Heal-Thy Brain: The Intersectionality of Race, Sleep, and Socioeconomic factors in ADHD

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According to the National Institute of Mental Health (2023), Attention Deficit Hyperactivity Disorder (ADHD) has two primary presentations: an ongoing pattern of inattention or a hyperactivity-impulsivity that interferes with functioning or development, or both. ADHD is a neurodevelopmental condition with genetic factors but can be intensified by environmental influences. It is one of the most commonly diagnosed mental disorders in adolescence (Faraone et al., 2022). Sleep problems in youth with ADHD are reported to be in the range of 25% to 55% (Stein et al., 2022). Due to ADHD's complexity, the symptoms can be misunderstood or misinterpreted by the public. It is often not diagnosed before adolescence, families can often wrongly consider their children as "hyperactive", instead of their symptom being a form of hyperactivity from ADHD. However, only a small fraction of neurodivergence in adolescents are diagnosed in the United States. Currently, in the United States, about 6.1 million adolescents have been diagnosed with ADHD in the past two decades (Holland, 2018). Even with extensive data, there are still gaps regarding accurate diagnosis, including racial disparities, sleep disturbances, and socioeconomic factors. Additionally, the lack of ADHD diagnoses in adolescents can cause profound challenges in various areas of their everyday lives. For instance, Stein et al. (2022) have been seeing an increase in symptoms of insufficient sleep, as well as sleep disorders, among ADHD individuals. ADHD can contribute to the development of other sleep disorders in adolescents and young adults. Research suggests that children with ADHD are more prone to developing sleep problems than their neurotypical counterparts (Holland, 2018). Moderate to severe sleep problems occur at least once a week in 19.3% of the clinic-referred children with ADHD, 13.3% of the psychiatric controls (children taking stimulants), and 6.2% of the pediatric controls (children who are not taking stimulants) according to parents (Stein et al., 2022). ADHD is associated with lower sleep duration and a higher incidence of sleep disorders in adolescents and young adults, negatively impacting their school, work, and personal lives in more ways than one. This paper will examine the importance of sleep in individuals with ADHD, including exploring how cultural and socioeconomic factors shape sleep and other biological functions. The data collected will inform lifestyle changes for physical and mental health for those with ADHD, and also help shape approaches to sleep and health for others in the neurodivergent and the BIPOC communities.

Literature Review

Attention Deficit Hyperactivity Disorder has garnered a great deal of attention over the years due to recent discoveries about the disorder's impact on cognitive functioning. This has yielded numerous examples of the disorder being imprecise amongst various communities. Inaccuracy and underdiagnosis can induce unwanted stigmas and perplexity for individuals who are challenged with ADHD symptoms. Previous literature highlights how ADHD affects people of color disproportionately, and they may encounter extra challenges to diagnosis and treatment owing to prejudice, environmental factors, and their socioeconomic position. Because of these constraints, attempts to diagnose and treat ADHD have been severely disregarded. This review addresses how the intersectionality of race, socio-economic issues, and sleep can influence an ADHD individual's experiences and outcomes. Sleep disparities between African Americans versus Caucasians, sleep debt, cognitive performance, and periodic limb movement disorders will be extensively reviewed.

Throughout many academic studies discussing the symptoms of ADHD, the correlation between racial disparities and sleep impacting ADHD adolescents is overlooked. Various studies have found that Black and Hispanic children are less likely to be diagnosed with ADHD than white children, even when they have similar symptoms. The lack of diagnoses may be due to stereotypes about people of color as always being a part of a lower socioeconomic background, systemic biases, and a lack of awareness of ADHD in these communities. Buckhalt et al. (2007) investigate the correlation between African American and European American children's sleep duration and cognitive functioning. Their motives for inquiring on this particular subject stemmed from previous findings of studies on children's sleep hygiene and decreasing sleep duration. They also discussed how it was important to carry out a better sleep deprivation study for children, as the last few cases have been deemed ethically inappropriate for children. The researchers from this study used the work from previous research to find a correlation between sleep loss and the negative effects on working memory and executive functioning (Buckhalt et al., 2007). In particular, African Americans reported more nap times, oversleeping on the weekends, and sleep-disordered breathing. Methods used in this research were sample recruitments of calling parents from various zip codes to permit the use of their children in the study, and self-questionnaires such as the School Sleep Habit Surveys. The WJ III, a nine item test used to calculate and showcase intellectual abilities and cognitive abilities, was used. Of the nine tests, six were used: verbal comprehension (VC); concept formation (CF); visual matching (VM); numbers reversed (NR); auditory working memory (AWM); and decision speed (DS). These results showed that sleep and wake problems correlated to worse cognitive performance (Buckhalt et al., 2007). When asking teachers to report their academic performances, it was surprising to find out that race did not play a part in cognitive abilities, but socioeconomic status did. "This hypothesis rests on the assumption that African Americans (AA) and lower SES children are likely to be exposed to more stressors in their environment than their European Americans (EA) and higher SES counterparts, and that additional stressors (e.g., poor sleep in this study) may be related to lower levels of cognitive functioning" (Buckhalt et al., 2007). The most significant finding from the sleep survey was that bed-sharing/room-sharing had a significant effect on cognitive performance. In conclusion, race did not play a significant factor alone in cognitive ability, but the effect of economic status made an impact. Sleep disturbance comes from environmental factors like noise from bed sharing/room sharing, money stressors, and family issues. Children who have higher SES have the privilege of living less restricted and can focus better. "Poorer sleep in low-SES individuals may be related to a variety of factors, including work schedules, overcrowded households, chronic stressors associated with scarcity of resources,

diet and alcohol consumption, and even poorer temperature control in the sleep environment" (Williams, 1999). Further research needs to be done to look at health disparities in African Americans and low SES children. The research on two-parent households and sleep duration needs further investigation. Overall, the study showcased the urge to better support and advocate for those who come from a low SES to enhance their sleep quality.

Fox et al. (2007) posits that many people suffer from insufficient sleep. This insufficiency is also known as sleep debt. The researchers' exegesis of the expression "sleep debt" refers to individuals having to reimburse their sleep hours over time. For example, it is recommended that people obtain eight hours of sleep every night; thus, if they only reported receiving five hours of sleep, their sleep debt would be three hours. Due to the accelerated lifestyle many individuals have to maintain to survive, Fox and colleagues investigate if age, race, and socioeconomic status display how sleep debt alters everyday life. The methods used were conducted from the Public Health Management Corporation Community Health Survey dataset. Three questions were asked of 10,000 households residing in Pennsylvania in the following counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia counties. These counties were chosen by Random Digit Dialing to participate in telephone interviews given in either English or Spanish. Participants were asked questions about their sleep quality, quantity, and need (Fox et al., 2007). It was indicated that underrepresented populations have the most sleep debt; primarily African Americans and Latina women. Participants' stress levels could be assumed from dealing with systemic racism and longer work hours than their White counterparts. Participants with a psychiatric disorder were also associated with increased sleep debt. In correlation to age, it was noted that the older the individual was, the shorter their sleep latency (the amount of time it takes to fall asleep) was, but they had less sleep debt (Fox et al., 2007). The study also discusses the qualities between men and women: "Female respondents were also more likely than males to carry a sleep debt of at least 1 hour (58.8% for females vs 47.5% for males)."These findings gave valuable insight into identifying sleep debt in large populations, mostly emphasizing the effects of sleep disparities in minority groups.

Williams et al. (2016) compared and contrasted sleep between Black and White Americans. The research showed how African Americans and non-Black Hispanics had more physiological symptoms hindering their health than their Caucasian counterparts. To test their results, the researchers used the Behavioral Risk Factor Surveillance System and self-reported surveys to emphasize various sleep durations from the participants. They found other factors such as the internet and economic factors to be key variables of the differences in sleep between the two populations. Overall, they concluded that African Americans are more vulnerable to physical and mental health risks when it comes to sleep.

In addition to the understanding of the correlation between diverse populations and ADHD, Slobin and Masalha (2020) express their insights on how different ethnic populations value children's care while dealing with the diagnosis of ADHD. Throughout their literature, the researchers provided their initiative to showcase how access to mental health, stigmas, and treatment influences the adaptive strategies of children with ADHD. In their methods, the databases PsycINFO, Entrez-PubMed, and PsycARTICLES were used to provide the data. Identifying a barrier to access to mental health, Slobin and Masalha (2020) noticed that teachers often dismissed ADHD symptoms in minority children for disruptive behavior. This causes concern as most of adolescence is spent in a classroom setting, meaning teachers are vital in observing the true behaviors of children. These biases often can affect the child's identity and portray their characteristics as "bad" instead of as neurodivergent tendencies. Additionally, this can cause room for error in accurate diagnosing by mental health providers, as well as deviate individuals from receiving any help at all when they are older. The stigma alone raises different attention and acceptance in the communities. In regard to the lack of education about neurodivergence in ethnic communities, Slobin and Masalha (2020) identified that people of color responded to their child's behavior as more adverse than Caucasian parents, who saw their child's behavior as something to seek support for. African American parents were more likely to refer to their child's condition as a behavior problem or as an inherent characteristic implying that the child was "bad," whereas most Caucasian parents referred to it as a medical syndrome (Slobin and Masalha, 2020). The researchers discussed these responses from different backgrounds that can affect the treatment outcomes for children with ADHD. If a child's neurodivergence is considered "bad," this can result in more conduct reports and possibly being labeled as a miscreant. If their behavior is labeled as a "syndrome," more emphasis on seeking mental health treatment and alleviating symptoms is seen to support those types of ADHD individuals. Limitations include the data being "nonexhaustive" and being limited to mostly data from Caucasians and African Americans. The review gives an understanding of how better education is needed to help not only destigmatize the diagnosis of ADHD, but make health care inclusive to all neurodivergent individuals.

Craig et al. (2020) investigate how sleep disruptions might increase current ADHD symptoms, making it more difficult for youngsters to control their behavior and execute everyday tasks. ADHD is frequently linked with considerable functional impairment, such as difficulty with attention, executive function, and emotional regulation, which can have a negative influence on a child's daily life and create long-term consequences. Furthermore, children with ADHD and multiple sleep problems (e.g., bedtime resistance, waking up, tossing/turning in bed) have been shown to have more caregiver deficits and poorer quality of life, family functioning, and school attendance than children without sleep problems (Sung et al., 2008). There were three questions the researchers sought to answer: What are the characteristics of sleep disorders in a clinical sample of ADHD youth? What is the association between inattentive and hyperactive/impulsive symptoms, as reported by parents and teachers, and sleep issues in a clinic-referred sample of kids with ADHD? Do sleep problems, in addition to ADHD symptoms, contribute to functional impairment? Craig et al. (2020) study how sleep disturbances may exacerbate existing ADHD symptoms, making it more difficult for children to manage their behavior and complete daily chores. Using these considerations, Craig et al. (2020) set out to research potential therapies that may enhance sleep quality and overall outcomes for children with the illness. The researchers used methods such as recruiting parents of 192 children with ADHD, who completed measures regarding their children's ADHD symptoms, including the Pediatric Sleep Questionnaire, and Child Health Illness Profilend functioning (Weiss Functional Impairment Rating Scale–Parent Report)As a result of the methods, they were able to suggest that sleep disorders associated with children with ADHD did have a significant impact on their functional impairment. This suggests a link between the severity of ADHD symptoms and the risk of sleep issues. The discovery that sleep variability is connected to the other sleep abnormalities observed in ADHD lends credence to the theory that sleep issues and ADHD may be biologically associated, with disruption of the circadian rhythm, arousal, and sleep/wake transitions (Imeraj et al., 2012). All of these variables combine to create a vicious cycle of sleep disruption and ADHD symptoms, which can have a detrimental influence on a child's academic performance, social relationships, and overall quality of life.

Conclusively, Dr. Sara Frye and her colleagues (2018) conducted research to determine how physical variables affect ADHD patients. The goal of this study was to look into the effect of periodic limb motions on the behavioral performance of teenagers with Attention-Deficit/Hyperactivity Disorder (ADHD). Prior

studies revealed that people with ADHD had a higher risk of a movement problem called Periodic Limb Movement Disorder. This condition affects 26% to 64% of people (Frye et al., 2018). Furthermore, a random sample of 421 teenagers self-diagnosed by their parents was recruited as study participants. The researchers employed clinical history, neuropsychological assessments, physical examinations, a child or adult behavioral checklist, and a nine-hour polysomnography as methodologies. The findings revealed that adolescents with ADHD had a greater risk of developing PLMS than persons with PLMS alone. Additionally, the researchers discovered that PLMS may be a crucial trigger in the development of anxiety and mood problems in ADHD patients. More research is required to help these people suffering from PLMS. One limitation was that the study was cross-sectional, and there were not enough meaningful findings for people who don't have ADHD with PLMS alone or neurobehavioral outcomes. Additionally, there were self-reports of ADHD from parental observation that showed the findings should be approached with caution. Based on the study's findings, it is critical to continue learning about adolescents with ADHD and PLMS.

With many of the findings on ADHD resulting in the "how" and "why," this literature explores the possibilities of the effect of nature versus nurture on ADHD. The current challenge in coping with ADHD is explaining the underlying causes. Many individuals with ADHD do not showcase the common symptoms of fidgeting, impulsivity, or being severely absent-minded at a glance, making it challenging for society to see them as neurodivergent due to their abilities to adapt to social norms. Despite ADHD being genetic, environmental factors can exacerbate symptoms. After a diagnosis, most people assume and focus on the A in ADHD, attention. Many more symptoms that need to be discussed when dealing with ADHD are hindering daily activities. Additionally, the "why" for explaining ADHD is not thoroughly discussed and collected before diagnosis. For example, people of color who might face microaggressions regularly can have their ADHD mostly show up as anxiety which won't show up at all due to them having to mask their emotions out of self-protection. Adolescents coming from lower SES backgrounds who might have sensory issues due to noise from living in a crowded house or neighborhood can be misdiagnosed with another disorder/deficit and not get the proper treatment needed. ADHD can be complex. It is essential to have accurate diagnoses and more education on coping mechanisms. The current tactics for diagnosing ADHD come from a surplus of diagnoses from the COVID-19 pandemic, and the diagnosis of common symptoms expressed above is the ultimate explanation for ADHD

Conclusion

The preceding literature review emphasizes the importance of seeing ADHD from a holistic viewpoint instead of interpreting it only from diagnostic measures. It demonstrates the need for examining ADHD beyond genetic factors. The previous research highlighted that the effects associated with ADHD are much more than just genetics. The literature encompasses a broader perspective, including societal factors and lack of provider education when discussing ADHD in various populations. Furthermore, the literature review enhances this research to accentuate the importance of lifestyle factors exacerbating ADHD symptoms. To ensure the overall well-being of neurodivergent individuals, clinicians have a responsibility to provide accurate diagnoses. Diagnosing neurodivergent individuals comes with significant accountability and a need for accuracy to ensure people with ADHD experience satisfaction. To improve the outcomes across intersections of people with ADHD who experience poorer sleep, lower SES, and racial disparities, improved education on diagnosing is imperative. With better sleep hygiene, inclusive access to neurodivergent support from health care providers, and more advocacy in marginalized communities, the way of life for individuals with ADHD can feel less daunting while maintaining societal norms.

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