Original Article

Self-Reported Attention Deficit Hyperactivity Disorder Among Students and Factors Affecting It

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Abstract

Objective: To evaluated the prevalence of attention deficit hyperactivity disorder in medical students and its associated factors.

Material and Methods: This was a cross-sectional study, conducted in the Department of Community Medicine of Aziz Fatimah medical and dental college Faisalabad. The study lasted for six months from July 2023 to December 2023. The total sample size was 300. Non-probability quota sampling was done. Almost 60 students were taken from every class from 1st year MBBS to 5th year MBBS. Ethical approval was taken beforehand. The questionnaire consisted three parts: sociodemographic data, adult attention deficit hyperactivity disorder self-reported scale and questions about participants physical activity, sleep patterns and total screen time. The online questionnaire was distributed to each class of MBBS through social media platforms. Data was the analyzed on SPSS 25. For categorical data, frequency and percentages were calculated. For comparing categorical data, chi-square was employed. A significance level of p < 0.05 was used.

Results: About one-third participants (n = 90, 30%) showed symptoms consistent with attention deficit hyperactivity disorder and more than one-third (n = 125, 41.6%) have excessive sleepiness. Significant relationship was seen between attention deficit hyperactivity disorder with sleep scale and total screen time.

Conclusion: Medical students have a relatively high prevalence of self-reported attention deficit hyperactivity disorder symptoms. Self-reported symptoms of attention deficit hyperactivity disorder are significantly correlated with sleep disorders and extended screen use. Therefore, modifying sleep patterns and reducing screen time may aid in the prevention and treatment of attention deficit hyperactivity disorder symptoms.

Keywords: Attention, Self, Students

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Introduction

Attention Deficit Hyperactivity Disorder is a neurodevelopmental disorder that has received considerable attention towards its influences on

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cognitive functions, behavior and overall life functioning.¹ The traditional links of attention deficit hyperactivity disorder with childhood have started receiving recognition as the condition prevalent in adolescence and adulthood as well. Although attention deficit hyperactivity disorder is diverse and a multifaceted set of behaviors, its relevance within the specific populations like medical students starts to rise concern as well as interest.² The rigorous nature that characterizes how one is trained in a medical school attracts great pressure on them and requires sustained attention, focus, and organization. Future healthcare providers, in the form of medical students, have an important role in society and any challenges they may confront during their learning period may have reverberations with respect to what they are going to do later in professional life.³ This research is out to delve more into the existence of attention deficit hyperactivity disorder symptoms among medical students giving insights into prevalence as well as factors associated.

Understanding regarding prevalence of attention deficit hyperactivity disorder symptoms in medical students is fundamental for the purpose of recognizing their range. The existing literature with regard to attention deficit hyperactivity disorder is in the children, yet there has been limited research that has specifically focused on the medical students. A demanding nature of hours of intensive study, rigorous coursework, and the pressure of achieving excellency may unmask or exacerbate symptoms of individuals that might not have been identified as being associated with attention deficit hyperactivity disorder⁴. Therefore, or more aptly it is pertinent to establish in depth the assessment of attention deficit hyperactivity disorder symptomatology in this unique population in order to avail further insights into peculiarities from adversity for medical students. A number of factors may be accounted for symptoms that are associated with attention deficit hyperactivity disorder among medical students. The development and onset of attention deficit hyperactivity disorder symptoms may signal an intricate interaction of genetic, environmental as well as psychological factors.⁵ The high academic pressures, competitiveness of the medical education, and stress associated with clinical rotations may act as the triggers or enhancing factors for persons having vulnerability to attention deficit hyperactivity disorder. Further, the special demands of medical education such as needing to maintain concentration at a time for quite long lectures, requirement to memorize complicated information by rote, and cumbersome nature of clinical work could have a role in manifesting symptoms of attention deficit hyperactivity disorder in medical students.6

The concern that is prime is posed by the impact that attention deficit hyperactivity disorder symptoms may have over academic performance, especially with regard to the medical education of a student. Inadequate treatment or lack of knowledge over the condition in medical students may pose them as being not able to stay organized, manage time, and maintain attention needed for lectures and study.⁷ Such challenges may eventually lead to poor academic performance that will ultimately interfere with proper completion of medical training. The determination of the effect caused by attention deficit hyperactivity disorder symptoms on learning for proper interventions and support systems is a necessity towards the provision of targeted interventions for such students.⁸

The clinical implications of this observation are not merely academic but also involved in the psychosocial sequelae of attention deficit hyperactivity disorder symptoms among medical students. The anxious trait and reduced self-esteem related to attention deficit hyperactivity disorder in students are further likely to be aggravated along with other comorbid psychopathology by the chronic and demanding need for medical education. Further, the stigma attached to mental issues may be bolstered in academic and professional social settings. ' The purpose of this study is to comprehensively explore broad spectrum prevalence of attention deficit hyperactivity disorder symptoms in medical students and factors that are associated with causing the presentation of those symptoms.

This research seeks to comprehensively investigate the prevalence of attention deficit hyperactivity disorder symptoms in medical students and help in identifying the associated factors contributing to the manifestation of these symptoms. Through this exploration, we aim to contribute to the existing body of knowledge surrounding attention deficit hyperactivity disorder in medical students.

Material and Methods

This was a cross-sectional study, conducted in the department of Community Medicine of Aziz Fatimah medical and dental college Faisalabad. The study lasted for six months from July 2023 to December 2023. This study was approved by the Institutional Review Board (IRB) with reference number

IEC/234-23 dated 14-06-2023. Based on practicality and the requirement to guarantee sufficient representation of students from various MBBS years and genders, a sample size of 300 was chosen. This number was deemed adequate for significant subgroup analysis within the study parameters, considering the total student population and study duration. Non-probability quota sampling was done. Quota sampling was chosen for the purpose of ensuring proportional representation of students across the years of MBBS as well as genders. Almost 60 students were taken from every class from 1st year MBBS to 5th year MBBS. Among 60 students, 30 were males and 30 were females. First 30 males and 30 females were taken from whole class who completed the questionnaire first and remaining were not considered. Students who provided consent and completed the questionnaire met the inclusion criteria; non-medical students and those who did not give consent were excluded. Based on a framework from earlier research on the prevalence of attention deficit hyperactivity disorder among medical students and related factors, a validated and structured questionnaire was employed. This questionnaire consisted of three parts: sociodemographic data, adult attention deficit hyperactivity disorder self-reported scale and third part contained questions about participants physical activity, sleep patterns and total screen time which were taken as associated factors. Adult attention deficit hyperactivity disorder scale has two parts. Participants were asked to fill out Parts A and B of the Symptom Checklist of attention deficit hyperactivity disorder by checking the option next to the response that most accurately indicates how frequently each symptom occurs. In terms of grading, if four or more marks appear in the darkly tinted Part A boxes, it means that the patient's symptoms are extremely close to those of adult attention deficit hyperactivity disorder and that more study is required. Part B's frequency ratings offer more hints and can be used as extra tools to delve deeper into the student's symptoms. 10 The Epworth Sleepiness Scale is a widely used subjective measure in sleep medicine of a patient's general level of sleepiness. The scale is an itemized set of eight specific scenarios where the

subjects indicate on a scale of 0, no chance of dozing, to 3, high chance of dozing. A sum of the responses then leads to a final score that is framed on a 0-24 score scale. It provides an estimate of whether a person may be suffering excessive sleepiness potentially requiring medical advice. 11 Physical activity was assessed by asking participants about it from doing it zero times to more than 5 times per week and screen time was assessed by including screen time status including laptop, television, cellphone daily from zero to more than six hours daily. The online questionnaire was distributed to each class of MBBS through social media platforms. Data then imported to excel sheet and subsequently to SPSS 25 on which statistical analysis was conducted. Descriptive statistics were summarized as mean \pm standard deviation (SD) for continuous variables, while frequencies and percentages were used to represent categorical variables. The chi-square test was subjected to comparative analysis of categorical variables, as it was appropriate in determining associations between independent categorical data such as gender, ADHD symptom prevalence, and sleep disturbances. A significance threshold of p <0.05 was used.

Results

Total participants included in the study were 300. Among them, 150 (50%) were males and 150 (50%) were females. Equal number of participants were included from each MBBS class i.e. 60 (20%). Mostly participants were above 21 years of age i.e. 158 (52.7%), also 186 (62%) were day scholars while majority of the participants i.e. 248 (82.7%) were having urban residence.

Self-reported attention deficit hyperactivity disorder symptoms were seen in about one-third (30%) of participants. Epworth sleepiness scale was used to assess sleeping patterns of participants. More than $1/3^{rd}$ of participants had excessive sleepiness (n = 125, 41.6%) including about one-tenth (n = 34, 11.3%) of participants who needed medical attention. Physical activity was assessed by doing at least 30 minutes' walk from zero times to more than five times in a

week and mostly participants done it once a week (n =91, 30.3%). Screen time status was assessed by evaluating daily total screen time including laptop, television, cellphone of participants and majority of them (n = 129, 43%) had screen time of 4-5 hours as shown in table 1. Demographic properties of participants with attention deficit hyperactivity disorder symptoms prevalence were assessed. attention deficit hyperactivity disorder symptoms were more prevalent among females, day scholars, participants living in urban areas and in 3rd year MBBS students, closely followed by 4th year and 2nd year MBBS students. None of the demographic variables showed significant associations as shown in Table 2. Significant associations were seen between attention deficit hyperactivity disorder with sleep and total screen time but not with physical exercise as shown in table 3.

Table 1: Participants status of sleep pattern, physical activity & screen time

	Frequency		Percent	
		(n = 300)	rereent	
	Unlikely			
	abnormally	131	43.7	
	sleepy			
C1 .	Daytime	44	14.7	
Sleeping	sleepiness			
patterns of	Excessively	91	30.3	
participants	sleepy			
	Excessively			
	sleepy, need	34	11.3	
	medical	0.	1110	
Physical activity status Screen time status	attention			
	Zero	85	28.3	
	Once	91	30.3	
	2-3 times	75	25	
	4 times	18	6	
	5 times or more	31	10.3	
	1-2 hours	46	15.3	
	3-4 hours	56	18.7	
	4-5 hours	129	43	
	> 5 hours	69	23	

Table 2: Association between demographic variables

 and attention deficit hyperactivity disorder

	Attention deficit			
Demographic	hyperactivity disorder		p value	
variables		symptomatic		
		Yes	No	
Gender	Male	42 (14%)	108 (36%)	0.45
	Female	48 (16%)	102 (34%)	0.45
Boarding	Day scholar	58 (19.2%)	128 (42.7%)	0.57
status	Hostelite	32 (10.7%)	82 (27.3%)	
Permanent	Urban	71 (23.7%)	177 (59%)	0.26
residence	Rural	19 (6.3%)	33 (11%)	
	1 st Year	16 (5.3%)	44 (14.7%)	
Class	2 nd Year	20 (6.7%)	40 (13.3%)	0.16
	3 rd Year	22 (7.3%)	38 (12.7%)	0.10
	4 th Year	21 (7%)	39 (13%)	
	5 th Year	11 (3.7%)	49 (16.3%)	

Table 3: Associations between attention deficit

 hyperactivity disorder with sleep, physical activity and

 total screen time

		Disorder symptoms		p-alue
		Yes	No	
Sleep scale	Unlikely abnormally sleepy	32	99	
	Daytime sleepiness	8	36	0.000*
	Excessively sleepy	34	57	0.008*
	Excessively sleepy and need medical attention	16	18	
Physical	0	30	55	0.66
activity	Once	28	63	
status	2-3 times	20	55	
(frequency in a week)	4 times	5	13	
	5 times or more	7	24	
Screen time status including laptop, television,	0-2 hours	3	43	0.00*
	3-4 hours	9	47	
	5-6 hours	36	87	
	More than 6 hours	42	33	

Discussion

The objectives of the study were to study the overall frequency of attention deficit hyperactivity disorder in medical students and different factors related to it which may have an association with it. As this

Esculapio - Volume 21, Issue 01, January - March 2025 - www.esculapio.pk - 130

disorder has been studied to a lesser extent especially in medical students therefore our study will try to fill the gap in this domain. The frequency of attention deficit hyperactivity disorder in our study came out to be 30% which is on higher side. A research done by Nader Alrahili et al showed that prevalence of attention deficit hyperactivity disorder among medical students in Riyadh city was 10.9% which is one-third as compared to our study where noted prevalence was 30%.¹² A research done by Karl Fai Njuwa et al showed prevalence of 24.4% among medical students in Cameroon which is also on lower side as compared to our study.¹³ A research done by Mohammad-RezaMohammadi et al showed prevalence of 4% among participants which was way less than what was observed in our participants.¹⁴ A systemic review done by Mitra Hakim Shooshtari et al showed prevalence range of attention deficit hyperactivity disorder among adults from 3.9% to 25.1% which was also lower than our study.¹⁵ A research done by Takafumi Watanabe et al showed prevalence of 20.5% of attention deficit hyperactivity disorder among medical students.¹⁶ A research done by Waleed Ahmed Alghamdi et al also showed lower prevalence of attention deficit hyperactivity disorder among medical students i.e. 11.9% as compared to our study¹⁷. There are a number of reasons for this variation in prevalence. The reported rates might have been affected by variations in screening methods, diagnostic criteria, and study environments. Differences in students' stress levels and coping strategies, as well as cultural and educational backgrounds, might also be factors. The higher prevalence in our study might also be a result of students' growing self-awareness and propensity to self-report, especially in demanding academic settings. Furthermore, a higher reported prevalence of ADHD may result from factors like high expectations, long study hours, and the competitive nature of medical school that exacerbate symptoms. These discrepancies might be clarified by future research using standardized methodologies in various geographical areas. A research done by Mohammad-Reza Mohammadi et al showed that attention deficit

hyperactivity disorder was 4% and more common in males and in urban residents.¹⁸ In terms of residence, results were similar but in comparison to our study, this disorder was more prevalent in females and also overall prevalence was 30%. A research done by Himani Mahesh Joshi et al also showed more prevalence of attention deficit hyperactivity disorder symptoms in females.¹⁹ Which is similar to our study. A research done by Azam Hamidzadeh et al showed significant association between attention deficit hyperactivity disorder and living in rural areas.²⁰ which is in contrast to the result of our study where it was more prevalent in urban areas. This disparity may result from variations in access to healthcare, environmental stressors, and lifestyle. Students in urban settings are subjected to greater academic demands, more screen time, and more distractions, all of which can exacerbate symptoms of ADHD. Higher identification rates may also result from increased awareness and easier access to diagnostic services in urban areas. A research done by Birgit Levelink et al showed that screen time and sleep was not associated with attention deficit hyperactivity disorder.²¹ but in our study, we found significant association between them. A research done by Yeqing Zhang et al also showed significant association like our study between screen time and attention deficit hyperactivity disorder.²² A research done by Anyi Yang et al also showed significant association between screen time and attention deficit hyperactivity disorder like our study.²³ A research done by Christian Fadeuilhe et al showed positive association of sleep disorders with attention deficit hyperactivity disorder²⁴. which is similar to the result of our study. A research done by Tomoko Suzuki et al showed that attention deficit hyperactivity disorder was more prevalent among males which was not similar to our study but showed significant association like our study with sleep patterns.²⁵

To find people who were at greater risk to have ADHD, a validated screening tool was used instead of a formal psychiatric examination. This tool has been proven to be a trustworthy screening technique, even though no clinical evaluation was carried out. However, in order to reduce bias, efforts were made to collect data during a time of relative academic stability, avoiding peak exam seasons, in recognition of the possible impact of academic stress on selfreported symptoms. Students were also reassured that participation was anonymous and voluntary, which decreased the possibility of socially acceptable answers. In order to ensure confidentiality and address ethical and anonymity concerns, responses were gathered without the use of personal identifiers. Since the goal of the study was to determine prevalence rather than make a diagnosis, the researchers did not get in touch with students based on their screening results. Students who showed interest in their findings, however, were given general information about ADHD and directed to the institution's counseling and mental health resources. A systematic follow-up system could be included in future studies to assist students who might profit from additional evaluation and intervention. Additionally, no causal relationships could be established because the study was cross-sectional. A longitudinal or randomized controlled trial approach may be used to ascertain the long-term effects of ADHD symptoms on the academic performance and mental health of medical students in order to support future findings.

Conclusion

Medical students have a relatively high prevalence of self-reported attention deficit hyperactivity disorder symptoms, which may be interfering with their social and academic functioning. Self-reported symptoms of attention deficit hyperactivity disorder are significantly correlated with sleep disorders and extended screen use. Physical exercise and attention deficit hyperactivity disorder symptomology are not, however, substantially correlated. Therefore, modifying sleeping patterns and reducing screen time may aid in the prevention and treatment of attention deficit hyperactivity disorder symptoms. It is advised that further research be done to find out the true frequency of attention deficit hyperactivity disorder in both the general population and targeted groups.

Conflict of Interest	None
Funding Source	None

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Authors Contribution

MD: Conceptualization of Project

- AS, BM, MB: Data Collection
- MB, S: Literature Search
- MD: Statistical Analysis
- MB, S: Drafting, Revision
- AS, BM, MB: Writing of Manuscript