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The Impact of Mental Health Distress on Academic Performance in Undergraduate Medical Education

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ABSTRACT

Mental health distress is a significant concern among medical students due to the high demands of medical training, which can negatively impact both well-being and academic performance. This study aimed to investigate the relationship between mental health status and academic performance among medical students. A cross-sectional survey was conducted with 214 medical students at Al-Rayan National Colleges. Mental health distress was measured using the General Health Questionnaire-12 (GHQ-12), and GPA served as the indicator of academic performance. Data analysis included descriptive statistics, t-tests, ANOVA, and multivariate regression to examine associations between GHQ-12 factors and GPA categories. Higher levels of Anxiety and Depression and Social Dysfunction were significantly associated with lower GPA. Specifically, 52.9% of students classified as High-risk for Anxiety and Depression ($P < 0.01$) and 48.3% classified as High-risk for Social Dysfunction ($P = 0.05$) obtained a Moderately Good or Poor GPA. In contrast, 64.9% of students with Normal levels of Loss of Confidence achieved a Good GPA, with no significant association found between Loss of Confidence and academic performance ($P = 0.752$). These findings highlight that Anxiety and Depression and Social Dysfunction are more directly linked to academic outcomes than Loss of Confidence. These findings underscored the importance of addressing mental health distress in medical education. Integrating mental health services and fostering a supportive academic environment enhances academic performance. Future longitudinal studies are recommended to further understand the impact of mental health on academic success and develop effective intervention strategies.

INTRODUCTION

Mental health distress is increasingly recognized as a critical issue in higher education, particularly among medical students who face a unique set of stressors compared to students in other fields. The high demands of medical training, which include rigorous coursework, intensive clinical rotations, and high-stakes evaluations, create a challenging environment that can negatively impact students' mental well-being (Arif *et al.*, 2021; Rotenstein *et al.*, 2016). Addressing mental health issues within this group is essential, as the well-being of medical students affects not only their academic performance but also their future competence as healthcare providers, highlighting the importance of supporting mental health in medical education (Langness *et al.*, 2022; Yusoff & Abdul Rahim, 2013).

Extensive research has recorded elevated incidences of mental health disorders, including anxiety, depression, and social dysfunction, among medical students globally. Studies indicate that these students endure greater psychological suffering compared to their counterparts in other fields, frequently intensified by anxiety around academic failure and the elevated demands of medical education (Abdulghani *et al.*, 2011; Dendle *et al.*, 2018). Depression rates among medical students vary from 11% to 26.2%, with preclinical students and those residing at home frequently exhibiting heightened vulnerability to depressive symptoms (Dessauvage *et al.*, 2022; Jahrami

et al., 2023). Moreover, female students, individuals attending private colleges, and those with a familial predisposition to mental disease exhibit a heightened likelihood of experiencing mental health distress, with prevalence estimates varying between 14.5% and 55.8% across different research (Arif *et al.*, 2021; Langness *et al.*, 2022).

Despite comprehensive research on the prevalence of mental health concerns, there is a paucity of examination into the correlation between specific mental health issues and academic performance, such as Grade Point Average (GPA), particularly within the Middle Eastern environment. Although many studies have investigated the academic repercussions of mental health disorders in medical students, less research has focused on the impact of specific psychological characteristics, such as anxiety and depression, social dysfunction, and diminished self-confidence, on academic performance. This discrepancy highlights the necessity for focused investigation to comprehend how these particular aspects influence pupils' educational outcomes (Chu *et al.*, 2023; Lin *et al.*, 2024; Pereira *et al.*, 2022).

This study aimed to investigate the correlation between mental health distress, assessed by the General Health Questionnaire-12 (GHQ-12), and academic performance among medical students at Al-Rayan National Colleges in Saudi Arabia. This study aimed to evaluate the impact of three psychological factors-anxiety and depression, social

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dysfunction, and loss of confidence-on students' GPAs, elucidating the relationship between these dimensions of mental health distress and academic performance (Abozaid, 2024; Arif *et al.*, 2021).

Findings from this research have the potential to justify the implementation of targeted mental health interventions within medical institutions. Establishing a supportive environment for mental health may not only improve students' academic outcomes but also enhance their resilience and competence as future healthcare professionals, contributing positively to the overall quality of medical care (Ferguson *et al.*, 2022; Julien-Chinn *et al.*, 2024)

MATERIALS & METHODS

Study Design

This study used a cross-sectional design to examine the association between mental health distress, as measured by the General Health Questionnaire-12 (GHQ-12), and academic performance among medical students.

Study Setting

The study was conducted at the Faculty of Medicine, Al-Rayan National Colleges, located in Al-Madinah Al-Munawwarah, Saudi Arabia. Data collection took place over a two-month period from September to October 2023.

Population

The target population comprised all medical students enrolled at Al-Rayan National Colleges during the 2023-2024 academic year, including students from all academic years. This population was selected to ensure a diverse sample in terms of academic experience and stress exposure.

Sampling Technique and Sample Size

A census sampling technique was used, inviting all 900 enrolled medical students to participate in the study to maximize representativeness. Of these, 214 students responded, yielding a response rate of 23.8%. The study aimed to include as many students as possible to gain a comprehensive view of mental health distress across various academic levels.

Data Collection Tool

Data were collected using a structured questionnaire consisting of two main sections:

GHQ-12: A validated tool used to assess mental health distress across three psychological factors: Anxiety and Depression, Social Dysfunction, and Loss of Confidence. Each factor was scored on a Likert scale from 0 to 3, with total scores categorized as Normal (0-12), High-risk (13-24), and Severe (25-36). Demographic and Academic Information: Participants provided demographic data (age, gender, nationality, socioeconomic status) and self-reported GPA, which was categorized into three levels: Good GPA (A+, A, B+), Moderately Good GPA (C+, C), and Poor GPA (D+, D, F). The questionnaire was distributed both online via WhatsApp and in person through classroom visits, which helped increase the response rate and reach a broader audience.

Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics summarized demographic information, GHQ-12 classifications, and GPA categories. Comparative analyses, including t-tests and ANOVA, were conducted to examine differences in GHQ-12 scores across GPA levels. Pearson's correlation coefficients assessed the relationship between GHQ-12 scores and GPA. Additionally, multivariate regression analysis was performed to control confounders (e.g., gender, age, academic year) and evaluate the predictive effect of GHQ-12 factors on academic performance. Missing data were excluded from the analysis.

Ethical Approval

The study received ethical approval from the Al-Rayan Colleges Ethics Committee. Informed consent was obtained from all participants, and participation was voluntary and anonymous. The work was conducted following the Declaration of Helsinki. All participants were provided with information on the study and signed consent. Students were assured that their responses would remain confidential and that their participation would not impact their academic standing.

RESULTS AND DISCUSSION

A total of 214 medical students were recruited in this study, predominantly female (67.3%) and within the age range of 18-25 years (98.2%). Most participants were Saudi nationals (83.6%) and single (95.8%). In terms of socioeconomic status, the majority identified as middle-income (55.6%), while 24.3% preferred not to disclose their income level. Further details in Table 1.

Table 1: Socio-Demographics of Study Participants

Variable	Category	Frequency (n)	Percent (%)
	Female	144	67.3
	Male	43	20.1
Age Group	18-21 years	114	53.3
	22-25 years	96	44.9
	26-29 years	3	1.4
	Above 34 years	1	0.5

Nationality	Non-Saudi	35	16.4
	Saudi	179	83.6
Marital Status	Divorced	2	0.9
	Married	7	3.3
	Single	205	95.8
Socioeconomic Status	Low-income	9	4.2
	Middle-income	119	55.6
	High-income	34	15.9
	Not sure/Prefer not to answer	52	24.3
Total		214	100.0

The GPA distribution among 214 medical students (Figure 1) reveals that the majority achieved a B+ or higher, indicating strong academic performance within the cohort. A and A+ grades were the most common, collectively representing nearly half of the students,

while lower grades were less frequent, with only 11.2% receiving a C+ and 7.0% scoring below. These findings highlight the high academic standards observed in this group (Figure 1).

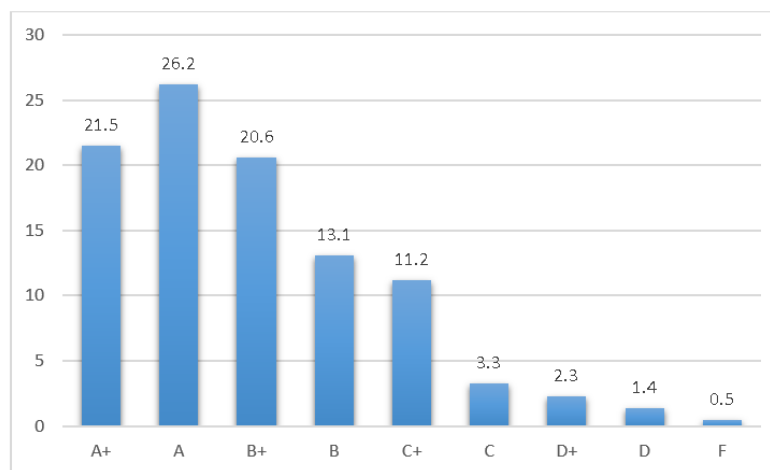


Figure1: Distribution of Grade Point Average (GPA) Among Medical Students

Distribution of GHQ-12 Mental Health Classifications (Normal, High-risk, Severe) Across GPA Categories

The distribution of GPA levels across GHQ-12 classifications highlights a clear association between mental health distress and academic performance. Students classified as High-risk represented the majority in both the good GPA category (58%) and the moderately good

GPA group (80.6%), as well as among those with poor GPAs (77.8%). In contrast, students classified as Normal accounted for 36.2% of those with good GPAs, 12.9% with moderately good GPAs, and 22.2% with poor GPAs. Severe cases were minimal, comprising only 5.7% of those with good GPAs and 6.5% with moderately good GPAs, with none in the poor GPA category. Figure2

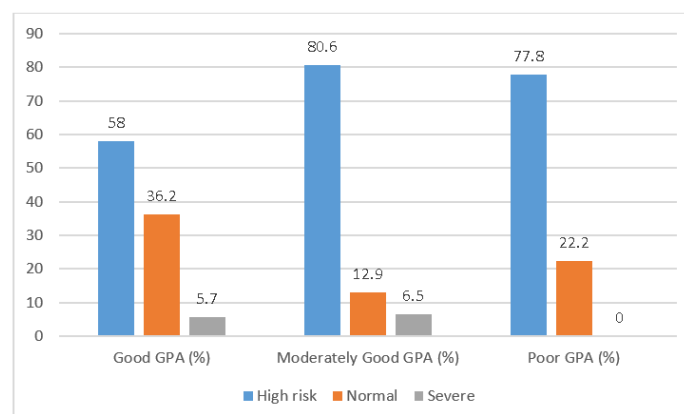


Figure2: Proportion of GHQ-12 Mental Health Classifications Across GPA Categories

Distribution of GHQ-12 Mental Health Classifications (Anxiety and Depression, Social Dysfunction, and Loss of Confidence) Across GPA Categories

The association between GHQ-12 mental health classifications and GPA categories is further summarized in Table 2. Among students classified as High risk for Anxiety & Depression, 52.9% achieved a Good GPA, while 45.2% and 44.4% were in the Moderately Good and

Poor GPA categories, respectively, indicating a significant relationship with academic performance ($P < 0.01$). In contrast, the Loss of Confidence and Social Dysfunction classifications showed no significant associations across GPA categories, with P-values of 0.752 and 0.427, respectively. This table highlights that Anxiety & Depression levels have a stronger link to GPA outcomes than other mental health factors.

Table 2: Distribution of GHQ-12 Mental Health Classifications Across GPA Categories

Classification	State	Good GPA n (%)	Moderate GPA n (%)	Poor GPA n (%)	Total	P value
Anxiety & Depression Classification	High risk	92 (52.9%)	14 (45.2%)	4 (44.4%)	110 (51.4%)	$P < 0.01$
	Normal	50 (28.7%)	3 (9.7%)	1 (11.1%)	54 (25.2%)	
	Severe	32 (18.4%)	14 (45.2%)	4 (44.4%)	50 (23.4%)	
Loss of Confidence Classification	High risk	48 (27.6%)	12 (38.7%)	2 (22.2%)	62 (29.0%)	0.752
	Normal	113 (64.9%)	17 (54.8%)	6 (66.7%)	136 (63.6%)	
	Severe	13 (7.5%)	2 (6.5%)	1 (11.1%)	16 (7.5%)	
Social Dysfunction Classification	High risk	84 (48.3%)	20 (64.5%)	6 (66.7%)	110 (51.4%)	0.427
	Normal	83 (47.7%)	10 (32.3%)	3 (33.3%)	96 (44.9%)	
	Severe	7 (4.0%)	1 (3.2%)	0 (0.0%)	8 (3.7%)	
Total		174 (100.0%)	31 (100.0%)	9 (100.0%)	214 (100.0%)	

Comparison of Mean GHQ-12 Factor Scores Across GPA Classifications

Students with lower GPAs exhibited higher Anxiety & Depression and Social Dysfunction scores, indicating greater psychological distress. Those with a Good GPA had the lowest Anxiety & Depression (mean = 5.93, SD = 2.63) and Social Dysfunction (mean = 6.51, SD = 3.45) scores, while students in the Moderately Good and Poor GPA categories reported higher distress levels,

with Anxiety & Depression and Social Dysfunction scores exceeding 7.7. GHQ-12 Overall scores followed a similar pattern, with significantly higher distress levels among students with lower academic performance ($P < 0.01$). Conversely, Loss of Confidence scores did not vary significantly across GPA categories ($P = 0.354$), suggesting a weaker association with academic performance compared to the other mental health factors. Further details in table 3.

Table 3: Comparison of Mean GHQ-12 scores Across GPA Classifications (Likert's Scale)

GPA Classification	Scores			
	Anxiety & Depression	Social Dysfunction	Loss of Confidence	Overall scores
Good GPA	5.93 (2.63)	6.51 (3.45)	1.99 (1.68)	14.43 (5.93)
Moderately Good GPA	7.74 (2.32)	7.77 (2.80)	2.39 (1.61)	17.90 (4.43)
Poor GPA	7.78 (2.22)	7.78 (1.99)	2.33 (1.87)	17.89 (4.78)
P value	$P < 0.001$	$P < 0.05$	0.354	$P < 0.01$
Total	6.27 (2.66)	6.74 (3.34)	2.07 (1.67)	15.07 (5.84)

Correlation Between GPA and Mental Health Indicators
GPA was significantly correlated with Anxiety & Depression ($r = 0.360$, $P < 0.001$), Social Dysfunction ($r = 0.212$, $P < 0.01$), and GHQ-12 Overall scores ($r = 0.305$, $P < 0.001$), indicating that greater psychological distress is linked to poorer academic performance.

Loss of Confidence showed no significant correlation with GPA ($r = 0.103$, $P = 0.135$). Additionally, strong intercorrelations were observed among the GHQ-12 subscales, with Anxiety & Depression and Social Dysfunction showing the strongest associations with overall mental health distress. Further details in table 4.

Table 4: Correlation Between GPA and Mental Health Indicators

Correlation		Scores				
		Grade point average (GPA)	Anxiety & Depression	Social Dysfunction	Loss of Confidence	Overall scores
Grade point average (GPA) Likert scale	Correlation Coefficient	1.000	.360**	.212**	.103	.305**
	Sig. (2-tailed)	.	P<0.001	P<0.01	.135	P<0.001
Anxiety & Depression score	Correlation Coefficient	.360**	1.000	.295**	.427**	.734**
	Sig. (2-tailed)	.000	.	P<0.001	P<0.001	P<0.001
Social Dysfunction score	Correlation Coefficient	.212**	.295**	1.000	.410**	.799**
	Sig. (2-tailed)	.002	.000	.	P<0.001	P<0.001
Loss of Confidence score	Correlation Coefficient	.103	.427**	.410**	1.000	.717**
	Sig. (2-tailed)	.135	.000	.000	.	P<0.001
GHQ-12 overall score Likert scoring	Correlation Coefficient	.305**	.734**	.799**	.717**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.

***. Correlation is significant at the 0.01 level (2-tailed).*

Regression Analysis of Mental Health Factors and Academic Performance

The regression analysis identified Anxiety & Depression as a significant predictor of lower GPA ($B = 0.155$, $p = 0.002$), indicating that increased psychological distress in this domain negatively impacts academic performance.

Social Dysfunction ($B = 0.031$, $p = 0.392$) and Loss of Confidence ($B = -0.077$, $p = 0.305$) were not significantly associated with GPA, as their confidence intervals included zero, suggesting a weaker or no direct effect on academic outcomes. Further details in table 5.

Table 5: Regression Analysis of Mental Health Factors and Academic Performance (GPA)

Coefficients a							
Model	Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.	95.0% Confidence	
	B	Std. Error	Beta			Lower	Upper
Anxiety & Depression score	.155	.048	.242	3.207	.002	.060	.251
Social Dysfunction score	.031	.036	.061	.858	.392	-.041	.103
Loss of Confidence score	-.077	.075	-.076	-1.028	.305	-.226	.071

Discussion

This study investigated the association between mental health distress, as measured by the General Health Questionnaire-12 (GHQ-12), and academic performance among medical students at Al-Rayan National Colleges. It examined how three psychological factors—Anxiety and Depression, Social Dysfunction, and Loss of Confidence—correlate with students' Grade Point Averages (GPA). The findings indicated that Anxiety and Depression significantly impact academic performance, while Social Dysfunction showed a weaker association, and Loss of Confidence did not significantly correlate with GPA.

The results demonstrated that higher Anxiety and Depression scores were significantly associated with lower GPA ($P < 0.001$). Correlation analysis revealed a strong negative relationship ($r = 0.360$, $P < 0.001$), and

regression analysis confirmed Anxiety and Depression as a significant predictor of academic performance ($B = 0.155$, $P = 0.002$). These findings align with previous research indicating that anxiety and depression impair cognitive function, attention, memory, and motivation, which are essential for academic success. A study by Yusoff *et al.* similarly reported that medical students with higher anxiety levels exhibited significantly lower academic performance, underscoring the impact of psychological distress on learning efficiency (Hill *et al.*, 2018; Hope & Henderson, 2014; Julien-Chinn *et al.*, 2024).

Additionally, Abdulghani and Cuttilan found that depressive symptoms among medical students correlated with increased academic difficulties, primarily due to fatigue, impaired concentration, and reduced coping capacity. Furthermore, a meta-analysis by Hope and Henderson indicated that students with depressive

symptoms had twice the likelihood of experiencing academic setbacks compared to their peers without psychological distress (Abdulghani *et al.*, 2011; Dessauvage *et al.*, 2022).

However, some studies present conflicting findings. For instance, research by Stegers-Jager *et al.* among Dutch medical students found no direct correlation between anxiety and academic performance, suggesting that certain students may develop adaptive coping strategies to maintain academic achievement despite distress. This discrepancy may be attributed to differences in cultural perceptions of mental health, curriculum design, and support systems available to students, emphasizing the need for further investigation in diverse educational settings (Picton *et al.*, 2022).

The association between Social Dysfunction and GPA was weaker than that of Anxiety and Depression. While students with lower GPAs exhibited higher Social Dysfunction scores ($P < 0.05$), correlation analysis revealed only a weak negative relationship ($r = 0.212$, $P < 0.01$), and regression analysis did not identify Social Dysfunction as a significant predictor of GPA ($B = 0.031$, $P = 0.392$). This suggests that while social difficulties contribute to psychological distress, they may not directly lead to academic decline.

Previous research supports this conclusion. Dyrbye *et al.* identified social isolation and lack of peer support as stressors that contribute to medical student burnout, which may indirectly affect academic engagement (Langness *et al.*, 2022). Similarly, Goldberg and Williams noted that students with higher social dysfunction scores reported challenges in team-based learning and clinical interactions, which could influence academic performance (Goldberg & Williams, 1988).

Conversely, findings by Slavin *et al.* suggest that Social Dysfunction has a stronger impact on academic performance than previously assumed. Their study found that students with higher levels of social dysfunction were more likely to exhibit avoidance behaviors, reduced class attendance, and diminished participation in group discussions, ultimately affecting their academic outcomes. The inconsistency in findings may be explained by differences in institutional policies, peer-support programs, and faculty mentorship that influence how students cope with social dysfunction (Abozaid, 2024).

Unlike Anxiety and Depression, Loss of Confidence did not significantly correlate with GPA ($r = 0.103$, $P = 0.135$), and regression analysis confirmed it was not a significant predictor ($B = -0.077$, $P = 0.305$). While students with lower GPAs exhibited slightly higher Loss of Confidence scores, the difference was not statistically meaningful ($P = 0.354$).

This finding contrasts with studies emphasizing the role of self-confidence in academic success. Patel *et al.* and Yusoff *et al.* reported that self-efficacy and confidence positively influence students' motivation, problem-solving abilities, and academic persistence. Bandura's

self-efficacy theory (1997) similarly posits that students with higher confidence levels are more likely to engage in proactive learning behaviors, leading to improved academic outcomes (Hope & Henderson, 2014; Pereira *et al.*, 2022).

However, other studies support the present findings. Lipson and Eisenberg (2018) noted that while confidence levels fluctuate during medical training, they do not consistently correlate with GPA. Similarly, Brazeau *et al.* (2014) found that students with lower self-confidence often compensated through increased effort, resilience, or external academic support, maintaining their academic performance (Jahrami *et al.*, 2023; Lin *et al.*, 2024). These findings suggest that confidence alone does not determine academic success but interacts with other factors such as learning strategies and institutional support.

Limitations

This study has limitations that impact the generalizability of its findings. The cross-sectional design limited our ability to make causal inferences. Additionally, the study relied on self-reported data, which may introduce response and recall biases.

CONCLUSION

This study identified Anxiety and Depression as a significant predictor of academic performance, while Social Dysfunction had a weaker association, and Loss of Confidence showed no significant impact on GPA. These findings underscore the need for integrating mental health support into medical education to enhance both academic success and student well-being. Medical schools should implement early mental health screening, targeted interventions, and resilience-focused curricula to equip students with adaptive coping strategies and stress management skills. Strengthening peer mentoring, faculty engagement, and social support networks can further mitigate the impact of distress on academic performance. Future research should explore the longitudinal effects of mental health distress and assess the effectiveness of structured interventions across diverse medical training environments to optimize student outcomes.

List of abbreviations

GPA: Grade Point Average

GHQ-12: General Health Questionnaire-12

ANOVA: Analysis of Variance

COVID-19: Coronavirus Disease 2019

KSA: Kingdom of Saudi Arabia

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Declarations

Ethics approval and consent to participate

Ethical Approval

The study received ethical approval from the Al-Rayan Colleges Ethics Committee. Informed consent was obtained from all participants, and participation was voluntary and anonymous. The work was conducted following the Declaration of Helsinki. All participants were provided with information on the study and signed consent. Students were assured that their responses would remain confidential and that their participation would not impact their academic standing.

Data Availability

Data is provided within the manuscript. The datasets used and/or analyzed during the study are available from the corresponding author on reasonable request.

Consent for Publication

Not applicable.

Conflicts of Interest

The authors declare that they have no competing interests.

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