

How and Why Do Race and Gender Affect ADHD Diagnosis Levels?

Caitlin Bennett

Department of Psychology, Arcadia University

PY491: Senior Seminar II

Professor Ilze Nix

Feb 20, 2023

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Attention-deficit hyperactivity disorder (ADHD) is a disorder of the brain that impairs one's daily functioning and focus. Previous research has shown that two groups are disproportionately under-diagnosed: females and Black people. It is important to understand why these groups, and possibly others, are under-diagnosed as those without a diagnosis do not get the treatment that they need. Literature reveals that differences in symptom presentation (inattentive vs. hyperactive), biases in symptom reports, barriers to accessing mental healthcare, and negative stigmas about, and within, certain groups lead to the under-diagnosis of females and Black people. In conclusion the diagnostic criteria of ADHD needs to be reviewed and revised to account for the under-diagnosis of these two groups. Past research states that objective measures, unaffected by bias, should be used more often in the diagnosis process as bias can further exacerbate this under-diagnosis. This is because bias could lead to an inaccurate report of symptoms, which could lead to an individual not getting a diagnosis even when they have ADHD. In addition to that, the healthcare system needs to be reformed when it comes to mental healthcare in order to break down those barriers that are keeping people from getting the support and treatment that they need.

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What is ADHD?

Attention-Deficit Hyperactivity Disorder (ADHD) has become a popular topic in recent years, as more and more people are receiving diagnoses (Fairman et al., 2020). With that ADHD diagnosis individuals are able to get the treatment and support that they need to help them reduce their symptoms. Despite this, there are still groups of people that do not get that diagnosis that they so desperately need. Without that diagnosis they cannot get the treatment that they need, which is quite important seeing that ADHD impairs one's daily functioning and overall success in life. According to the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition, Text Revision (DSM-V TR), "The essential feature of attention-deficit/hyperactivity disorder (ADHD) is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development." (APA, 2022, p. 70).

ADHD impairs functioning. It can interfere with one's social, academic, and occupational life. Children with ADHD are more likely to perform poorly in school. Teachers may view them as bad students because they have trouble focusing and may turn in their homework late or incomplete. Adolescents and young adults with ADHD have similar academic problems, along with poor job stability (APA, 2022). They have trouble keeping a stable job because their symptoms can negatively impact their performance at work. ADHD can have a negative impact on an individual's social life as well. Individuals with ADHD are often avoided or teased by peers, especially if their symptoms are more hyperactive-impulsive. This can lead to self-esteem issues. It can also cause rifts between the diagnosed individual and their family members. A major issue is that, "Children with ADHD are significantly more likely than their peers without ADHD to develop conduct disorder in adolescence and antisocial personality disorder in

adulthood, consequently increasing the likelihood for substance use disorders and incarceration.” (APA, 2022, p. 73).

Substance Abuse Likelihood

Undiagnosed mental disorders have a higher likelihood, than diagnosed disorders, of leading to a Substance Use Disorder (SUD), due to people trying to cope with their symptoms. Some may use alcohol, weed, nicotine, etc to manage their symptoms. To no surprise, girls with ADHD have a higher probability, than their male (ADHD) counterparts, of using substances to cope and they have a higher risk of developing an SUD as well. Girls' high levels of cognitive impulsivity and low levels of executive functioning can lead to substance use, which may only worsen their condition. This is all due to the fact that they often go undiagnosed and if they do get a diagnosis, it is usually later in life (Castellano-García et al., 2022). This is an issue because people need to be getting the proper treatment that they need instead of turning to other, possibly harmful means, to cope with their impairing symptoms.

Subtype

ADHD can be broken down into three different subtypes: predominantly inattentive, predominantly hyperactive-impulsive, and combined. Previous research shows that girls typically manifest the predominantly inattentive subtype, whereas boys typically manifest the predominantly hyperactive-impulsive subtype (Fresson et al., 2019; Klefsjö et al., 2020; Mowlem et al., 2019ab; Slobodin & Davidovitch, 2019). The inattentive subtype is characterized by more internalized symptoms (e.g., problems with focusing) and the hyperactive-impulsive subtype is characterized by more externalized symptoms (e.g., problems with staying still in situations where it is required). Something interesting to note is that girls with the hyperactive-impulsive subtype are more likely to be diagnosed and treated. Externalized

symptoms seem to be the main factors that clinicians, teachers, parents, etc look for when assessing if the child in question might have ADHD. This leads to those with the inattentive subtype to be overlooked as one would not really notice their symptoms just by observing them (Mowlem et al., 2019b). There are neurological factors that lead to this difference in presentation.

ADHD in the Brain

Magnetic Resonance Imaging (MRI) is often used when researching how a mental disorder affects the brain. In this case, the effects of ADHD on the brain were looked at in girls and boys, with non-ADHD girls and boys as the controls. Both girls and boys with ADHD have a smaller overall brain volume than the controls. In addition to that, girls' posterior inferior cerebellar vermis have a smaller volume. The cerebellar vermis works with the oculomotor system, which deals with executive functions, memory, language, etc. ADHD negatively affects executive functioning; therefore, it negatively affects the cerebellar vermis, hence why its volume is smaller in girls with ADHD. In addition to that boys have a smaller cerebellum, right globus pallidus, and right anterior frontal region. (Castellanos et al., 1996; Castellanos et al., 2001).

Furthermore, the corpus callosum, found in the center of the brain, connects the two hemispheres together. It is made up of white matter and has four parts: the body, the splenium, the rostrum, and the genu. The main job of the corpus callosum is to exchange information between the hemispheres in order to process information: motor, sensory, and high level cognitive indicators (Goldstein et al., 2022). ADHD has the potential to affect all those functions mentioned above so, of course, the corpus callosum plays a role in ADHD. The size of the corpus callosum was looked at in individuals that have ADHD and individuals that do not. Those

with ADHD have a smaller splenium compared to those without ADHD. Furthermore, the smaller splenium was more pronounced in girls, while boys also had a smaller rostrum. The splenium is in the rear of the corpus callosum and has connections to all of the cortexes of the brain, besides auditory. Most importantly it is in communication with the parietal lobe, which deals with attention. This could explain why females are more likely to have the predominantly inattentive subtype of ADHD. Now the rostrum is located at the front of the corpus callosum, and it communicates with the frontal lobes, especially in regards to motion. This could explain why males are more likely to have the predominantly hyperactive-impulsive subtype (Hutchinson et al., 2008).

The Problem

The typical model of someone with ADHD is a white male (Fresson et al., 2019) with a higher socioeconomic status (SES), (Bergey et al., 2022); however, there are other groups that fall prey to this disorder that are being overlooked due to this fact. Not only does this cause bias in the diagnostic process, but it also leads to the under-diagnosis of certain groups. A lack of diagnosis leads to a lack of treatment, which is crucial when it comes to ADHD as this disorder impairs one's daily functioning. This "typical model" of ADHD has led females and Black people to be consistently under-diagnosed when it comes to ADHD. The current male-to-female ratio is, "2:1 in children and 1.6:1 in adults." (APA, 2022, p. 72). Furthermore, diagnosis rates are lower for Black people than their white counterparts (APA, 2022). The factors contributing to the under-diagnosis of ADHD in females and Black people will be explored.

Overdiagnosis of Males and White People

White males are the typical representors of ADHD. They usually have the hyperactive-impulsive subtype, which includes more externalized symptoms. Whereas, girls

typically have the inattentive type, which has more internalized symptoms. Externalized symptoms are easier to spot than internalized ones. Psychology students were asked to watch a video of a child doing certain activities. They only knew the gender and were asked to assess the child's behaviors and fill out a questionnaire after viewing. The psychology students rated the child's behaviors more severely if they thought the child was a boy. Gender stereotypes can cause a gender bias in the assessment of boys by evaluators, which leads to the overdiagnosis of boys (Fresson et al., 2019; Mowlem et al., 2019b).

Parents of Black, Latino, and white kids answer questions from the Diagnostic Interview Schedule for Children Predictive Scales (DPS) about their child's possible ADHD symptoms. They were also asked if their child had ever received an official diagnosis of ADHD and if they ever received medication for it. The children were observed in 5th grade, with follow-ups in 7th and 10th grade. The results discovered that the Black and Latino kids were less likely than the white kids to have ever received an ADHD diagnosis. Additionally, they found that white kids were more likely than Black and Latino kids to have received treatment for their diagnosis (Coker et al., 2016). The racial inequalities of ADHD diagnosis were also looked at, but the children were observed from kindergarten to 8th grade. Findings showed that Black (and Hispanic and Asian) children were less likely to have a diagnosis of ADHD than white children (Morgan et al., 2013).

Stereotype Threat

Another factor contributing to the overdiagnosis of boys is stereotype threat. Boys and girls, between the ages of 8-10, were informed of the stereotype that boys are typically impulsive and inattentive. Afterwards, they completed several cognitive/neuropsychological assessment tasks. Questionnaires about the child's behaviors were sent out to the parents to control for the

potential behavioral and cognitive differences between the children. The children also filled out a self-assessment for their “attention problems”, and they also filled out a stigma consciousness scale before the cognitive tasks. After the tasks, they filled out a stereotype endorsement scale and a motivation scale. They found that stereotype threat, gender, and stigma consciousness negatively affected boys' scores on the neuropsychological tasks. This leads to the overdiagnosis of males because they could have only done poorly due to the reminder of the negative stereotype and not because they actually have ADHD, or any of its symptoms (Fresson et al., 2019). Stereotype threat is also seen in the Black community when it comes to mental health, which will be discussed in depth later.

The Prevalence of ADHD in Black People

Through a meta-analysis of 21 studies, it was discovered that Black people are actually more likely to be diagnosed with ADHD than previously believed. This is due to the fact that Black people are a minority group in the United States, which leads to them being “underrepresented in studies evaluating ADHD.” (Cénat et al., 2021, p. 21). Furthermore, the prevalence rates of ADHD in 956 college freshmen were looked at. Students were asked to fill out a Student Response Inventory (SRI) about themselves and their symptoms. Their parents were asked to fill out a Parent Response Inventory (PRI) to gather information about the student's possible symptoms from when they were younger. The questions on the inventory came from the ADHD section of the DSM-IV. The findings indicated that Black students were more likely than white students to have ADHD. The Black students had higher percentages for all three subtypes (inattentive, hyperactive, and combined) than their white counterparts (Lee et al., 2008).

It is good to know that Black people may actually have a higher rate of ADHD than white people; however, they are still subject to not getting a proper diagnosis. This becomes a major issue because Black people might be the majority when it comes to ADHD; which in turn could change how we view, diagnose, treat, etc. this disorder, but we do not know for sure because of this disproportionate under-diagnosis blockade. We only have a few glimpses into that possibility through this previous research.

One theory behind the under-diagnosis of these groups explains that it could be due to the possible overdiagnosis of males and white people.

Symptom Presentation

Age of Onset/Diagnosis of ADHD

One reason why females go under-diagnosed with ADHD is due to the fact that they present their symptoms differently than boys do, which can make it more challenging to identify ADHD in girls. The gender differences in the diagnosis process of ADHD were looked at through a sample of 100 boys and girls that went to an outpatient for help with their disorder. Girls were older than boys at their first visit and at the eventual diagnosis. In addition to that, it took girls longer than boys to get a diagnosis of ADHD (Klefsjö et al., 2020). Girls being diagnosed later in life brings back that substance abuse likelihood back into the playing field. They may not understand or see their symptoms as those that belong to ADHD; and therefore, turn to harmful substances to cope with their disorder because they do not know what is “wrong” with them.

Gender Differences in Symptom Presentation

It is known that girls are more likely predominantly inattentive while boys are predominantly hyperactive-impulsive. However, among diagnosed boys and girls, it is worth

noting that girls were referred to an outpatient clinic for emotional problems but boys were referred for neurodevelopmental problems (Klefsjö et al., 2020). These referrals are most likely to be done by parents and teachers who also submit their reasonings for said referral. When parents were asked to rate ADHD symptom probabilities between genders, they rated boys higher than girls when it came to more hyperactive-impulsive symptoms (excessive talking, running around, fidgeting, etc). The teachers rated similarly to the parents (DuPaul et al., 2020). Parents and teachers were asked to read vignettes, either about a boy or a girl, then rate their likelihood of referring that child to mental help services for their ADHD symptoms. Boys were found to be referred more often than girls. This was due to the belief that boys would benefit more from these help services than girls. However, when girls displayed more hyperactivity, teachers and parents were more likely to refer them to services than girls with more inattentiveness (Ohan & Visser, 2009). One can see that hyperactive-impulsive symptoms seem to be the driving factor for an ADHD diagnosis/referral, which is an issue as there is a whole other subtype with symptoms that are displayed less outwardly. While it is much easier to spot externalized symptoms, these inattentive symptoms deserve just as much attention and treatment, if not more, than the hyperactive ones.

Neuropsychology looks into how the brain affects how we function. Male and female adolescents completed numerous tests that assessed their neurological/executive functioning: memory, reading, response inhibition, processing speed, etc. Girls had more issues with memory, whereas boys had more issues with the Stroop task and Continuous Performance Test (CPT). This is consistent with the finding that girls are more inattentive and boys are more hyperactive-impulsive (Rucklidge, 2006).

Biases During the Diagnostic Process

Subjective vs. Objective Measures

When it comes to looking at and diagnosing ADHD there are subjective and objective measures involved. Subjective measures are usually susceptible to bias as they are completed by humans that have implicit and explicit biases. Objective measures, on the other hand, are not susceptible to bias because humans are not involved. In regards to ADHD, one of the objective measures that is typically used is the Continuous Performance Test (CPT), which measures all the symptoms of ADHD (inattentive and hyperactive-impulsive). The CPT is unbiased as it was established on scientific research, rather than human bias like the subjective measures. The Conners ADHD Rating Scales, the Child Behavior Checklist (CBCL), and Teachers Report Form (TRF) were looked at and compared to the CPT when it came to measuring and rating ADHD and its symptoms. The Conners ADHD Rating Scales, CBCL, and TRF are all subjective measures due to the fact that they rely on parental and teacher reports. The subjective measures found that inattention was higher among girls than boys, however, no significant differences between genders were found for hyperactivity-impulsivity. The objective measure found that boys scored higher for hyperactivity-impulsivity than girls did, which is consistent with previous research. These findings suggest that different measures assess specific ADHD symptoms differently and that this could be due to gender difference in symptoms. The biases, specifically with gender, of parents and teachers could also be at play here (Slobodin & Davidovitch, 2019).

Clinician Bias

In order for a child or a minor to get a clinical diagnosis of ADHD, one typically needs a clinician evaluation, a report from a teacher, and a parent report. Therapists were given case vignettes of either a boy or girl that did or did not fit DSM-IV and International Classification of Diseases, Tenth Revision (ICD-10) diagnostic criteria for ADHD. They were asked to fill out a

questionnaire and diagnose the child in the vignette. The therapists diagnosed boys more often than girls. Clinician bias is at play here because many of them adhered to their own biases about ADHD instead of the actual diagnostic criteria. They were more likely to diagnose a boy than a girl, even if their symptoms were the exact same. This indicates that they are relying on a representativeness heuristic, which is when someone uses a mental or well-known shortcut when assessing or estimating something. In this case, boys are the typical representatives of ADHD, which leads therapists to overlook certain exclusion criteria. This is where overdiagnosis and under-diagnosis happens (Bruchmüller & Schneider, 2012). Teachers may also be at risk of conforming to their own biases as well.

Teacher Bias

Teachers have been found to have bias when it comes to diagnosing and/or reporting ADHD and its symptoms. When teachers were asked to rate ADHD symptoms and the likelihood of it being diagnosed they rated Black boys' ADHD behaviors and likelihood of having ADHD higher than the white kids and girls. Furthermore, their ratings were higher than Black parents' (Kang & Harvey, 2020). Other research had similar results when parents and teachers rated the ADHD symptoms of elementary-aged children. The teachers rated Black children as having higher levels of both symptom types (inattentive and hyperactive-impulsive) than their white classmates (Lawson et al., 2017). In addition to that, Teachers read vignettes about boys and girls with different subtypes of ADHD and then rated the child's impairment and then referred them to a treatment option. The teachers rated girls with the hyperactive-impulsive subtype as more impaired than boys with that subtype. In fact, they rated hyperactive-impulsive girls as the most impaired overall. As for the inattentive subtype, teachers rated girls as the least impaired. This becomes an issue because children with the inattentive subtype, which are mostly

girls, are being overlooked (Coles et al., 2012). Parental bias could also be at play within the diagnostic process of ADHD.

Parental Bias

The reliance on parent reports within the diagnosis of ADHD can be problematic, as parents may not always accurately assess and observe their child's level of impairment. This is particularly true for girls with ADHD, who typically have more internalized and emotional symptoms that are not as easily noticed by parents (Mowlem et al., 2019a). Furthermore, it was found that Black parents, who had more experience with racial discrimination, rated Black boys' symptoms and likelihood of a diagnosis higher than the white kids and girls (Kang & Harvey, 2020). These parent, clinician, and teacher reports are known as subjective measures and they are quite prone to bias, which is an issue.

Racial Bias

Racial bias is another damaging factor that is unfortunately at play when it comes to diagnosing ADHD. This is yet another bias that interferes with the diagnosis process. We already know that Black parents, who have had more run-ins with racial discrimination, rated Black boys' symptoms and likelihood of a diagnosis of ADHD higher than the other children in that study (white boys and Black and white girls). We also know that when teachers were asked to rate the same thing, they rated similarly to the Black parents. Teachers were also asked to disclose their racial biases toward Black people and there was a correlation between their biases and their ratings of the children. Those with more negative biases rated the Black boys' more severely than the other children in the study (Kang & Harvey, 2020). It is shown here that people's racial biases come out during assessments like this, whether they are aware of it or not.

This is yet another reason why objective measures are necessary in the diagnosis process due to the fact that human bias can negatively interfere with assessing and diagnosing ADHD.

Barriers to Accessing Mental Health Care and Treatment

Socioeconomic Status

Systemic racism is when racism is embedded into the laws, ideals, etc. of a country or region. One can see it in the United States of America as Black people are often at a disadvantage in many areas. One of those areas being class level: Black people, in the United States, generally have a lower socioeconomic status (SES) than other races, which is due to systemic racism. SES has a significant impact on the diagnosis of ADHD in Black people (Bergey et al., 2022). Low SES often results in limited access to quality healthcare, including mental healthcare. People in low SES areas and families may not have the financial resources or means to receive a diagnosis. Additionally, these areas may not have the necessary resources to provide a diagnosis, and families may need to travel long distances to find a place that will give them a clinical diagnosis. It is known that children within a family that has lower SES are more likely to be diagnosed with mental disorders (Bergey et al., 2022), like ADHD; however, this does not mean that they are actually getting that diagnosis.

The relationships between ADHD, SES, ethnicity, and race were researched through a data collection of parent and teacher reports for ADHD (according to DSM criteria) and reports of SES and race. The findings were based on parent and teacher ratings/reports along with clinical ADHD diagnoses: once again Black children, and other races (Hispanic and Asian), were a lot less likely to be diagnosed with ADHD than white children. The researchers believed that there were numerous reasons behind this including a lack of trust for the healthcare system and those that are apart of it, lack of access to mental health care resources including transportation

to said resources, biases within the healthcare system, and lack of information about mental health and health care (Bax et al., 2019).

Ratings of attention-deficit hyperactivity disorder symptoms are also influenced by socioeconomic status. Parents and teachers rated the ADHD symptoms of elementary-aged children, and socioeconomic status was obtained from the parent reports. The ratings were then looked at and compared to the SES and race of the children in the study. A low SES was linked to more hyperactive-impulsive symptoms in both parent and teacher ratings. When it came to inattention, low SES was also linked to high levels of these symptoms but only for teacher ratings. This could be attributed to teachers having children do more focus-based tasks compared to parents (Lawson et al., 2017). This finding clearly displays that SES has a mediating role in the ADHD diagnostic process as it affects the way that teachers and parents rate ADHD symptoms of children with different SES. This research has allowed us to see a glimpse of how complex SES and its relationships with other factors really are.

Health Insurance

Believe it or not, health insurance is another barrier to accessing proper mental health care and treatment. There are two main insurance categories in the United States: public and private. Public is usually cheaper than private and is provided by the government. It is normally provided to low income families. Private insurance, on the other hand, is more expensive and is not provided by the government. Additionally, public insurance is more strict than private when it comes to medical service providers. To no surprise, those without insurance have the least access to receiving an ADHD diagnosis and treatment (Stevens et al., 2005). We remember that Black people typically have a lower income, which can lead them to only be able to afford public insurance. Which in turn, leads them to having less access to good medical service providers.

They then end up back in the same place as before, with a lower rate of being clinically diagnosed with ADHD (Bergey et al., 2022; Siegel et al., 2016). In the case where the individual is diagnosed with ADHD, they are less likely to receive treatment if they have public insurance than if they have private insurance (Stevens et al., 2005). In addition to all this, private insurance has access to private practices including psychiatrists, whereas public insurance only has access to health practitioners, who do not always have the necessary tools and information to give an accurate psychiatric diagnosis (Siegel et al., 2016).

The Stigmatization of Black People

One other barrier is that mental health is a taboo topic in the Black community. Racial discrimination and the negative stigmas that are associated with mental health issues are some of the leading contributors to this taboo. Mental health is a sensitive subject for Black people, and because of the long-standing history of discrimination against Black people and their communities, many individuals choose not to seek help or even talk about their own or their child's mental health (Cénat et al., 2021; Kang & Harvey, 2020). Black parents, who are all too familiar with the systemic racism and discrimination that exists in our society, have often chosen to overlook or even completely ignore the ADHD symptoms and tendencies of their own children in an effort to protect them from any potential discrimination or judgment based on their race and condition. They are also conscious of stereotype threat by not taking their child to get diagnosed out of fear of confirming one of the many negative stereotypes about Black people. This is an unfortunate reality for many Black families, who are all too aware of the potential repercussions of such a diagnosis (Cénat et al., 2021). Once again, when it came to rating the likelihood of an ADHD diagnosis and ADHD symptoms in Black and white boys and girls, Black parents rated the Black boys higher when they had more experience with racial

discrimination (Kang & Harvey, 2020). The negative stereotype that Black boys are loud, disruptive, etc. can negatively affect an ADHD diagnosis. One could observe a Black boy who actually has ADHD and not refer them for a diagnosis because they believe that is just how Black boys act, and vice versa.

Stigma and Help-Seeking

Negative stigmas around mental health have a big impact on the Black community, and many within it may not seek mental help out of fear of confirming those stigmas. Additionally, we know that talking about mental health and seeking help for it are rare occurrences in the Black community. When stigma type and target were looked at, self-stigma within the parents was the biggest reason for Black parents to not seek help for their child with a mental disorder or behavioral problems. They are fearful that they will be blamed for their child's issues, especially if they are affecting the child's functioning, like within ADHD (Dempster et al., 2015).

Limitations

The biggest limitation that permeates this subject is the lack of research due to small sample sizes. Previous and current studies usually have a small sample number of females and Black people, which leads to a lack of understanding of ADHD in those groups and the inability to use findings as concrete evidence (Mowlem et al., 2019a). It is a constant cycle of not being able to fix the problem of under-diagnosis because we struggle to find enough people to research from these under-diagnosed and under-researched populations. Another big limitation is the use of self, parent, clinician, and teacher report when it comes to diagnosing ADHD. These types of reports are subject to bias, which could interfere with the diagnosis process (Kang & Harvey, 2020; Mowlem et al., 2019a; Lawson et al., 2017; Bruchmüller & Schneider, 2012; Coles et al., 2012).

An additional limitation is the use of vignettes (Bruchmüller & Schneider, 2012; Ohan & Visser, 2009; Coles et al., 2012). Vignettes do not hold the same weight as a real life situation so whoever is reading the vignette and diagnosing, referring, etc. may not take it seriously because there are no consequences if you “answer wrong”. Furthermore, vignettes do not allow for further research/questions about the situation displayed in the vignette; whereas, in real life more questions can be asked and further research can be conducted (Bruchmüller & Schneider, 2012). In addition to that, some of these studies were conducted in different countries (Bruchmüller & Schneider, 2012; Klefsjö et al., 2020). We might not be able to apply findings from these studies to other countries. It depends on the way the study was conducted and the culture of the country the study was performed in. A further limitation was the use of ADHD symptom ratings instead of actual diagnoses. This is an issue because an individual can display symptoms of ADHD without actually having the disorder (DuPual et al., 2020).

This next limitation was only mentioned once throughout the previous research used here; however, it could be happening more often than we are aware of. When teachers were asked to rate and then refer a child based on their ADHD symptoms, they were not asked about how much knowledge they had on the disorder. This is a huge problem because if some teachers do not even have basic knowledge about ADHD and its symptoms, they could contribute even more so to the under-diagnosis of females and Black people. Without the knowledge of how ADHD works and presents itself, they could read about or observe the child's behaviors and symptoms, and think that nothing is wrong (Coles et al., 2012).

Future Directions

Biases During the Diagnostic Process

It is imperative that we find more objective, and less subjective, measures to detect ADHD. Objective measures, such as the Continuous Performance Test can provide more reliable and accurate assessments of ADHD symptoms, as they are not prone to bias (Slobodin & Davidovitch, 2019). In addition to using objective measures, efforts should be made to increase awareness and education among healthcare providers and the general public about the potential for bias in the ADHD diagnostic process. This can involve providing training to healthcare professionals on how to recognize and address their own biases, as well as educating parents and teachers about the importance of providing equal access to healthcare for all individuals.

Brain Imaging to Detect ADHD

With the findings of MRIs (Castellanos et al., 1996; Castellanos et al., 2001), and other brain imaging techniques, we could develop new ways to assist in detecting ADHD that are inclusive of all genders and races. More research on these brain imaging techniques must be done before that happens to ensure that MRIs, and the like, can accurately detect the brain abnormalities that ADHD causes in the brain. For example, the lighter volume of the posterior inferior cerebellar vermis in people with ADHD. Like the CPT, these techniques are immune to human bias and could be a helpful addition to the objective measures family. This would greatly aid in the diagnosis process as human bias has a huge negative impact on the diagnosis levels of ADHD.

Addressing the Under-Diagnosis of Females and Black People

Black people are disproportionately under-diagnosed, even though they are more likely to have ADHD than other races (Bergey et al., 2022; Cénat et al., 2021; Lee et al., 2008). This is likely due to a lack of awareness and understanding of ADHD and its symptoms in Black communities, which can often lead to misdiagnosis and inadequate access to proper mental

health care. This finding suggests that cultural and diversity considerations should be taken into account when re-evaluating the diagnostic criteria of ADHD. It is pertinent to consider the impact of culture and diversity when looking at the signs and symptoms of ADHD, as there may be significant variations in the presentation of symptoms across different cultural backgrounds. In doing so, it is ensured that the diagnostic criteria are as accurate and up-to-date as possible.

Additionally, females have a much higher rate of underdiagnosis than males (Klefsjö et al., 2020; DuPaul et al., 2020; Ohan & Visser, 2009; Mowlem et al., 2019ab; Bruchmüller & Schneider, 2012). It is well known that girls are more inattentive, while their male counterparts are more hyperactive-impulsive. It is also known that inattentive symptoms are frequently overlooked because they are hard to observe due to them being more internalized (Coles et al., 2012). We must find a way to better understand and detect these inattentive symptoms. They are accounted for in the DSM-V TR; however, during the actual diagnosis process they are forgotten about or ignored. We must do more research on this aspect within ADHD in order for the diagnostic criteria to adhere to said differences as well.

Racial Bias and Negative Stereotypes

Cultural education and awareness about cultural differences needs to be implemented. As we saw, racial bias and negative stereotypes play a harmful role in the diagnostic process of ADHD (Kang & Harvey, 2020; Cénat et al., 2021). Both of these factors can keep an individual from getting a diagnosis. Moreover, this is another reason why there must be more objective, and less subjective, measures when it comes to ADHD. That way, racial bias and/or negative stereotypes will not come up at all in the journey of getting a diagnosis.

Stigma and Help-Seeking

There are two new models of help that were created to reduce stigma's negative effects on parents', specifically Black, help-seeking for their child's mental disorder. The first one is the Patient-Centered Medical Home model, where parents work with the healthcare provider together. They develop a relationship, which has been an issue before because Black people typically do not trust mental healthcare providers. The provider listens to the parents' and child's needs and gives options on how to fulfill those needs. This reduces self-stigma within the parents because they themselves are working with the provider, instead of the provider telling them what to do without their input. The second model is one where parents receive tips on how to parent their child in a way that minimizes the symptoms of their disorder. It does not ridicule their previous parenting, just enhances their current parenting skills. This also reduces self-stigma as it does not place the blame on the parents (Dempster et al., 2015).

SES Effects on ADHD Diagnosis

Families with low socioeconomic status often lack access to the proper mental health care that they need to accurately diagnose and treat the disorder (Bergey et al., 2022; Coker et al., 2016; Lawson et al., 2017; Bax et al., 2019; Morgan et al., 2013). This means that a large portion of those who could benefit from an ADHD diagnosis and treatment are not properly identified and supported, leading to a significant gap in mental health care for people from low-income backgrounds. This lack of access to health care can have serious consequences, as individuals may go without the necessary treatment that could help them manage this life-impairing condition and go on to lead successful lives. Therefore, it is crucial that health care providers make efforts to increase awareness of ADHD symptoms and how other cultures view ADHD, and provide access to adequate mental health care for all individuals, regardless of socioeconomic status.

Conclusion

The under-diagnosis of females and Black people can lead to a lack of understanding about how ADHD may manifest differently in different populations. For example, symptoms of ADHD may present differently in these groups, making it more difficult to diagnose the disorder in them. This can lead to a lack of research and resources for these populations, further exacerbating the issue. It is very clear that the diagnostic criteria and tests used to detect ADHD must be revised and improved in order to ensure that everyone afflicted with this condition receives a proper, clinical diagnosis and the appropriate treatment and support. More research on ADHD in females and Black people needs to be conducted in order to adequately update the criteria used. This is especially true when it comes to the disproportionate diagnosis rates of ADHD in those two groups, who are particularly vulnerable to being under-diagnosed. It is crucial to make sure that adequate steps are taken to ensure that an accurate diagnosis and proper treatment is provided to all individuals, regardless of gender or race.

Despite all these negatives, previous research has shown that the diagnosis of ADHD in females and Black people has increased these past couple of years. More and more research on these two groups have contributed to this increase. Said research has led to the knowledge of the sex differences when it comes to the symptom presentation of ADHD and shown us what barriers to fix when it comes to creating access for all to mental healthcare. In addition to all that, we understand that cultural aspects must be included in the process of diagnosis when it comes to ADHD. Although, there is still a long way to go as the diagnostic criteria still mostly pertains to white males with a higher SES (Fairman et al., 2020).

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