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Research Article

Depression, Anxiety, Stress, and Associated Factors among Health Sciences Students: A Cross-Sectional Study

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Background

Health sciences students are at increased risk of psychological distress due to academic workload, clinical responsibilities, and the pressures associated with life transitions. Although global data indicate high rates of depression, anxiety, and stress (DAS), evidence regarding the prevalence of, and associated psychosocial and academic factors for, DAS in Saudi Arabia remains limited.

Objective

This study assessed the prevalence of DAS among undergraduate health sciences students in Saudi Arabia and examined demographic, academic, and psychosocial predictors of these outcomes.

Methods

A cross-sectional online survey was conducted among 823 undergraduate students enrolled in health sciences programs at public and private universities in Saudi Arabia. Participants completed a validated Arabic version of the DAS scale. Scores for each subscale were classified according to standardized severity cutoffs. Group differences were examined using one-way analysis of variance (ANOVA) and Chi-square tests. Binary logistic regression analyses were performed to identify independent predictors of DAS, with statistical significance set at $p<0.05$.

Results

A substantial proportion of students reported moderate-to-extremely severe DAS symptoms. One-way ANOVA revealed significant differences in depression scores across academic years ($p<0.001$), with higher levels among senior students. The Chi-square tests indicated no significant gender differences in stress ($p=0.210$). Regression analysis

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identified higher academic workload and limited social support as strong predictors of elevated DAS levels. Despite a moderate willingness to seek psychological support, actual utilization of professional services remained low.

Conclusion

DAS symptoms are prevalent among health sciences students in Saudi Arabia, particularly among students in their later academic years. These findings highlight the need for targeted, culturally sensitive mental health interventions that address academic pressure, strengthen emotional support systems, and enhance access to appropriate psychological care.

1. INTRODUCTION

University students, particularly those enrolled in health sciences programs, are increasingly vulnerable to psychological distress, including depression, anxiety, and stress (DAS). This vulnerability stems from the interplay of academic overload, the emotional demands of clinical practice, and the pressures associated with life transitions. Globally, a systematic review found that approximately 27.2% of medical students experienced depressive symptoms and 11.1% reported suicidal ideation, with many not seeking support due to stigma and fear of judgment.[1] A meta-analysis conducted during the COVID-19 pandemic further revealed pooled prevalence rates of 45% for anxiety and 48% for depression among medical students.[2]

In the Middle East, particularly Saudi Arabia, the mental health burden among health sciences students is comparable to global figures. Several studies have reported DAS prevalence rates exceeding 40% among undergraduate medical and pharmacy students.[3-5] For example, at King Khalid University, 43% of health sciences students exhibited depressive symptoms, 47% reported anxiety, and 30% experienced high stress.[6] Similarly, data from Qassim University showed elevated levels of DAS, highlighting its widespread nature.[7]

Academic pressure—such as examinations, workload intensity, and clinical placements—is a major contributor to psychological distress.[8-10] These demands are compounded by lifestyle factors such as sleep deprivation, poor time management, and unhealthy coping strategies.[11] A qualitative study among Saudi health sciences students also emphasized the influence of cultural expectations and strong parental pressure on emotional well-being.[12] Despite the high burden, mental health service utilization remains limited. Perceived public stigma, personal beliefs about mental illness, and the lack of culturally sensitive counseling services deter students from seeking help.[13-15] In a cross-national study involving 13 universities, stigma significantly reduced help-seeking behavior among students.[16] Moreover, students often rely on informal support networks, such as family or peers, rather than professional services.[17]

The consequences of untreated DAS extend beyond student well-being. Psychological distress is associated with reduced academic performance, including lower grade point average, impaired concentration, and absenteeism.[18] Chronic stress may also lead to burnout, diminished clinical competence, and increased dropout rates from medical programs.[19]

Although empirical research on student mental health in Saudi Arabia is expanding, most studies have examined either the prevalence or associated factors separately. This limits the development of comprehensive prevention and intervention strategies. Therefore, a study that integrates both prevalence estimation and the examination of psychosocial and academic determinants is needed to support tailored, evidence-based solutions for university settings.

This study aims to: (i) Determine the prevalence of depression, anxiety, and stress among health sciences students in Saudi Arabia; (ii) identify academic, demographic, and psychosocial predictors of DAS; and (iii) assess students' willingness to seek psychological support. The findings are intended to guide targeted mental health interventions in university contexts.

2. METHODS

2.1. STUDY DESIGN AND SETTING

This study employed a cross-sectional, descriptive-analytical design to examine the prevalence and associated factors of DAS among undergraduate students enrolled in health sciences programs. Data were collected between March 21 and May 11, 2025, from a range of public and private universities across Saudi Arabia.

2.2. STUDY POPULATION AND ELIGIBILITY CRITERIA

Participants were undergraduate students aged 18 years or older who were actively enrolled in a health-related academic program at the time of data collection. Only students who were able to independently complete an online questionnaire in Arabic were eligible for inclusion. A total of 823 valid responses were included in the final analysis.

2.3. SAMPLING STRATEGY AND RECRUITMENT PROCEDURES

A convenience sampling method was used. Recruitment was conducted through institutional email announcements, social media platforms (e.g., WhatsApp and Telegram), and in-class notifications. The survey was hosted on a secure online platform (Google Forms), and students were provided with a brief explanation of the study aims and a digital informed consent form before participation. No personally identifiable information was collected, and participation was voluntary and anonymous. The estimated completion time ranged from 4 to 6 min.

2.4. INSTRUMENTS AND MEASURES

The structured online questionnaire consisted of four sections: (i) Demographic information – included age, gender, academic major, year of study, type of institution (public or private), living arrangement, and employment status. (ii) Depression, anxiety, and stress scale (DASS-21) – a validated 21-item Arabic version was used to assess DAS

symptoms. Each of the three subscales included seven items rated on a 5-point Likert scale, where 0 represents "Never" and 4 reflects "Almost always." Example items include "I felt down-hearted and blue" (depression), "I felt I was close to panic" (anxiety), and "I found it hard to wind down" (stress). Higher scores indicate greater symptom severity. Scoring followed the standardized DASS-21 manual guidelines. Severity classifications were based on the following cutoffs: Depression (normal: 0–9; mild: 10–13; moderate: 14–20; severe: 21–27; extremely severe: ⩾28), anxiety (normal: 0–7; mild: 8–9; moderate: 10–14; severe: 15–19; extremely severe: ⩾20), and stress (normal: 0–14; mild: 15–18; moderate: 19–25; severe: 26–33; extremely severe: ⩾34). For regression analyses, each subscale was dichotomized as "presence" (moderate-to-extremely severe) versus "absence" (normal-to-mild) of symptoms. (iii) Academic and psychosocial predictors – items evaluated perceived academic workload, levels of emotional and social support, and coping strategies (e.g., talking to peers, leisure activities, professional help-seeking). (iv) Help-seeking attitudes – students rated their willingness to seek psychological support using a 5-point agreement scale.

The questionnaire underwent pilot testing with 20 students to assess clarity, readability, and technical reliability. Minor linguistic adjustments were made based on feedback. Field validation incorporated internal logic checks, such as cross-checking the coherence between age and academic year and preventing the submission of incomplete forms through required-response settings.

2.5. DATA QUALITY ASSURANCE

To ensure data integrity, all responses were reviewed for completeness and coherence. Surveys with excessive missing data or implausible response patterns were excluded. The online form included automated logic checks and required-field validation to minimize user error. Automated range checks (e.g., age 18–60) and mutual exclusivity rules (e.g., full-time vs. part-time employment) were also applied.

2.6. STATISTICAL ANALYSIS

Data analysis was conducted using SPSS Statistics version 26 (IBM, United States of America). Descriptive statistics (means, standard deviations, frequencies, and percentages) were computed to summarize participant characteristics. The Chi-square tests were employed to assess associations between dichotomized DAS outcomes and categorical variables such as gender, academic year, and institution type. ANOVA was used to test mean differences in continuous DASS-21 outcomes across academic years and demographic subgroups. Binary logistic regression was performed to identify predictors of DAS, incorporating demographic, academic, and psychosocial variables, with 95% confidence intervals (CIs) and a significance level of $p<0.05$. The Hosmer–Lemeshow test was conducted to assess goodness of fit by evaluating how well the model's predicted probabilities aligned with observed event rates in subgroups of the data.

2.7. ETHICAL CONSIDERATIONS

This study received ethical approval from the Institutional Review Board of the University of Hail (Approval No. H-2025-044). The study adhered to national and institutional ethical standards for human research. Informed consent was obtained digitally before participation, and participants could withdraw at any stage without consequence. Participants were assured of confidentiality and data protection throughout the study.

3. RESULTS

A total of 823 participants were included in the study. The majority were aged 20–24 years (59.5%), followed by those younger than 20 years (18.3%), and a smaller proportion aged 35 years or older (9.8%). Most participants identified as female (76.8%), whereas 22.7% identified as male, and 0.5% preferred not to disclose their gender.

In terms of study program enrollment, most respondents were from allied health and related fields (63.8%), followed by medicine (16.2%), pharmacy (9.6%), nursing (6.3%), and dentistry (4.1%). Regarding academic standing, 1st- and 2nd-year students each comprised 17.0% of the sample, followed by 4th-year students (21.0%), 5th-year or higher students (17.9%), and 3rd-year students (14.9%).

Most participants were enrolled in public institutions (76.7%), whereas 7.4% attended private universities or colleges and 4.9% reported other institutional affiliations. The majority lived with family (74.7%), whereas 7.5% lived off campus in shared housing, 2.4% in on-campus dormitories, and 4.3% reported other living arrangements. With respect to employment status, 68.5% of participants were not engaged in paid work, 15.3% reported part-time employment, and 8.1% reported full-time work (Table 1).

Table 1. Demographic characteristics of participants (*n*=823)

Variable	Category	*n* (%)
Age	Under 20	151 (18.3)
	20–24	490 (59.5)
	25–29	58 (7.0)
	30–34	43 (5.2)
	35 and above	81 (9.8)
Gender	Female	632 (76.8)
	Male	187 (22.7)
	Prefer not to say	4 (0.5)
Study program	Medicine	133 (16.2)
	Pharmacy	79 (9.6)
	Nursing	52 (6.3)
	Dentistry	34 (4.1)
	Other (e.g., allied health)	525 (63.8)
Year of study	1st year	140 (17.0)
	2nd year	140 (17.0)
	3rd year	123 (14.9)
	4th year	173 (21.0)
	5th year or above	147 (17.9)
Institution type	Public university/college	631 (76.7)
	Private university/college	61 (7.4)
	Other	40 (4.9)
Living arrangement	With family	615 (74.7)
	Off-campus/shared housing	62 (7.5)
	On-campus housing (dorm)	20 (2.4)
	Other	35 (4.3)
Employment status	Unemployed (no paid work)	564 (68.5)
	Part-time work	126 (15.3)
	Full-time work	67 (8.1)

Table 2. Frequency of depressive, anxiety, and stress-related symptoms among students (*n*=823)

Symptom	Never %	Rarely %	Sometimes %	Often %	Almost always %
I felt sad or depressed most of the day	5.2 (43)	17.0 (140)	46.8 (385)	22.5 (185)	8.4 (69)
I lost interest in activities	7.3 (60)	15.9 (131)	38.6 (318)	24.5 (202)	13.6 (112)
I felt hopeless about the future	13.4 (110)	18.3 (151)	40.6 (334)	17.5 (144)	10.1 (83)
I felt anxious or worried about many things	5.0 (41)	9.4 (77)	35.6 (293)	28.4 (234)	21.5 (177)
I felt tense or had difficulty relaxing	8.0 (66)	14.1 (116)	38.5 (317)	23.6 (194)	15.7 (129)
I experienced sudden feelings of panic	11.5 (95)	16.8 (138)	37.3 (307)	19.4 (160)	14.8 (122)
I had difficulty coping with academic or personal pressures	4.4 (36)	14.9 (123)	40.6 (334)	24.2 (199)	15.8 (130)
I felt irritable or overreacted to minor annoyances	10.9 (90)	18.2 (150)	38.8 (319)	18.3 (151)	13.6 (112)
I had trouble sleeping due to thoughts or worries	6.8 (56)	17.3 (142)	35.4 (291)	23.3 (192)	17.1 (141)

Table 2 presents the distribution of symptom frequencies. Nearly half of the students (46.8%; *n* = 385) reported feeling sad or depressed most of the day "sometimes," whereas 22.5% (*n* = 185) experienced this "often," and 8.4% (*n* = 69) reported it "almost always." Loss of interest in activities was reported "often" by 24.5% (*n* = 202) and "almost always" by 13.6% (*n* = 112). Feelings of hopelessness were also common, with 40.6% (*n* = 334) reporting this "sometimes" and 10.1% (*n* = 83) "almost always."

Anxiety-related symptoms showed similar patterns. About 28.4% (*n* = 234) often felt anxious or worried about many things, and 21.5% (*n* = 177) reported feeling this "almost always." Difficulty relaxing was reported "sometimes" by 38.5% (*n* = 317) and "often" by 23.6% (*n* = 194). Sudden feelings of panic were experienced "sometimes" by 37.3% (*n* = 307), whereas 14.8% (*n* = 122) reported these "almost always."

Stress indicators were also prevalent. Difficulty coping with academic or personal pressure was reported "sometimes" by 40.6% (*n* = 334) and "almost always" by 15.8% (*n* = 130). Emotional irritability was reported "sometimes" by 38.8% (n = 319), and trouble sleeping due to worry was reported "often" by 23.3% (*n* = 192) and "almost always" by 17.1% (*n* = 141).

A large proportion of students rated their workload as "moderate" (28.3%) or "heavy" (24.3%), with 7.8% describing it as "very heavy" (Table 3). Regarding feeling overwhelmed, 10.0% reported this "sometimes," and 6.8% reported it "almost always."

With respect to support systems, 28.5% of students reported receiving "somewhat" support, and 20.4% reported "yes, definitely" receiving emotional or social support. In contrast, 13.1% reported "not really," and 5.0% reported "not at all."

Leisure and hobbies (23.5%) and talking with friends or family (23.0%) were the most commonly used coping strategies. Physical activity (9.6%) and seeking professional help (1.5%) were reported less frequently.

Figure 1 illustrates students' willingness to seek professional help. Approximately 28.3% reported being "neutral," 21.7% "agreed," and 12.1% responded "yes, definitely." Conversely, 8.1% "disagreed," 9.4% "strongly disagreed," and 3.7% stated they would "not at all" seek professional help. These results reflect a mixed pattern of openness and hesitation toward professional mental health services.

One-way ANOVA indicated a significant difference in depression scores across academic years, $F(4, 818) = 6.42$, $p<0.001$, with higher mean scores observed among 4th- and 5th-year students compared to 1st- and 2nd-year students (Table 4). However, no statistically significant differences were found for anxiety, $F(4, 818) = 1.33$, $p=0.256$, or stress, $F(4, 818) = 1.67$, $p=0.154$.

The Chi-square analysis revealed no significant association between gender and stress, $\chi^2(2, n = 823) = 3.12$, $p=0.210$.

Table 3. Additional academic and mental health measures (*n*=823)

Measure	Item	*n* (%)
Academic workload	Very light	20 (2.4)
	Light	34 (4.1)
	Moderate	233 (28.3)
	Heavy	200 (24.3)
	Very heavy	64 (7.8)
	Sometimes	82 (10.0)
	Often	57 (6.9)
	Almost always	56 (6.8)
	Rarely	49 (6.0)
	Never	27 (3.3)
Emotional or social support	Yes, definitely	168 (20.4)
	Somewhat	234 (28.5)
	Not really	108 (13.1)
	Not at all	41 (5.0)
	Sometimes	80 (9.7)
	Rarely	50 (6.1)
	Never	22 (2.7)
Coping mechanisms	Talking with friends/family	189 (23.0)
	Leisure/hobbies (reading, gaming, arts)	193 (23.5)
	Physical activities	79 (9.6)
	Seeking professional help	12 (1.5)
	Engaging in part-time work	100 (12.2)
	Other	78 (9.5)

Notes: "Intensity" is students' feeling of academic workload (very light to very heavy). "Frequency" is the measure of how often students felt overwhelmed by workload.

A significant association was found between academic year and depression categories, $\chi^2(4, n = 823) = 24.56$, $p<0.001$. In addition, there were no significant associations between gender and depression, $\chi^2(2, n = 823) = 2.45$, $p=0.294$, or between gender and anxiety, $\chi^2(2, n = 823) = 3.89$, $p=0.142$.

3.1. FACTORS ASSOCIATED WITH DAS SYMPTOMS AMONG STUDENTS

To identify factors associated with the outcome variables, both bivariate and multivariable logistic regression analyses were employed. Variables with a *p*-value below 0.25

in the bivariate analysis were included in the multivariable logistic models using a backward stepwise approach. Adjusted odds ratios (AORs) with 95% CIs were calculated to identify independent predictors for DAS. Model diagnostics included checks for multicollinearity (variance inflation factor <2.0) and an assessment of overall model fit using the Hosmer–Lemeshow goodness-of-fit test.

For depression, students under the age of 20 had significantly lower odds of experiencing depressive symptoms compared to those aged 20–24 (AOR = 0.53, 95% CI: 0.284–0.991; p=0.047). In contrast, those aged 35 and above showed a non-significant trend toward higher risk (AOR = 1.82; p=0.055). Students from non-medical health-related fields had twice the odds of reporting depressive symptoms (AOR = 2.00; p=0.048). Third-year students were less likely to report depression compared to 1st-year students (AOR = 0.42; p=0.015). Students enrolled in public universities had higher odds of depression than those in private institutions (AOR = 2.21; p=0.001). Academic workload was also associated with depression: A light workload appeared protective (AOR = 0.58; p=0.040), whereas a moderate workload increased the odds (AOR = 2.05; p<0.001). Students who reported emotional support were also more likely to report depressive symptoms (AOR = 1.66; p=0.007).

In the anxiety model, participants aged 35 and above had significantly higher odds of anxiety symptoms (AOR = 2.86; p=0.001). Pharmacy students were more likely to experience anxiety (AOR = 2.41; p=0.022). Being unemployed (AOR = 2.09; p=0.018) or working part-time (AOR = 3.41; p=0.001) was also associated with greater anxiety risk. Both light (AOR = 2.37; p=0.001) and moderate (AOR = 2.75; p<0.001) academic workloads significantly increased the likelihood of anxiety symptoms.

Regarding stress, those who reported not seeking healthcare when needed had significantly lower odds of stress (AOR = 0.64; p=0.018). Students experiencing a moderate workload were more likely to report stress (AOR = 2.45; p<0.001), while a light workload showed no significant association. Older age (⩾35) was also a significant predictor of stress (AOR = 2.03; p=0.026). Students in public institutions (AOR = 2.05; p=0.002) and those with part-time jobs (AOR = 2.12; p=0.046) were more likely to report stress symptoms. Emotional support was not significantly associated with stress in this model (p=0.235; Table 5).

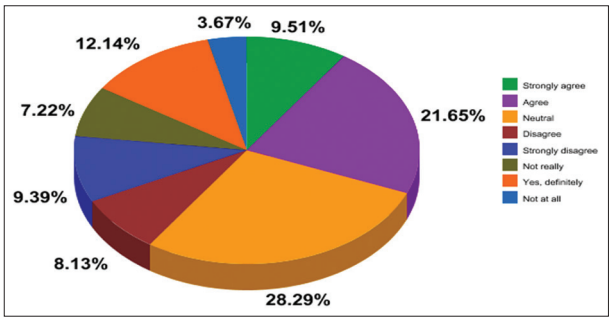

Figure 1. Willingness of health sciences students to seek professional help (n = 823)

4. DISCUSSION

We investigated the prevalence and predictors of DAS among health sciences students in Saudi Arabia and found notably high levels of psychological distress across all academic years. Nearly half of the participants reported depressive symptoms such as persistent sadness and lack of motivation, while a substantial proportion also reported anxiety and stress symptoms. These findings align with previous national and international studies reporting elevated rates of mental health problems among health sciences students.[1-4]

Depression levels were significantly associated with the academic year, with higher rates observed among senior students. This trend likely reflects the cumulative effect of clinical training, increased academic workload, and heightened concerns about career readiness. Similar patterns have been documented in studies from Brazil and Saudi Arabia, where students in advanced years reported greater emotional strain.[6,10] Anxiety and stress were prevalent across all academic years, with no statistically significant differences between groups, indicating a persistent mental health burden throughout students' training.[3,4]

Unlike earlier research highlighting gender differences in psychological distress,[2,8] our findings showed no significant association between gender and stress. This may reflect evolving social dynamics, more equitable coping resources, or other influencing factors such as sleep quality, social support, and study habits. Future research should examine these interactions further to clarify gender-related mental health patterns in this population.

Stress-related symptoms—particularly sleep disturbances and irritability, along with academic pressure—were common, consistent with prior research on the impact of sleep problems on mental well-being.[11] Emotional and social support emerged as important protective factors. Students who reported stronger emotional support expressed greater willingness to seek professional

Table 4. Group comparisons using ANOVA and Chi-square tests (n=823)

Variable comparison	Statistical test	*df*	Statistics (F or χ^2)	*p*
Academic year×depression (continuous)	ANOVA	4,818	F=6.42	<0.001*
Academic year×anxiety (continuous)	ANOVA	4,818	F=1.33	0.256
Academic year×stress (continuous)	ANOVA	4,818	F=1.67	0.154
Gender×depression (categorical)	Chi-square	2	χ^2=2.45	0.294
Gender×anxiety (categorical)	Chi-square	2	χ^2=3.89	0.142
Gender×stress (categorical)	Chi-square	2	χ^2=3.12	0.210
Academic year×depression (categorical)	Chi-square	4	χ^2=24.56	<0.001*

Notes: Depression, anxiety, and stress scores were analyzed as both continuous (ANOVA) and categorical (Chi-square) variables. Results are significant at p<0.05. The asterisk (*) in the footnote denotes statistical significance at p<0.05 (two-tailed) for the tests reported (ANOVA/Chi-square) in the table
Abbreviation: ANOVA: Analysis of variance.

Table 5. Multivariable logistic regression results for depression, anxiety, and stress

Model	Variable	Category	AOR	95% CI	*p*
Depression	Age	Under 20	0.53	(0.284, 0.991)	0.047
Depression	Age	25–29	0.958	(0.528, 1.737)	0.887
Depression	Age	30–34	0.893	(0.461, 1.731)	0.738
Depression	Age	35 and above	1.819	(0.988, 3.35)	0.055
Depression	Field of study	Other	2.002	(1.005, 3.988)	0.048
Depression	Year of study	3rd year	0.416	(0.205, 0.842)	0.015
Depression	Institution type	Public university/college	2.206	(1.405, 3.462)	0.001
Depression	Academic workload	Light	0.582	(0.347, 0.975)	0.04
Depression	Academic workload	Moderate	2.047	(1.475, 2.841)	0.0001
Depression	Emotional support	Yes	1.661	(1.147, 2.406)	0.007
Anxiety	Age	35 and above	2.862	(1.518, 5.397)	0.001
Anxiety	Field of study	Pharmacy	2.405	(1.132, 5.112)	0.022
Anxiety	Employment	Unemployed	2.093	(1.136, 3.858)	0.018
Anxiety	Employment	Part-time work	3.408	(1.607, 7.226)	0.001
Anxiety	Academic workload	Light	2.368	(1.398, 4.011)	0.001
Anxiety	Academic workload	Moderate	2.753	(2.017, 3.757)	0.0001
Stress	Emotional support	Yes	1.245	(0.868, 1.786)	0.235
Stress	Healthcare seeking	No	0.639	(0.44, 0.927)	0.018
Stress	Academic workload	Light	1.144	(0.686, 1.91)	0.606
Stress	Academic workload	Moderate	2.446	(1.79, 3.344)	0.0001
Stress	Age	35 and above	2.028	(1.09, 3.774)	0.026
Stress	Institution type	Public	2.051	(1.308, 3.217)	0.002
Stress	Employment	Part-time	2.116	(1.014, 4.416)	0.046

Abbreviations: AOR: Adjusted odds ratio; CI: Confidence interval.

psychological help. However, actual utilization of services remained low, with only 1.5% of participants seeking professional assistance. This gap between intention and action echoes findings from previous studies, including those by Gulliver *et al*.[14]

Cultural stigma and misconceptions remain major barriers to help-seeking. Previous research from Saudi Arabia and other contexts has shown that stigma, confidentiality concerns, and limited awareness discourage students from accessing mental health services.[13-16] Our findings support this, as many students preferred informal support from family or peers over professional help—a trend also reported by Rickwood *et al*.[17]

A key contribution of this study is its integration of academic, behavioral, and psychosocial variables into a single model of DAS risk. The results highlight the role of institutional policies and campus culture in shaping student mental health. Targeted initiatives—such as stigma-reduction campaigns, culturally appropriate digital interventions, and structured mental health services—should be prioritized.[20]

Although students expressed moderate openness to seeking psychological support, actual service utilization was limited. This pattern mirrors earlier findings by Alhur and Alhur[20] and Alhur *et al*.,[21] who reported widespread interest in digital mental health interventions such as telepsychology but limited real-world adoption. Barriers such as low digital health literacy, limited promotion, and confidentiality concerns may contribute to this gap.[22]

Overall, these findings emphasize the need for proactive university-level strategies to support student mental health at both structural and individual levels. Programs should be tailored to the academic stage, address specific stressors, and be sensitive to cultural factors. Future studies should adopt longitudinal designs to better capture changes over time and assess the effectiveness of digital and hybrid mental health interventions in the Saudi context.

5. LIMITATIONS

This study provides important evidence regarding the mental health of health sciences students in Saudi Arabia, but several limitations should be acknowledged. First, the cross-sectional design limits the ability to establish causality; associations between academic variables and psychological symptoms should not be interpreted as directional or temporal. Second, the use of convenience sampling may have introduced selection bias, as students with greater mental health concerns may have been more inclined to participate, potentially affecting prevalence estimates.

6. CONCLUSION

This cross-sectional survey examined the prevalence and predictors of DAS among health sciences students in Saudi Arabia. The findings revealed several demographic, academic, and psychosocial factors significantly associated with elevated symptom levels. Psychological distress was evident across all academic levels and disciplines, with depressive symptoms particularly pronounced among senior students. Although students expressed a general willingness to seek psychological support, actual utilization of professional services remained limited. These results highlight the urgent need for university-level strategies that address mental health through stigma reduction, expanded access to counseling, and culturally appropriate digital support

interventions. Prioritizing student mental health is crucial not only for individual well-being but also for academic performance and the future quality of the healthcare workforce.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest related to this study.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study received ethical approval from the Institutional Review Board of the University of Hail (Approval No. H-2025-044). The study followed national and institutional ethical standards for human research. Informed consent was obtained digitally before participation, and participants could withdraw at any stage without consequence. Participants were assured of confidentiality and data protection throughout the study.

CONSENT FOR PUBLICATION

Not applicable, as no identifiable personal or clinical information was published.

DATA AVAILABILITY STATEMENT

The anonymized dataset generated during this study is available from the corresponding author upon reasonable request.

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