

# MENTAL HEALTH STATUS AND SOCIAL COMMUNICATION SKILLS AMONG ADULTS SUSPECTED WITH ATTENTION DEFICIT HYPERACTIVITY DISORDERS (ADHD) SYMPTOMS

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## ABSTRACT

**Introduction:** To date, limited epidemiological data are available concerning the impact of attention deficit hyperactivity disorders (ADHD) and mental health issues on the social communication skills of adults in Malaysia. It is crucial to comprehend the relationship between ADHD symptoms and how they may affect individuals' mental health status and social communication skills. **Objective:** The aims of the current study are to ascertain the prevalence of undergraduate students suspected of having ADHD, experiencing depression-anxiety-stress, and exhibiting poor social communication skills. Furthermore, this study seeks to compare the mental health status and social communication skills of adults with and without ADHD symptoms. Additionally, this study also aims to examine the relationships between mental health status, ADHD symptoms, and social communication skills among undergraduate students in higher education institutions. **Method:** A cross-sectional study design was utilized among undergraduate students at one of the universities in Pahang. The study subjects were recruited through snowball sampling and data collection was conducted over a period of approximately three months. A total of 186 participants completed self-reported demographic information, self-rating questionnaires, including the Depression Anxiety and Stress Scale 21 (DASS-21), Adult ADHD Self-Report Scale (ASRS v1.1) and Conversational Skills Rating Scale (CSRS), via an online questionnaire platform (Google Forms). **Results:** It was found that 39% of undergraduate students are suspected to have ADHD symptoms. A high prevalence of depression, anxiety, and stress, at 69.0%, 75.9% and 49.7%, respectively, was also observed. Significant differences ( $p < 0.05$ ) were found in depression-anxiety-stress and social communication skills between students with and without ADHD symptoms. There were low to moderate correlations, ranging from -0.08 to 0.61, between communication skills, mental health domains, and ADHD subdomains. **Conclusions:** ADHD symptoms, mental health status, and social communication skills between undergraduate students with and without ADHD symptoms were statistically different. There were significant associations between ADHD symptoms, depression, anxiety, and stress. However, only a weak association was revealed between ADHD symptoms and social communication skills among undergraduate students in Pahang.

**KEYWORDS:** ADHD, stress, anxiety, depression, social communication

## INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) in childhood is known to often persist into adulthood (Weiss & Hechtman, 1993). The pooled prevalence of adult ADHD has increased from 5.29% in 2007 to 6.76% in 2021 (Song et al., 2021; Polanczyk et al., 2007). The rising percentage in the prevalence of adult ADHD may indicate the seriousness of this condition. According to Kooij et al. (2010), many adults with ADHD are underdiagnosed and do not receive proper treatment for several reasons. Firstly, there may be a lack of information about the disorder. Next, it is common for adults with ADHD to cope with their symptoms by adjusting their behaviours. Lastly, comorbid psychiatric conditions may mask the ADHD symptoms (Kooij et al., 2010).

Generally, individuals with ADHD are more likely to experience other mental health problems (Mayo Clinic, 2019; Centers for Disease Control and Prevention, 2021). It is quite common for people with ADHD to also have anxiety, depression, conduct disorder, substance abuse, and sleeping problems (Harpin, 2005). Individuals with ADHD may exhibit issues such as difficulty in paying attention, hyperactivity, impulsive behaviour, or a combination of these three symptoms (American Psychiatric Association, 2013). However, the symptoms of ADHD in the adult population may not be as distinct as ADHD symptoms in children, which may explain cases of misdiagnosis and underdiagnosis of ADHD in adults (Ginsberg et al., 2014).

A study mentioned that the executive functions of the brain such as judgment, decision-making, initiative, memory, and the ability to complete complex tasks, are disrupted in individuals with ADHD (Wilens and Spencer, 2010). Therefore, ADHD in adults can lead to various problems, including low confidence and self-esteem, poor academic or work outcomes, and unstable relationships (Kim et al., 2016; Watters et al., 2017). Moreover, their social communication skills may be impaired, as they often find speech, social, and executive function skills challenging. The affected components of speech, social skills, and executive functions among adults with ADHD fall within the scope of practice of speech language pathologists (James (2017).

Furthermore, it was found that the quality of life in adults with ADHD is lower than that of those without ADHD (Pinho et al., 2017). For example, one study concluded that college students with ADHD behave similarly to other working adults with ADHD and have a lower quality of life than students without ADHD (Pinho et al., 2017). In another study, it was found that these students appeared to be more depressed and anxious, easily frustrated, and inclined to suppress their emotions. They also experience difficulty in achieving excellent academic performance and maintaining positive relationships with their friends (Kim et al., 2016). These negative impacts of ADHD may raise concerns regarding mental health problems among the students.

Several studies have examined the prevalence of ADHD, comorbid depression, stress, and anxiety, as well as their associations with ADHD amongst university students outside of Malaysia (Shen et al., 2020; Salla et al., 2019; Panevska et al., 2015). However, little epidemiological data are available concerning the influence of ADHD and comorbid mental health issues on social communication skills among adults in Malaysia. Therefore, the aims of this study are as follows: (1) to determine the prevalence of undergraduate students suspected with ADHD, depression-anxiety-stress, and poor social communication skills, (2) to identify differences in mental health status and social communication skills between adults with and without ADHD symptoms, and (3) to examine the association between mental health status, ADHD symptoms, and social communication skills among undergraduate students in Pahang.

## **METHODOLOGY**

### **Study Design**

This cross-sectional study protocol was approved by the International Islamic University Malaysia (IIUM) Research Ethics Committee (IREC 2022 - KAHS/DASLP/11). It was conducted at one of the higher education institutions in Pahang, using an online platform (i.e., Google forms). All participants have signed the informed consent form to enrol in the study.

### **Subjects**

The study subjects were undergraduate students who were taking any bachelor's degree in the selected institution.

The inclusion criteria for the subjects:

1. Undergraduate students from all years, faculties and courses who are willing to participate in the study.

The exclusion criteria for the subjects:

1. Undergraduate students who refuse and are not willing to participate due to personal reasons.
2. Undergraduate students who are involved in pre-testing and pilot study.

### **Sample Size Calculation**

To examine the mean difference between two independent groups utilizing a two-tailed test with a significance level ( $\alpha = 0.05$ ) and medium effect size ( $d = 0.50$ ), a priori power analysis was conducted using G\*Power3 (Faul et al., 2007). The analysis indicated that this study necessitated a sample of 128 participants, distributed equally into two groups ( $n = 64$  for each), to achieve a statistical power of 0.80. A total of 187 undergraduate students consented to participate in this research.

### **Instrumentation**

In this study, the researchers administered an online questionnaire using Google Forms to collect data from the participants. The questionnaire included sections for obtaining participants' informed consent form, gathering socio demographic information, and administering the following self-reported scales: the Depression, Anxiety and Stress Scale - 21 (DASS-21) Questionnaire (21 items) (Henry & Crawford, 2005), the Adult ADHD Self-report Scale (ASRS v1.1) Symptom Checklist Questionnaire (18 items) (Kessler et al., 2005) and Conversational Skills Rating Scale-Rating of Self Form (CSRS) Questionnaire (25 items) (Spitzberg & Adam, 2007).

In the case of the DASS-21, responses were recorded on a 4-point Likert scale, ranging from 0 ("did not apply to me at all") to 3 ("applied to me very much"). The ASRS v1.1 employed a 5-item Likert scale to gauge the frequency of symptoms occurrence, with responses ranging from 0 ("never") to 4 ("very often"). Lastly, the CSRS questionnaire utilized a 5-point continuum to assess competence, encompassing the following categories: inadequate, fair, adequate, good, and excellent. English as the language of choice for all sections of the questionnaire.

### **Reliability Measurement**

As the DASS-21 questionnaire is widely employed within the adult population in Malaysia, this study did not assess its. Nevertheless, previous research has reported that the DASS-21 demonstrates internal consistency and concurrent validity within acceptable to excellent ranges for both its overall and its

subscales, aligning with findings from the original version of the DASS-42 questionnaire. Specifically, reported Cronbach's alpha value for the overall scale was 0.93, while for the depression, anxiety, and stress subscales, they were 0.91, 0.85, and 0.86, respectively (Noorlila et al., 2018; Antony et al., 1998).

In this study, as the ASRS v1.1 and CSRS are not yet widely utilised within the Malaysian population, we conducted an analysis to examine their internal reliability. This analysis involved calculating the Cronbach's Alpha ( $\alpha$ ) coefficient for the overall items in both questionnaires. This analysis yielded an excellent Cronbach's Alpha ( $\alpha$ ) value of 0.906 for the 18 items in ASRS v1.1 questionnaire. Furthermore, acceptable  $\alpha$  values were observed for its individual domains, specifically inattention (9 items) with a value of 0.85, motor hyperactivity-impulsivity (5 items) at 0.77, and verbal hyperactivity-impulsivity (4 items) with a value of 0.76. In addition, Cronbach's alpha ( $\alpha$ ) value for the 25 items in the CSRS questionnaire was also excellent at 0.908. These results affirm the excellent reliability of both questionnaires, supporting their suitability for use in this study.

### **Validity Measurement**

Face validity testing for both ASRS v1.1 and CSRS questionnaires was conducted during the pre-testing phase. In this process, a group of undergraduate students from various universities in Malaysia (n=10) were engaged. Evaluation was based on four key domains, namely readability (comprehensibility), feasibility (suitability), clarity of language, and layout and style, with scoring determined by 'Yes' (1 point) and 'No' (0 points) (Venkitachalam, 2015). Participants were tasked with scoring the items in both questionnaires across these domains, with a criterion proposed by Jusoh (2020) that items scoring 90% or above were considered acceptable.

For ASRS v1.1 questionnaire, this study revealed that all four pre-testing domains achieved acceptability, with a perfect score of 100% in readability, feasibility, clarity of words and layout and style. Meanwhile, in the case of the CSRS questionnaire, the pre-testing scores were also deemed acceptable, with a 100% score for feasibility, and layout and style. The scores for comprehensibility and clarity of language were 98.80% and 97.60%, respectively. As reported by the participants, the time required to complete both the ASRS v1.1 and CSRS questionnaires averaged five minutes, a duration considered not unduly protracted. All participants confirmed that all items were clear and easily understood. Consequently, no further revision to the items were deemed necessary.

### **Statistical Analysis**

Descriptive analysis of the data was done by computing SPSS version 12.0. To assess the normal distribution of continuous data, the Skewness and Kurtosis test was employed. The results indicated that all continuous data conformed to a normal distribution, as evidenced by Z values falling the range of -3.00 to 3.00. Consequently, parametric tests were applied for data analysis. An independent sample 'T' test was utilized to discern differences in mental health status and social communication skills between adults with and without ADHD symptoms. The relationships between variables were measured using Pearson correlation coefficients. All statistical analyses were performed using SPSS (Version 12.0; IBM, Inc., Chicago, Illinois), with a significance level set at 0.05 (two-tailed).

## **RESULTS**

In this study, a total of 187 responses were obtained during the research period. Demographic characteristics of the participants are presented in Table 1. Of the 187 participants, 82.4% were female, with the majority falling within the 21 to 25 years age range (90.4%). Students from all years of study were invited to participate in the research; however, Year 4 students constituted the largest percentage of participants (46.1%). Regarding Cumulative Grade point average (CGPA), 66.3% of the students achieved

a CGPA between 3.50 and 4.00. Approximately 46.0% of the students reported a family income exceeding RM5000. The majority of the participants also disclosed no family history of mental illnesses (92.0%), current non-smoking status (97.9%), non-use of drugs (98.4%), and abstinence from alcohol (100%). During the data collection period, a small proportion of participants (18.2%) reported having utilised counselling services offered by their institution.

**Table 1:** Demographic Characteristics of the Participants (N=187)

<b>Variable</b>	<b>Percentage (%)</b>	<b>Frequency (n)</b>
<b>Gender</b>		
Male	17.6	33
Female	82.4	154
<b>Age</b>		
15-20	7.5	14
21-25	90.4	169
25-30	1.6	3
>30	0.5	1
<b>Year of Study</b>		
Year 1	8.6	16
Year 2	14.4	27
Year 3	26.2	49
Year 4	47.1	88
Year 5	3.7	7
<b>CGPA</b>		
3.50-4.00	66.3	124
2.00-3.49	33.2	62
<2.00	0.5	1
<b>Family income</b>		
>RM5000	46.0	86
RM2501-RM5000	27.8	52
RM1500-RM2500	10.2	19
<RM1500	16.0	30
<b>Family history of mental disorder</b>		
Yes	8.0	15
No	92.0	172
<b>Smoking status</b>		
Yes	2.1	4
No	97.9	183
<b>Drugs usage</b>		
Yes	1.6	3
No	98.4	184
<b>Alcohol usage</b>		
Yes	0	0
No	100	187

**Utilised counselling services offered by the institution**

Yes	18.2	34
No	81.8	153

This study aimed to determine the prevalence of adults suspected of having ADHD, depression, anxiety, stress, and poor social communication skills among undergraduate students in Pahang. The investigation revealed that 39% of the participants (73 out of 187) were suspected of having ADHD. Among the 73 subjects suspected of having ADHD, 9 were male, and 33 were female. The frequencies of depression, anxiety and stress among university students were 69.0%, 75.9% and 49.7%, respectively. In terms of communication skills, 7 out of 187 participants (3.74%) scored as having poor communication skills, while the remaining respondents scored in the range of good to excellent.

The mean scores for depression, anxiety, and stress in this study were 7.27, 7.16 and 8.21, respectively. The study's findings indicate the prevalence of depression in the following categories: normal (31%), mild (17.1%), moderate (25.7%), severe (12.8%), and extremely severe (13.4%). The prevalence of anxiety was distributed as normal (24.1%), mild (16%), moderate (17.1%), severe (12.8%), and extremely severe (30%). Meanwhile, the prevalence of stress was observed within the range of normal (50.3%), mild (15%), moderate (13.3%), severe (15.5%), and extremely severe (5.9%). Detailed information on the levels of depression, anxiety, and stress can be found in Table 2.

**Table 2: Levels of Depression, Anxiety and Stress among The Participants**

Variable	Levels	Percentage (%)	Frequency (n)
Depression	Normal	31.0	58
	Mild	17.1	32
	Moderate	25.7	48
	Severe	12.8	24
	Extremely Severe	13.4	25
Anxiety	Normal	24.1	45
	Mild	16.0	30
	Moderate	17.1	32
	Severe	12.8	24
	Extremely Severe	30.0	56
Stress	Normal	50.3	94
	Mild	15.0	28
	Moderate	13.3	25
	Severe	15.5	29
	Extremely Severe	5.9	11

The independent 'T' test statistical analysis was carried out to compare the mental health status and social communication skills in adults with and without ADHD. The statistical analysis revealed significant two-tailed results with p-value less than 0.05 (p=0.000 - 0.01) for all variables, and a 95%

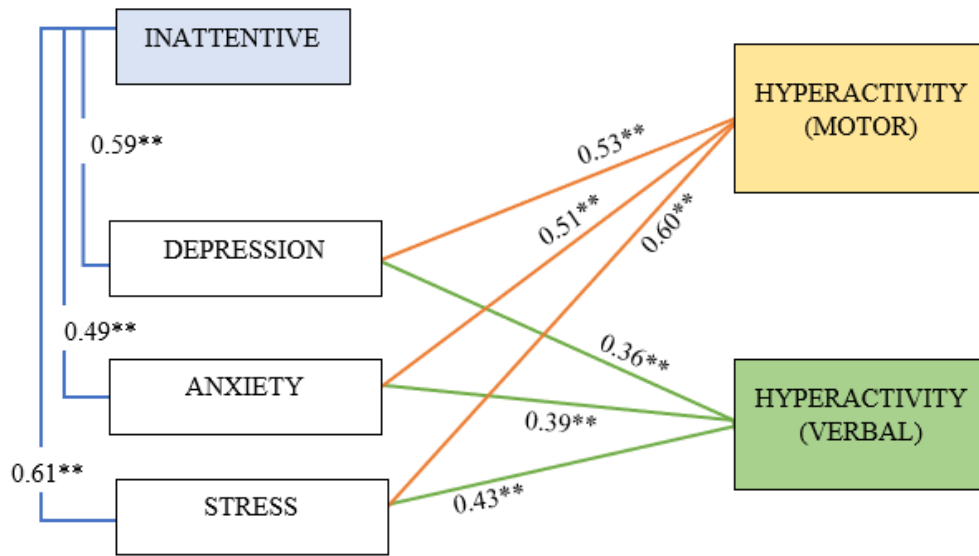
confidence interval was applied. Therefore, we can infer that significant differences exist in depression-anxiety-stress, and social communication skills between adults with and without ADHD symptoms.

**Table 3:** Independent 'T' Test of Differences of Mental Health Status and Social Communication Skills among Students with and without ADHD

Domain	Mean Difference	Std. Error Difference	Degree of Freedom (df)	Sig. (2-tailed)
Total depression score	-4.662	0.654	185	0.000
Total anxiety score	-3.287	0.642	185	0.000
Total stress score	-4.503	0.630	185	0.000
Total communication score	6.378	1.966	185	0.001

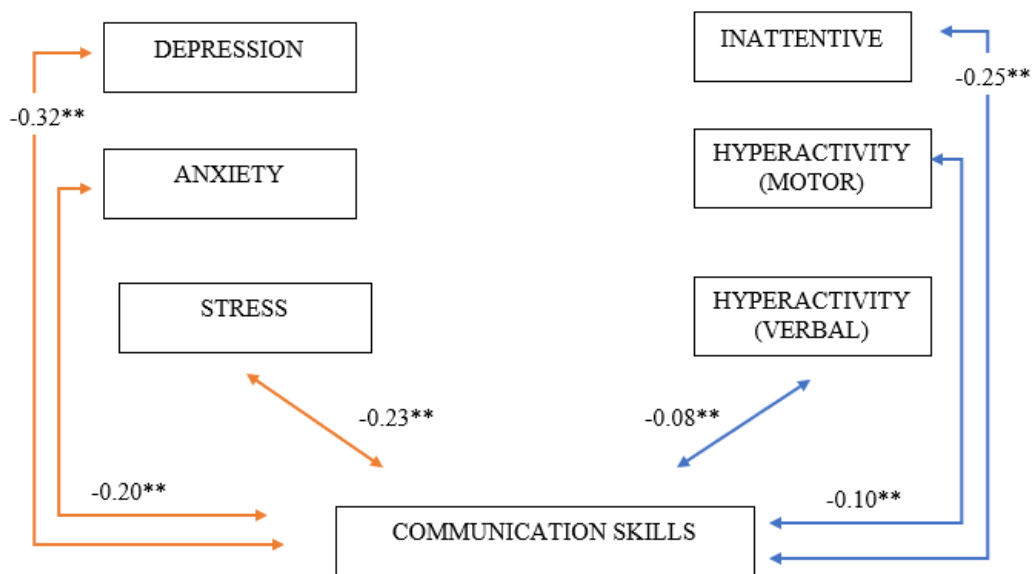
Given the normal distribution of data for the variables, Pearson product-moment correlation coefficient analysis was employed to measure the relationships between mental health status, ADHD symptoms, and social communication skills. The correlation coefficients ( $r$ ) values were interpreted according to the established guidelines for correlation coefficient ranges (Ratner, 2009 as cited in Sharif, 2019).

Figure 1 presents the correlation coefficients ( $r$ ) between ADHD subdomains and mental health status, with  $r$ -values falling within the range of low to moderate, specifically ranging from 0.36 to 0.61. Moreover, Figure 2 illustrates the correlation coefficients ( $r$ ) between communication skills and mental health domains, as well as communication skills and ADHD subdomains, with  $r$ -values spanning from -0.08 to -0.32, with most values suggesting a weak negative correlation. All the correlation coefficients were significant at the 0.01 confidence level (two-tailed). In summary, these results affirm that a significant association between the ADHD sub-domains and mental health domains.



NOTE: \*\*Correlation is significant at the 0.01 level (2-tailed)

Figure 1: Correlation Coefficients between ADHD Sub-domains and Mental Health Domains



NOTE: \*\*Correlation is significant at the 0.01 level (2-tailed)

Figure 2: Correlation Coefficients between ADHD Sub-domains, Mental Health, and Communication Skills



## DISCUSSION

In this study, the prevalence of undergraduate students suspected of having ADHD is 73 out of 187 students, accounting for 39.0% of the sample. A prior study found that approximately 15.9% of university students exhibited ADHD symptoms (Roshani et al., 2020). Moreover, globally, 6.76% of adults are documented to experience ADHD symptoms, with the pooled prevalence of ADHD among adults showing an increase from 2006 to 2021 (Song et al., 2021; Polanczyk et al., 2007). However, the proportion of undergraduate students with symptomatic ADHD in this study surpasses the reported statistics, suggesting a higher prevalence. The upward trend may be attributed to the underdiagnosis of ADHD among adults. Individuals with ADHD symptoms might not recognise their condition as such and instead consider these symptoms as typical aspects of daily life. Factors contributing to the underdiagnosis of ADHD among adults may include a lack of information about the disorder, adults' adaptive coping mechanisms, and the presence of comorbid psychiatric (Kooij et al., 2010).

The prevalence of mildly to extremely severe depression, anxiety, and stress among undergraduate students was found to be 69%, 75.9% and 49.7%, respectively, suggesting relatively high levels of these mental health challenges among undergraduate students in Pahang. A comparable study conducted in Pakistan, which examined the mental health status of undergraduate students, reported that 75% of the students were experiencing depressive symptoms, 88.4% exhibited anxiety symptoms, and 84.4% reported experiencing stress (Asif et al., 2020). In Malaysia, undergraduate students have also been reported to experience varying degrees of depression and anxiety, largely attributed to the COVID-19 pandemic (Sundarasan et al., 2020; Woon et al., 2021). Several factors may contribute to the elevated levels of depression, anxiety, and stress among undergraduate students in Malaysia. For instance, prior research has suggested that higher levels of anxiety and stress among university students could be linked to disruption and delays in academic programs (Islam et al., 2020). With Malaysia experiencing multiple Movement Control Orders (MCO) since the onset of the COVID-19 pandemic, this may have intensified feelings of anxiety, depression, and stress among students. In light of these findings, it becomes essential for the university authorities to play a pivotal role in safeguarding the psychological and mental well-being of students through various means and platforms.

This study also observed significant differences in mental health status and social communication skills between adults with and without ADHD symptoms. This aligns with prior research indicating disparities in brain development, structure, and function between the two groups (ADHD and without ADHD) (American Academy of Child and Adolescent Psychiatry, 2017; Hoogman et al., 2017). The distinct characteristics of the ADHD brain can have substantial impacts on thinking, behaviour, and emotions. Consequently, adults with ADHD symptoms often encounter considerable challenges in their daily lives as these aspects are affected. In line with our hypothesis, a study revealed that the quality of life in adults with ADHD is lower compared to those without ADHD (Pinho et al., 2017). Besides, ADHD symptoms have implications for the psychosocial domain, potentially leading to diminished self-confidence and self-esteem among adults with ADHD symptoms (Watters et al., 2017). For instance, a study was conducted to examine the ability of adults, particularly undergraduate students with varying levels of ADHD symptoms, to take their conversational partner's perspective. The results implied that individuals with more severe ADHD symptoms exhibited decreased ability to consider their conversational partner's perspective when formulating responses. Furthermore, the study emphasized that successful communication necessitates significant cognitive and attention resources, including short term memory and the ability to resist the urge to respond inappropriately (Lin et al., 2010; Nilsen et al., 2013). Given that individuals with high self-reported ADHD symptoms encounter challenges with these skills, experts are keen on investigating how these issues may affect more intricate social interactions. Therefore, these findings contribute to the existing body of evidence illustrating distinctions between adults with and without ADHD symptoms.

Our study also identified a moderate positive correlation ( $0.3 < r < 0.7$ ) between ADHD symptoms, including inattentive, motor hyperactivity, verbal hyperactivity, and mental health status, encompassing

depression, anxiety, and stress. These findings align with previous studies that has consistently reported the common co-occurrence of ADHD in the adult population with various psychiatric disorders, including mood disorders, depressive and anxiety disorders, substance use disorders, and personality disorders (Ginsberg et al., 2014; Katzman et al., 2017). Moreover, high prevalence of comorbid psychiatric disorders has been observed in adults with ADHD (Pehlivanidis et al, 2020), underscoring the existence of overlapping symptoms between ADHD and other concurrent psychiatric conditions. Among the subdomains of ADHD, inattentiveness and motor hyperactivity exhibited particularly high r-values ( $r > 0.5$ ) in their association with depression, anxiety, and stress, signifying a significant and moderate level of correlation with these three mental health domains in our study. A similar study reported noteworthy associations between anxiety, depression, inattention, and hyperactivity (Shen et al., 2020). These findings are valuable for informing clinical diagnosis and treatments approaches to the patients. Providing clinical diagnosis and tailored treatment programs tailored to individual patients can be challenging. Katzman et al. (2017) have noted that the Canadian ADHD Resource Alliance (CADDRA) guidelines recommend that when ADHD coexists with other psychiatric disorders in adults, the primary treatment should target the most impairing condition. Thus, the early identification and treatment of ADHD and its comorbidities can potentially alter the trajectory of the psychiatric morbidity later in life.

Furthermore, this study reveals a weak negative correlation ( $-0.3 < r < 0$ ) between ADHD symptoms, encompassing inattentiveness, motor hyperactivity, and verbal hyperactivity, and social communication skills. These results contrast with the assertions made in previous studies that have linked ADHD to both speech and language issues as well as mental health and behavioural challenges (Cantwell, Baker, & Mattison, 1979, 1981; Chess & Rosenberg, 1974; Love & Thompson, 1988; Trautman, Giddan, & Jurs, 1990 as cited in Damico et al., 2010). Nonetheless, upon closer examination of the data, it is noteworthy that 5 out of 7 students (71.4%) who scored poorly in communication skills are suspected of having ADHD. This suggests a potential vulnerability for individuals experiencing ADHD symptoms in terms of their social communication abilities. Previous research has proposed that individuals with more severe ADHD symptoms exhibit reduced abilities in using another person's perspective during communication to guide their responses (Nilsen et al., 2013). In essence, those with severe ADHD symptoms encounter greater difficulties in social communication. The contradictory results may be attributed to several factors. Firstly, the tools used to measure ADHD symptoms and social communication skills relied on self-reported assessments, which are susceptible to bias. Participants may opt for answers deemed socially acceptable rather than providing truthful responses, potentially leading to an inaccurate self-assessment. To address this, a combination of self-reporting and peer or observer-rated scales may offer a more comprehensive perspective and help validate the findings. Secondly, it is important to note that university students generally exhibit a high level of communication skills. Previous study highlighted that tertiary educational institutions play a significant role in enhancing communication skills (Sabbah et al., 2020). These institutions provide a range of opportunities for students to develop and refine their communication skills.

## CONCLUSION

This study seeks to examine the prevalence of depression, anxiety, stress, and the occurrence of suspected ADHD among undergraduate students. The findings reveal that 39.0% of the participants are suspected of having ADHD, with a significant proportion of students experiencing high levels of depression, anxiety, and stress. However, a relatively small percentage (3.74%) of participants exhibit poor communication skills. Notably, only 18.2% of the students in the study reported seeking counselling services provided by the university. Moreover, this study corroborates the hypothesis, demonstrating statistically significant differences in ADHD symptoms, depression, anxiety, stress, and social communication skills between adults with and without ADHD symptoms. Besides, the findings indicate moderate associations between ADHD symptoms and depression, anxiety, and stress. However, a weaker association is observed between ADHD symptoms and social communication skills. These findings hold significant value in raising awareness about the need to address ADHD symptoms among adults, particularly university students.

Other than that, they underscore the importance of early diagnosis and intervention for promoting the mental health and overall well-being of students who may be experiencing symptoms of ADHD or other mental health issues.

## **LIMITATIONS OF THE STUDY AND FUTURE RECOMMENDATIONS**

This study possesses several limitations that warrant acknowledgement. Firstly, the sample size, when compared to the overall population of undergraduate students, was relatively small. Besides, a substantial majority of the participants were female, resulting in an imbalanced gender ratio of approximately 8:2. Consequently, the findings derived from this study may be more representative of females, and their applicability to undergraduate students across Malaysia may be limited. Multiple factors could contribute to the skewed gender distribution in this study. National statistics from 2020 indicate a notably higher proportion of female students in public universities, with a female-to-male ration of 6:4 (Hirschmann, 2022). Other than that, this study utilized snowball sampling, which relies on existing participants to recruit future participants from their social networks. Therefore, a larger and more diverse sample, encompassing male students, may have been less inclined to participate after receiving invitations. Secondly, the tools employed in the study consisted of self-reported questionnaires, which can introduce self-reporting bias. Participants may not always provide completely honest responses, may face difficulties recalling information accurately, or may exhibit stigma towards mental health conditions (Althubaiti, 2016; Sartorius, 2007). Finally, it is important to acknowledge that the sample size was relatively small, and the findings should not be generalized. Moreover, the findings of this study do not provide sufficient evidence to establish causal relationships between the variables. Notwithstanding these limitations, the findings from this study can act as preliminary findings, offering a foundation for more comprehensive research in the future. Therefore, we encourage future researchers to adopt a mixed-methods approach that combines quantitative (e.g., self-reported and third-party reported questionnaires) and qualitative research (e.g., interviews) to delve deeper into the complexities of comorbidity between ADHD and mental health and its impact on social communication skills.

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