“Look, a squirrel!” - Public perceptions of ADHD

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I. ABSTRACT

Attention-Deficit/Hyperactivity Disorder (ADHD) is underdiagnosed in women and girls. Misinformation and gendered stereotypes about the disorder cause symptoms to be overlooked, but research suggests that education can reduce bias surrounding the disorder. This study aimed to assess the level of knowledge and educate the Flintridge Sacred Heart Academy (FSHA) community about ADHD through a survey received by a sample of students and faculty (n=172). The survey included a 19 question true-false quiz of misconceptions about ADHD, with participants receiving explanations for quiz answers at completion.

II. INTRODUCTION

"Maybe you have ADHD." When my friend told me these words during my freshman year, I brushed them off. It was simply impossible for me to have ADHD: I had been an all-A student for years, I was not disruptive or troublemaking, and most importantly, I was not a 5 year-old white boy. I had an idea of what ADHD was and what it looked like, and as a woman of color, I did not fit that description. After stumbling on an article about ADHD in women the following year, those words came back to haunt me with a vengeance. I discovered that not only could women have ADHD, they are less likely to receive any kind of diagnosis or treatment, causing them to suffer in silence without the help that they need. With each new study I read, I realized how much I actually related to the symptoms, and how much the misconceptions I held affected my view of the disorder. A few months later, I received my ADHD diagnosis, and marveled at the prejudices that had kept me from getting a diagnosis for so long. Although I had learned more about ADHD and changed my views, I realized that many of the people around me

had not. I wondered how many other girls were being affected by these misconceptions and how I could help those in my community understand ADHD in women.

III. LITERATURE REVIEW

"A Review of Attention-Deficit/Hyperactivity Disorder in Women and Girls: Uncovering This Hidden Diagnosis," published in *The Primary Care Companion for CNS Disorders* in 2014, explains that because girls with ADHD often display more inattentiveness and less outwardly disruptive symptoms, their symptoms are overlooked and they are three times more likely to be underdiagnosed. The authors, Patricia Quinn and Manisha Madhoo, mention that girls are more likely to develop coping mechanisms that mask their symptoms, especially in academic settings, causing them to be seen as less severe. Girls with ADHD also experience low self-esteem, and higher rates of anxiety and depression, and without treatment, they can suffer from poor academic achievement and mental health. This article also describes a study in which parents and teachers were given identical scenarios of ADHD symptoms, but were less likely to refer the child for treatment when the scenario used a girl's name.

Published in *Frontiers in Human Neuroscience* in 2019, "Gender Differences in Objective and Subjective Measures of ADHD Among Clinic-Referred Children," much like the literary review cited above, demonstrates ways that gender biases factor into the diagnosis of ADHD. The study, written by Ortal Slobodin and Michael Davidovitch, compares symptom presentation/severity in the two components of an ADHD diagnosis: the subjective reports given by primary care doctors, parents, teachers, and the child; and objective tests, such as the Continuous Performance Test (CPT). The study found that in subjective reports, girls were labeled as more inattentive, but CPT results showed higher levels of inattention in boys. In addition, for most categories of the CPT, results were almost entirely unaffected by gender,

showing similar symptom severity for both boys and girls. This study implies that parents and teachers have a gender bias when evaluating ADHD symptoms, exacerbating the underdiagnosis of women, and that diagnosis should rely more on objective measures. Although this study establishes bias among parents and teachers, it does not mention any biases in the peers of those with ADHD.

Similarly, a study published by Fan et. al. in November 2022 in *Children* entitled “Do Parents of Children with ADHD Know the Disease? Results from a Cross-Sectional Survey” used a survey to determine parents’ opinions and knowledge of symptoms and treatments of ADHD in China. This study found that most of the parents held misconceptions and were underinformed about several facets of ADHD. Some common misinformed beliefs found in the study were that ADHD only occurred in childhood and that poor parenting and/or excessive sugar intake causes ADHD. This study also showed that most of the parents received information of ADHD on social media, not from medical professionals. The study recommends evidence-based education as a means of combating this misinformation, especially because parents are crucial in attaining diagnoses and treatment.

For my field visit, I conducted an in-person interview with Margot Paine, the academic services coordinator at FSHA. Ms. Paine works to coordinate accommodations for students with ADHD and other learning differences or disabilities, and regularly works with the parents and teachers of students with accommodations. When I asked about attitudes towards ADHD by the general population, she mentioned that through her experience, older generations typically have more negative, inaccurate views about the diagnosis, and many parents are “not comfortable with [her] pursuing looking into a student's learning.” In surveys that Ms. Paine conducted for students with accommodations last year, she asked how students with accommodations were

treated by their peers, and was pleasantly surprised to find mostly positive responses. This contrasts with past responses where she heard of students “[talking] about how it’s unfair that some students get extended time, or using language that’s inappropriate regarding ADHD.” She also said that the amount of students who get accommodations has doubled, and that may contribute to the acceptance shown by the student body. Within the faculty, those that do not have as much knowledge on ADHD or other learning differences will seek out Ms. Paine to discuss how to help different students.

When asking her about issues facing women and girls with ADHD, Ms. Paine explained that girls are less likely to be diagnosed because of the prevalence of inattentive-type ADHD in girls, their higher maturity levels as children, and girls internalizing hyperactive behaviors. She mentioned that many tend to explain away symptoms of ADHD in girls, attributing their behaviors in the classroom to poor test-taking skills, lack of interest in school, or being excessively social, instead of regarding them as potential symptoms. In addition, she explained that girls learn to cope with their symptoms better than boys due to their faster development, and that the high expectations placed on girls causes them to mask characteristics of ADHD, leaving them more stressed and anxious.

IV. PROJECT DESCRIPTION

I believed that the FSHA community held an inaccurate view of ADHD, although levels of inaccuracy varied depending on different factors. I predicted for parents to have the lowest level of accuracy, and teachers, as well as those diagnosed with ADHD, to have the highest. I predicted that less academic sources of information, such as social media, would lead to less response accuracy. I expected that the FSHA community was least knowledgeable on symptoms

of ADHD. Based on prior research, I also anticipated that an educational component to my study could help reduce stigma and bias around the disorder. Inspired by the study "Do Parents of Children with ADHD Know the Disease? Results from a Cross-Sectional Survey," I decided to create a survey quiz to determine the FSHA community's level of knowledge on ADHD, and provide explanations for each answer as an educational resource.

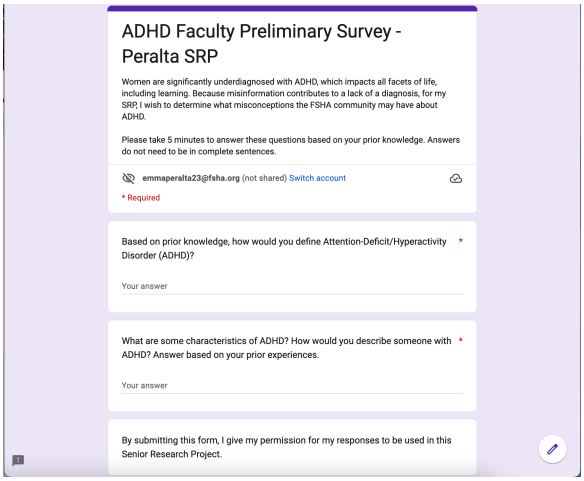
V. METHODS AND TOOLS

Because I based my project on the Fan, et. al. study, I needed to adapt the quiz portion of the study to match the scope of my project. I decided to modify the questions from the survey. Not only were the statements specific to their Chinese population sample, but I aimed to include students and teachers in my population sample in addition to parents. I needed to include statements specific to their level of knowledge and misconceptions about ADHD. In order to collect that information, I decided to make preliminary surveys targeting students and teachers to ask about what they knew about ADHD. The surveys were anonymous, to generate more accurate, honest responses, and contained a disclaimer stating that responses would be used in the project. Both surveys consisted of two questions to be answered in the respondent's own words:

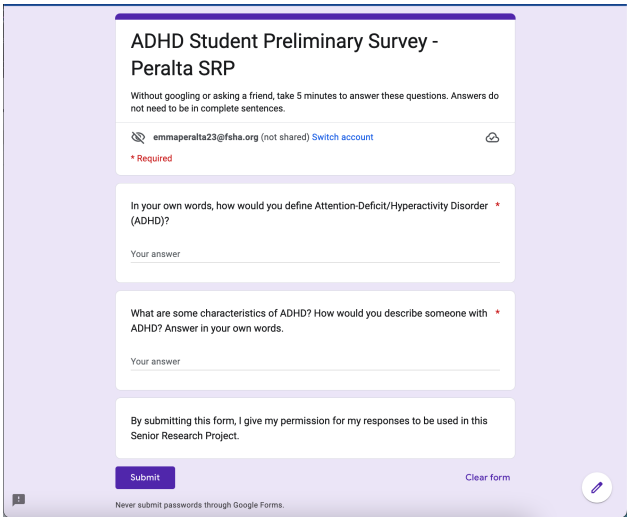
- How would you define ADHD?
- What are some characteristics of ADHD? How would you describe someone with ADHD?

I sent surveys to the faculty and freshman class; these surveys received 11 and 74 responses, respectively. The faculty responses to the first question were fairly accurate, with some giving a proper scientific definition for ADHD, but most responses were more vague or used simplistic terminology. Responses to the questions about characteristics of ADHD focused

more on externalized behaviors, such as fidgeting, outward restlessness, and interrupting in conversations. Inattentiveness was mentioned in the form of disorganization and distractibility, such as being annoyed by auditory stimuli like fans running, but not in the form of daydreaming or more internalized symptoms. This aligned with research saying that observers tended to overlook symptoms more common to inattentive subtype ADHD.



Student responses to the first question were extremely general. Students typically described ADHD as extreme restlessness or hyperactivity, and a complete inability to focus. There were few accurate scientific definitions for ADHD, with some incorrectly classifying it as a learning disability. Student responses to the question asking about characteristics of ADHD mentioned behaviors such as fidgeting, distractibility, having short attention spans, being energetic, and extroversion. Many responses also mentioned people with ADHD struggling academically. Most of the responses described externalized behaviors typical to hyperactive-subtype ADHD. Many responses had a more rudimentary or general view of symptoms, which led to some inaccuracies. Student responses did not demonstrate a significant depth of knowledge on ADHD.



With the results of these surveys, I was able to establish a baseline level of knowledge for both groups and determine questions for the quiz portion of the survey. Using Google forms, I created a multi-section quiz-style survey, with an educational component in the output of results after completing the quiz. The first section included a brief description, the estimated time of completion, and a disclaimer of anonymity. The second survey section included questions regarding demographics, such as participant gender, race and ethnicity, and primary language, and whether the participant was a parent, student, or faculty member.

Due to the true-false nature of the quiz, there was a possibility of participants with English as a second language misunderstanding the questions and responding incorrectly. This was observed through some student responses in the preliminary survey. If language barriers occurred, and participants received low scores or unusual incorrect responses, then it could be a reflection of not having English as a primary language rather than their knowledge of ADHD. I incorporated a question to distinguish between parents, students, and teachers, due to their varying levels of knowledge. If the respondent selected the student option, they would go to the third section, which included a question about graduation year for a similar reason as the question before.

The fourth section asked whether or not the participant had been diagnosed with ADHD, or had a close family member or friend with ADHD, as well as their relation to the participant. I

hypothesized that those diagnosed with ADHD would have greater knowledge and a more accurate view of the disorder, due to it being their lived experience. I also anticipated that those with close relationships to people with ADHD would have a more accurate perception of the disorder for a similar reason.

The fifth section focused on participant background knowledge of the disorder. I asked participants to rank how much they know about ADHD (on a 1-5 scale, 5 knowing the most), and well as where participants first learned about the disorder (checkbox list, 7 possible options). I also included a question about where participants have learned the most information about ADHD (checkbox list, 7 possible media options). If high-scoring participants all gained the most knowledge about ADHD from a certain place (ex. social media), then that could be used as a future educational resource. The opposite would be true if low-scoring participants all listed the same place. Comparing how much participants believe they know about ADHD to their actual score would also serve as a good marker of the FSHA community’s perceived level of knowledge on ADHD. As I believed social media would be a common source of information, I included questions asking how frequently participants see ADHD-related content on specific platforms, and the reliability of information from each platform.

I then created a 19-question true-false quiz to identify participant knowledge of ADHD. Questions covered themes of symptom presentation, causes of ADHD, and common myths about ADHD, with questions such as “ADHD is only found in boys.” These questions were created using results from the two preliminary surveys, and targeted some of the “blind spots” in participant knowledge (see appendix). I also wrote explanations for the answers to each question, incorporating research on women with ADHD and creating an educational component to my survey. These explanations included links to their sources, all of which were accurate and

medically-based (see appendix) Participants would receive the educational component after completion of the survey, at which point the form would reveal the participant's score, answers chosen, and the question explanations. Using this method, I hoped to discover the levels of knowledge held by the FSHA community.

VI. RESULTS

The survey ultimately received 172 responses from students (n=144) and teachers (n=28). Of the students, freshmen comprised the most responses (32.6%), followed by juniors (27.1%), sophomores (23.6%), and seniors (16.7%). Nearly 92% of respondents identified as female, and only 12.8% of respondents reported not having English as a first language. Of the 172 respondents, the average quiz response score was 15.52/19 points, with a median score of 16 from a range of 10-19 points. Only 7 respondents answered all 19 questions correctly. The most frequently missed questions (8 & 10) discussed symptoms of ADHD, with 37.8% and 41.3% correct responses, respectively (see appendix). These results align with the responses received in the preliminary surveys, as well as my initial predictions. Only question 11 had no incorrect responses.

Although I anticipated that teachers would have the highest level of accuracy, they earned a lower average response score than students (15/19 and 16/19, respectively). People diagnosed with ADHD also had the same average score as the majority of the population (16/19). Additionally, those who had close friends or family members with ADHD also did not have a higher average score than the rest of the population. Most participants stated that they first learned about ADHD through friends and family, but participants reported that they learned the most information about ADHD through social media. Of the participants that selected social

media as the manner they have received the most information on ADHD, content related to ADHD was seen most frequently on TikTok and Instagram rather than on any other platform.

After survey results were collected, I began receiving informal positive feedback from participants on the educational component of the survey. Participants frequently commented that they found the information interesting, surprising, and informative, with some even expressing that they had clicked on the linked sources and read more information. Many participants especially took interest in the information related to women with ADHD. These responses demonstrate the participants's willingness to learn new information, and indicate a possible bias reduction for the FSHA community in the future.

While the FSHA community has a good understanding of the causes of ADHD, and can identify and disprove some common misconceptions, there appears to be a gap in knowledge surrounding the manifestation of ADHD symptoms. Additionally, the FSHA community did not have much knowledge about the effect of ADHD on mental health and its association with other disorders. Positive reactions to learning new information about ADHD suggests that accurate educational materials can reduce these knowledge gaps.

VII. DISCUSSION

I experienced some confounding variables throughout the course of this project. Although I designed the survey to include parents as part of the sample population, I was unable to send it to the parents of each class. Because many of the survey questions were aimed towards parents, not having them in the population sample may have impacted my results, and results from the survey may not be entirely representative of a large portion of the FSHA population. After receiving survey responses, I had also intended to conduct a follow-up survey asking participants if they felt like they learned anything from the information in the answers at the end of the

survey. I was unable to conduct this survey due to time constraints and the scope of my project. However, I received sufficient informal results to conclude that the survey's educational component held some level of effectiveness.

I view the results of this study as the foundation for future research projects and/or schoolwide practices. One possible research project would be to aim a similar survey towards the parents of FSHA students and comparing those results with the results of this study, and the study done by Fan, et. al. in China. Though I modeled my survey on that study, I was unable to truly compare the two due to having no parent responses. Another possible research project would be to interview FSHA students with ADHD about how the disorder has affected their FSHA experience. Although this study may have identified some areas of misinformation and bias, those most aware about actual instances of bias against ADHD will be students with the disorder. Interviewing students with ADHD can shed light onto any manifestations of bias in the community, and can identify specific areas of improvement for the FSHA community. I also suggest applying this quiz-style survey as a classroom educational tool for ADHD and other conditions such as anxiety and depression.

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X. APPENDICES

Preliminary Faculty Survey

Preliminary Student Survey

"Look, a squirrel" - Final Survey

"Look, a squirrel" - Answer Key