatment satisfaction is a critical aspect of treatment success, and understanding how it evolves over time can provide valuable insights into factors that contribute to sustained treatment engagement, adherence, and positive outcomes in individuals with ADHD. Finally, tracking changes in resilience levels and QoL longitudinally can help identify patterns of resilience associated with specific outcomes, thus informing interventions to enhance the overall well-being and QoL of individuals with ADHD.

Conclusion

This study replicated findings relating to ADHD severity and diminished QoL in adult populations. The significant inverse association of ADHD and QoL underscores the enduring

impact of ADHD on various domains, including psychological, physical, social, and environmental elements. Furthermore, the study highlights the necessity for tailored support systems, particularly for emerging adults with ADHD, especially those exhibiting inattentive symptoms.

Additionally, it is imperative to recognize and support individuals who may exhibit ADHD symptoms but have not received a formal diagnosis. A considerable percentage of individuals may screen positive for ADHD symptoms without a clinical diagnosis, illuminating the importance of inclusive approaches that consider the spectrum of ADHD experiences. Notably, resilience was found to be a buffering mechanism against the negative effects of ADHD symptoms on QoL, irrespective of clinical status. These findings emphasize the critical importance of implementing resilience-building programs and resources tailored specifically to college students. By providing such resources, colleges can empower students to bolster their resilience and effectively navigate the challenges associated with ADHD, ultimately enhancing their overall well-being and academic success.

Familial cohesion was found to be a particularly effective buffer against the impact of ADHD symptoms, highlighting the need to prioritize initiatives aimed at fostering family communication, promoting engagement, and providing support. Strengthening family cohesion emerges as a vital strategy for boosting resilience among college students with ADHD symptoms, as envisioned in the thesis objectives, thereby further enhancing their overall well-being and academic outcomes.

Ultimately, additional research is needed to better understand ADHD, resilience, and QoL, but this study's findings provide substantial novel evidence in support of recognizing the moderating power of resilience and rejecting a deficit model of ADHD. Future research should

seek to examine promoting resilience via specific interventions and programming to improve the overall QoL of adults with ADHD.

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Tables and Figures

Table 1

Descriptive Statistics for Overall Sample and Participants with ADHD Diagnosis

Characteristic	Total sample ($N = 4396$)	Lifetime ADHD diagnosis ($n = 589$)
Age (*M, SD*)	19.1 (*SD* 1.9)	19.4 (*SD* 1.9)
Sex assigned at birth		
Female	3299 (75.1%)	437 (74.2%)
Male	1091 (24.9%)	152 (25.8%)
Gender identity[a]		
Female	3192 (72.6%)	402 (68.25%)
Male	1060 (24.1%)	145 (24.6%)
Transgender, Non-Binary, Other	93 (2.1%)	41 (6.96%)
Race/ethnicity		
White/non-Hispanic	3166 (72%)	472 (80%)
African American/Black	260 (5.9%)	21 (3.57%)
American Indian/Alaskan Native	27 (0.6%)	1 (0.17%)
Asian/Pacific Islander	448 (10.2%)	39 (6.62%)
Hispanic/Latino/Spanish	836 (19%)	86 (14.6%)
Bi/Multiracial or Other	491 (11.1%)	54 (9.17%)
Class year[a]		
Freshman	2226 (50.6%)	248 (42%)
Sophomore	1253 (28.5%)	191 (32.4%)
Junior	586 (13.3%)	100 (16.98%)
Senior	328 (7.5%)	50 (8.49%)
Socioeconomic status (*M, SD*)	3.26 (*SD* .90)	3.50 (*SD* .89)
ADHD Overall Symptom Score (*M, SD*)	0.776 (*SD* .61)	1.309 (*SD* .69)
Inattentive subscale	0.857 (*SD* .72)	1.476 (*SD* .81)
Hyperactive subscale	0.696 (*SD* .61)	1.142 (*SD* .73)
Resilience Overall Score (*M, SD*)	3.85 (*SD* .67)	3.72 (*SD* .67)
Personal competence	3.92 (*SD* .79)	3.76 (*SD* .83)
Personal structure	3.86 (*SD* .76)	3.67 (*SD* .78)
Social competence	3.51 (*SD* .94)	3.45 (*SD* .95)
Social support	4.37 (*SD* .79)	4.38 (*SD* .78)
Familial cohesion	3.99 (*SD* .91)	3.88 (*SD* .92)
Quality of Life Overall Score (*M, SD*)	16.19 (*SD* 2.73)	15.74 (*SD* 2.77)
Physical QoL	15.53 (*SD* 2.43)	12.17 (*SD* 2.10)
Psychological QoL	13.85 (*SD* 3.06)	12.59 (*SD* 2.36)
Environmental QoL	15.38 (*SD* 2.66)	15.45 (*SD* 2.53)
Social QoL	14.39 (*SD* 3.31)	14.13 (*SD* 3.42)
Treatment Satisfaction (*M, SD*)		2.79 (*SD* 0.91)

Table 2

Correlations of ADHD Overall and Quality of Life

Variable	QoL Overall	QoL Psychological	QoL Physical	QoL Environmental	QoL Social
ADHD Overall	-.293**	-.297**	-.211**	-.206**	-.176**

**p<.01

Table 3

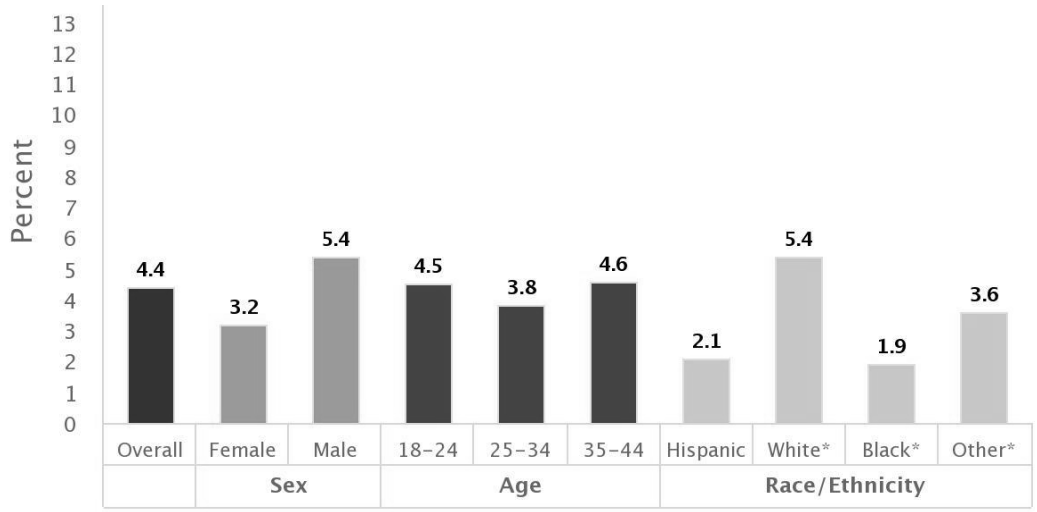
Correlations of ADHD Subtypes and Quality of Life

Variable	QoL Overall	QoL Psychological	QoL Physical	QoL Environmental	QoL Social
ADHD Inattentive	-.327**	-.343**	-.279**	-.207**	-.209**
ADHD Hyperactive	-.200**	-.188**	-.092**	-.168**	-.106**

**p<.01

Figure 1

Prevalence of Current ADHD Among U.S. Adults (2001-2003)



(National Institute of Mental Health, 2022)

Figure 2

Mean Resilience as a Moderator of QoL and ADHD

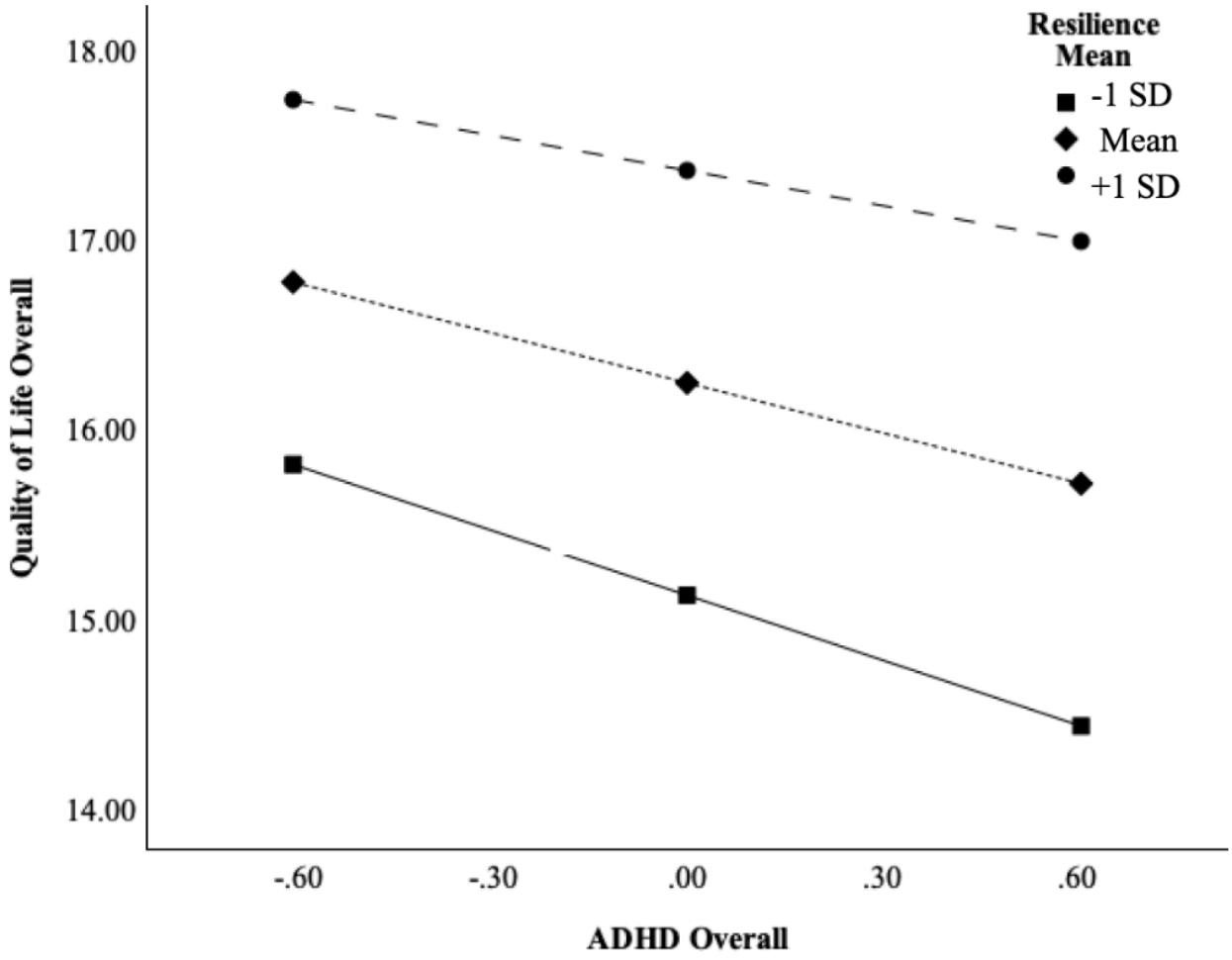


Figure 3

Personal Competence as a Moderator of Treatment Satisfaction and ADHD

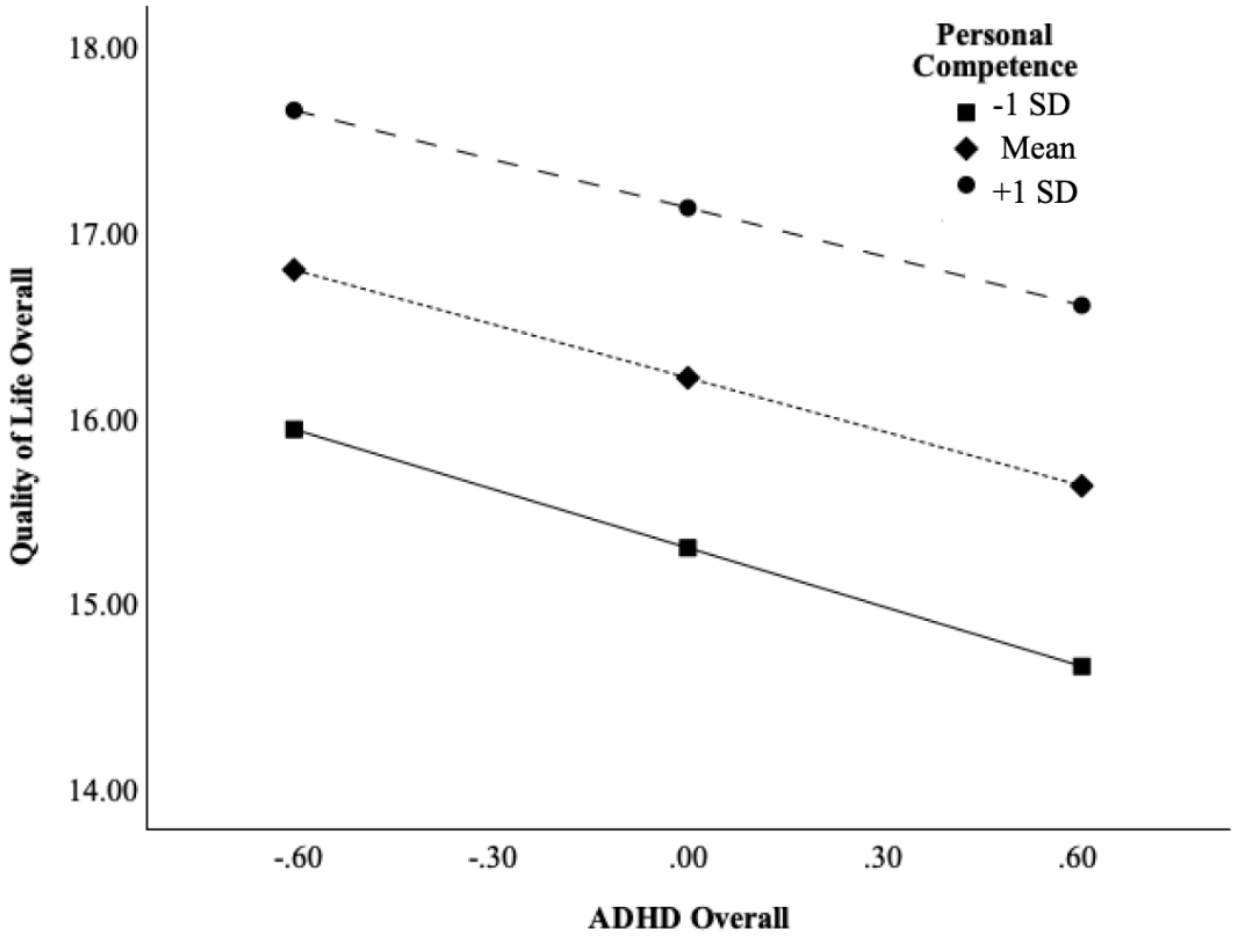


Figure 4

Personal Structure as a Moderator of Treatment Satisfaction and ADHD

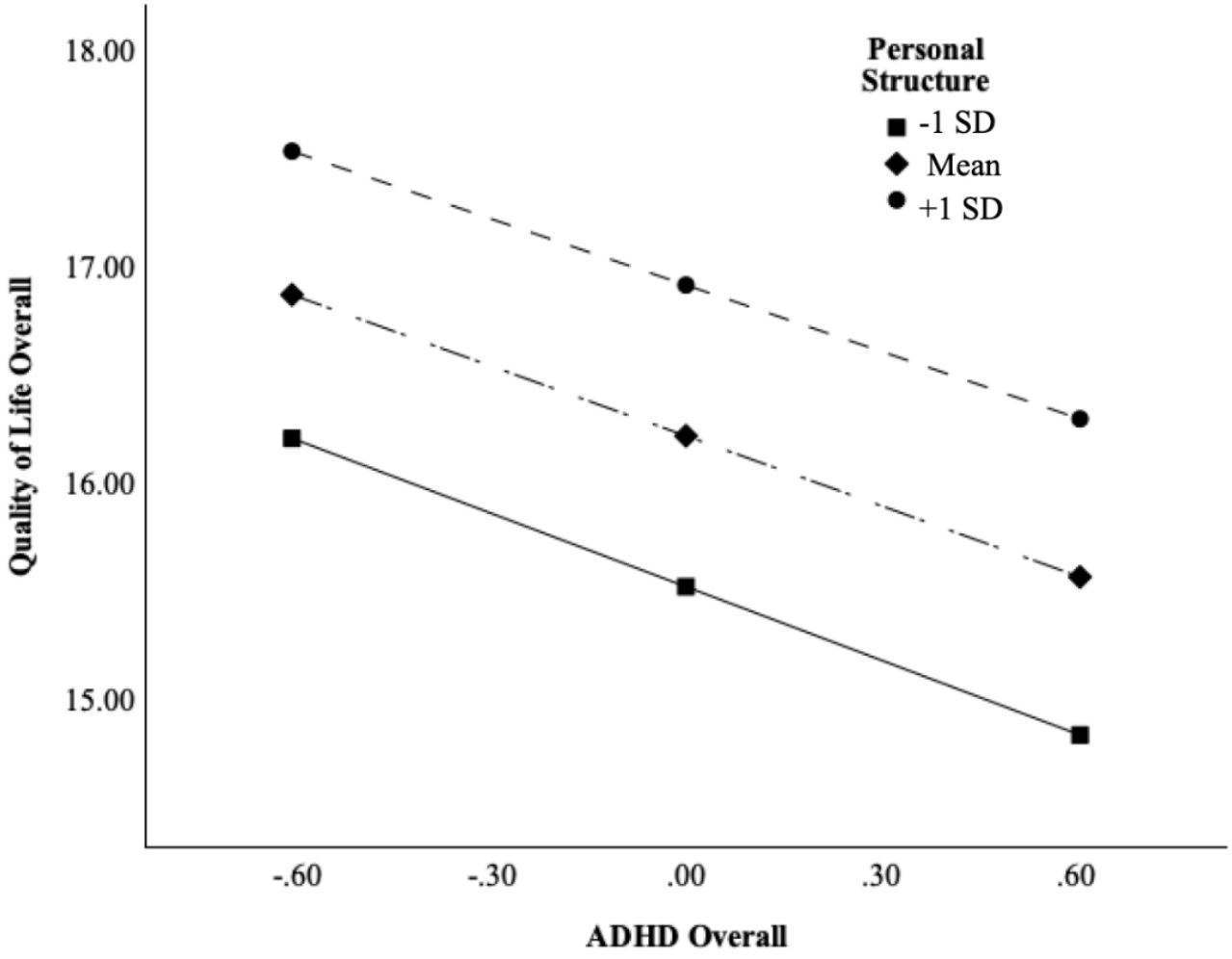


Figure 5

Social Competence as a Moderator of Treatment Satisfaction and ADHD

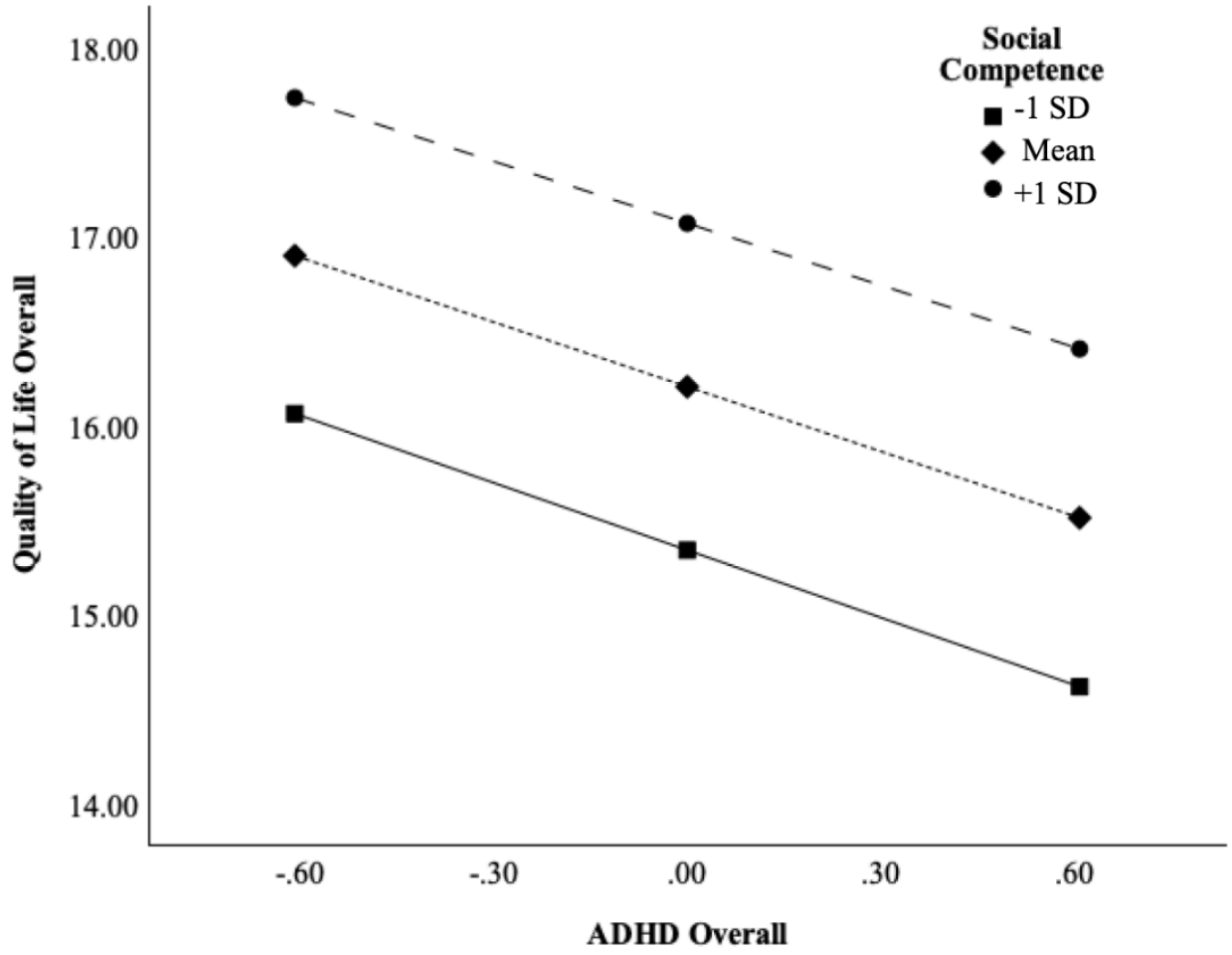


Figure 6

Familial Coherence as a Moderator of QoL and ADHD

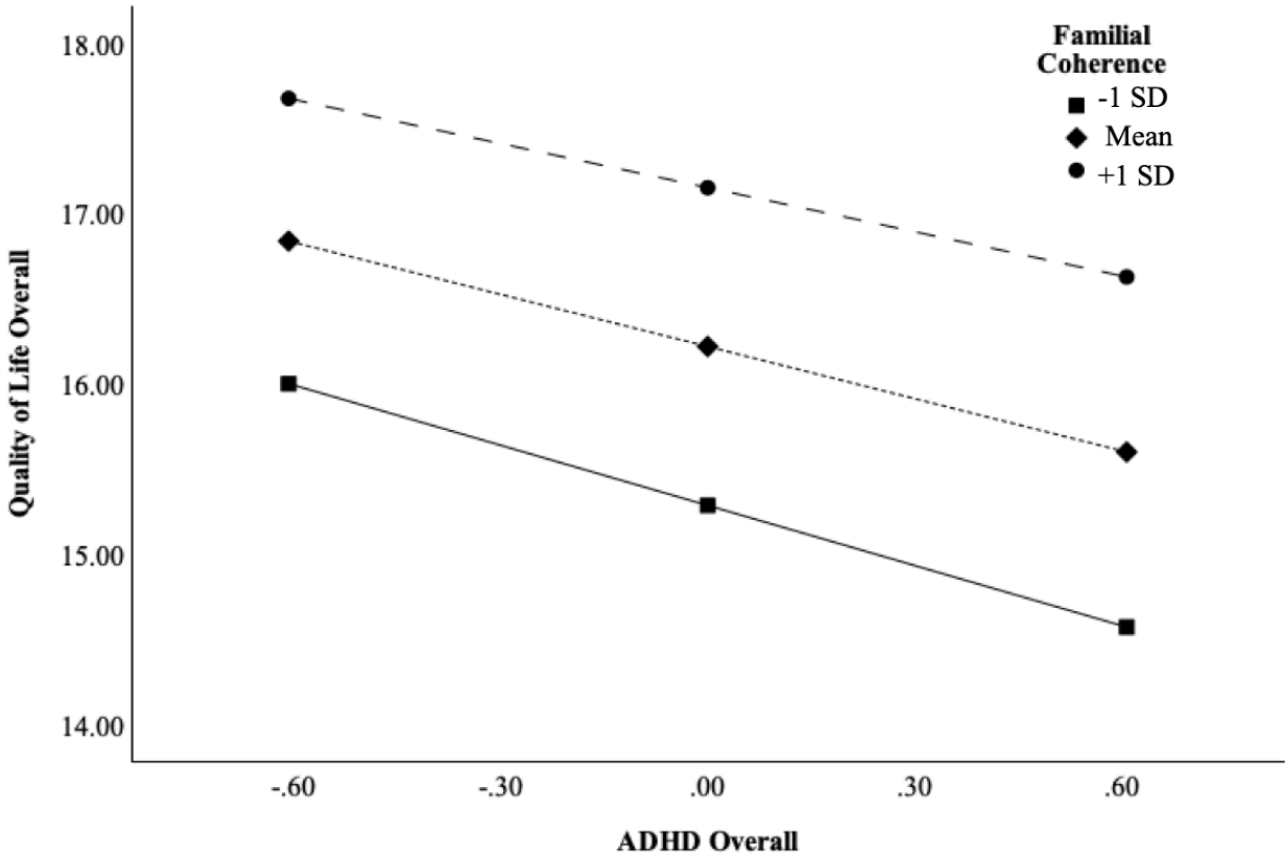


Figure 7

Social Support as a Moderator of Treatment Satisfaction and ADHD

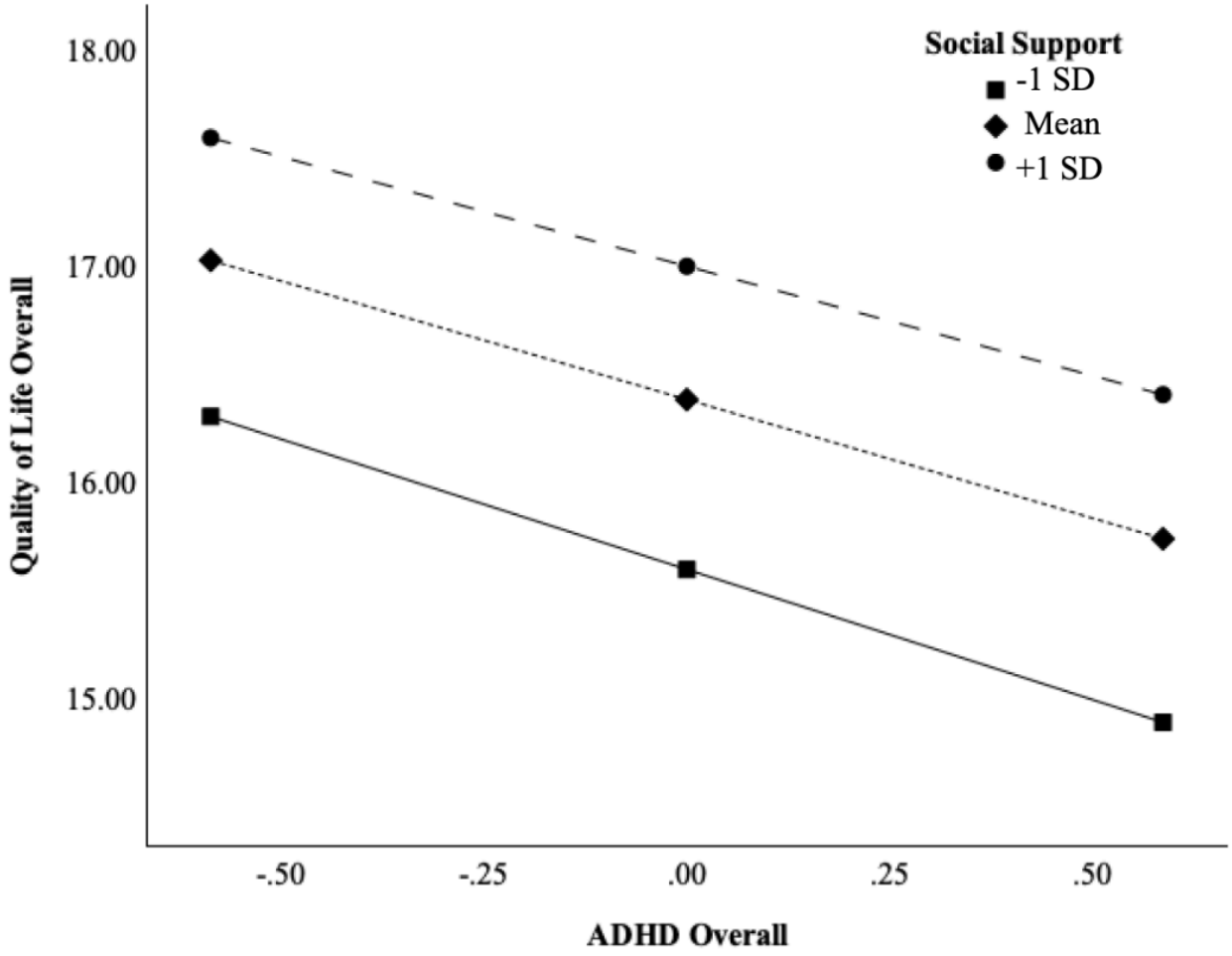


Figure 8

Overall Resilience as a Moderator of Treatment Satisfaction and ADHD