

Assessment of the Prevalence of Anxiety and Depression Among Nursing Students in the Middle Euphrates of Iraq in Pandemic Process

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Abstract

Background: Nursing students experience substantial psychological strain during public health emergencies. However, little is known about the prevalence of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic. This study aimed to evaluate the prevalence of anxiety and depression among nursing students in this region during the pandemic and to identify the sociodemographic factors associated with them. *Methods:* A descriptive, observational study was conducted between March and June 2022 across four government universities in the Middle Euphrates region of Iraq: the University of Karbala, University of Babylon, University of Al-Qadisiyah, and University of Kufa. A sample of 812 nursing students, determined by a priori power analysis, was recruited using simple random sampling. Data were collected online using Google Forms, a Sociodemographic Characteristics Form, the State-Trait Anxiety Inventory (STAI), and the Beck Depression Inventory (BDI). As the data were not normally distributed, the Mann-Whitney U and Kruskal-Wallis tests were used to compare group differences, and Spearman's rho was used to examine correlations at a significance level of 0.05. *Results:* Most participants were female (57.9%), single (77.4%), and without children (84.0%). The mean STAI state anxiety (TX-1) score was 50.9 ± 10.1 , and the mean trait anxiety (TX-2) score was 50.2 ± 10.7 . The mean BDI score was 21.00 ± 12.00 , corresponding to moderate depression on average; 27.2% of participants had severe depression, and 31.8% had moderate depression. Anxiety scores were significantly higher among unemployed students and those with negative income, current smoking status, chronic disease, or medication use ($p < 0.05$ for all). Depression was significantly associated with education level, employment status, income, smoking status, and place of residence ($P < 0.05$). A positive correlation was found between anxiety subscales and depression scores ($p < 0.001$). *Conclusion:* Nursing students in the Middle Euphrates region of Iraq reported elevated anxiety and depression during the COVID-19 pandemic, with the highest scores concentrated among unemployed, low-income, smoking, and chronically ill students. These findings support the need for targeted psychological counseling and preventive mental health programmes for nursing students, particularly during public health crises.

Keywords: Anxiety, Depression, COVID-19 pandemic, Nursing students, Iraq

Introduction

Depression and anxiety are significant mental health conditions that can substantially affect emotional wellbeing, concentration, sleep, appetite, daily functioning, and social participation. Depression is commonly characterized by persistent sadness, guilt, and loss of interest or pleasure, whereas anxiety involves excessive fear, tension, and unease that may become difficult to control [1].

Nursing students may be particularly vulnerable to psychological distress because they must manage academic requirements while adapting to clinical environments, patient suffering, and uncertainty about professional performance. Depression among nursing students has been associated with academic-life pressures and may interfere with learning and wellbeing [2].

Evidence collected during the COVID-19 period also showed that college students experienced measurable changes in mental health and behavior, including increased symptoms of anxiety and depression and disruptions in daily routines [3].

Among nursing and other university students, psychological vulnerability during the pandemic was intensified by clinical-practice concerns, fear of infection, academic competition, and uncertainty regarding future training and employment. Longitudinal evidence has shown that anxiety and depressive symptoms remained important concerns across different phases of the pandemic [4].

The rapid spread of COVID-19 in early 2020 introduced new stressors and led universities to suspend or restrict in-person activities and adopt remote learning. These changes disrupted established social and academic routines and created additional mental health challenges for students [5].

Early pandemic research emphasized the need to examine psychological consequences among university students. Home quarantine was associated with depressive and post-traumatic stress symptoms [6], while nursing students reported anxiety related to infection risk and coping demands [7]. COVID-19-related worries, perceived vulnerability, and social isolation were also linked to traumatic stress [8], and pandemic-related stress was associated with anxiety, depression, and functional impairment [9].

The COVID-19 Pandemic and Mental Health

COVID-19 produced prolonged disruption in education, clinical training, social interaction, and everyday life. Although public-health measures were essential for limiting transmission, the resulting uncertainty and restrictions created conditions in which psychological distress could increase, particularly among young adults and students [5].

For nursing students, the pandemic combined health-related fears with uncertainty about clinical exposure, continuity of training, and personal or family safety. These overlapping pressures made the evaluation of anxiety and depression especially relevant during the emergency period [7].

Mental Health, Anxiety, and Depression: Societal and Physical Burden

Mental health is closely related to quality of life and overall functioning. Evidence indicates that people with mental illness may experience substantial reductions in health-related quality of life, with both clinical and functional characteristics contributing to this burden [10].

Most major psychiatric and substance-use disorders emerge during adolescence or early adulthood, yet young people continue to face barriers to timely and integrated mental health care. Youth-focused early intervention is therefore an important component of strategies intended to reduce long-term psychological disability [11].

The transition to adulthood also introduces academic, financial, and social pressures that can affect health behavior and emotional wellbeing. Mental and physical health are interrelated, and lifestyle factors such as sleep, smoking, diet, and physical activity are relevant to both the prevention and management of common mental disorders [12].

Nursing Education During the COVID-19 Pandemic

Anxiety and depression are not limited to emotional symptoms; they can influence sleep, health behavior,

physical functioning, and the management of chronic disease. These interactions support a broader approach to mental health that considers both psychological symptoms and overall health-related functioning [12].

Anxiety and depression frequently co-occur, and persistent symptoms may impair educational engagement, interpersonal relationships, and help-seeking. For university students, early recognition is important because untreated distress can become more difficult to manage as academic and clinical demands increase [1].

The consequences of psychological distress may extend beyond symptom severity to academic participation, social functioning, and willingness to seek professional support. Accessible, youth-appropriate services are therefore relevant to prevention and early intervention in university settings [11].

In Iraq, healthcare professionals reported substantial COVID-19-related health anxiety and high levels of preventive behavior during the pandemic [13]. Iraqi nurses were also exposed to increased anxiety, stress, and depression while providing frontline care, highlighting the importance of monitoring mental health among both current and future nursing professionals [14].

Nursing Students in the Shadow of the Pandemic

Lockdowns, physical distancing, and prolonged disruption of daily life were associated with adverse mental health outcomes and reinforced the need for prevention and early psychological intervention during public-health emergencies [15].

The psychological effects of the pandemic were not necessarily confined to its earliest phase; changes in symptoms across time and across different stages of disruption underscore the importance of studying student mental health in specific educational and regional contexts [4].

The abrupt transition to e-learning altered study routines and increased academic and technical challenges. Among university students, online learning during quarantine was associated with symptoms of depression, anxiety, and stress [16].

For nursing students, reduced social interaction, concerns about academic progress, and uncertainty surrounding clinical education could compound pre-existing stressors and contribute to worsening emotional wellbeing during the pandemic [3].

In Iraq, government-mandated physical distancing closed educational institutions and forced a rapid shift to online instruction for theoretical and practical nursing coursework. Limited internet access, shortages of electronic devices, and pandemic-related anxiety further constrained participation and learning during this transition.

Undergraduate nursing students are recognized as a population at risk of stress, anxiety, and depression, and these conditions can affect quality of life, academic performance, communication, and readiness for clinical practice. Systematic evidence supports interventions designed to reduce psychological distress in this population [17].

The Importance of the Issue in Psychiatric Nursing

Psychiatric and mental health nursing has an important role in supporting students during sudden crises, particularly by strengthening coping, resilience, and access to appropriate psychological support. Pandemic-related trauma may affect both practicing nurses and nursing students, making preventive and supportive interventions relevant to nursing education [18].

Given the frequency and educational consequences of anxiety and depression among nursing students, structured screening, early referral, and preventive mental health support should be considered within nursing education and student services [17].

Study Rationale, Aim, and Research Questions

Despite the substantial international literature on anxiety and depression among nursing students, evidence specific to nursing students in the Middle Euphrates region of Iraq remained limited, while access to psychotherapy services in the region was constrained. Understanding the prevalence of anxiety and

depression and their sociodemographic correlates can help inform nursing curricula, counseling services, and the consultative role of psychiatric and mental health nursing.

This study aimed to evaluate the prevalence of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic. It examined depression levels, anxiety levels, sociodemographic differences in anxiety and depression, and the relationship between anxiety and depression scores.

Materials and Methods

This section outlines the study objective, design, setting, sample, data collection instruments, data collection procedure, data analysis, and ethical considerations.

Objective

This study was designed to evaluate the prevalence of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic.

Study Design

The study adopted a descriptive, observational design.

Setting

This quantitative study was conducted at four government universities with nursing departments in the Middle Euphrates region of Iraq: the University of Karbala, the University of Babylon, the University of Al-Qadisiyah, and the University of Kufa. Data were collected online (Google Forms) from nursing students at these universities between March and June 2022.

Sample

The study population consisted of nursing students at the four participating universities. Participants were recruited using simple random sampling, a probability sampling method. An a priori power analysis (G*Power) indicated that, assuming a 95% confidence level and a 50% anticipated response rate, a sample of 812 would be sufficient to detect significant differences between groups (effect size $d = 0.25$, $\alpha = 0.05$, power = 0.95).

The final sample comprised 812 nursing students drawn from the University of Karbala ($n = 212$), the University of Al-Qadisiyah ($n = 150$), the University of Kufa ($n = 250$), and the University of Babylon ($n = 200$) (Figure 1). Inclusion criteria were: enrollment at one of the participating universities during the 2022–2023 academic year; age 18 years or older; willingness to participate; presence on campus during the study period (i.e., not on leave or sick leave); and absence of a mental illness that would preclude participation. Students not enrolled in nursing programs, and those who declined to participate, were excluded.

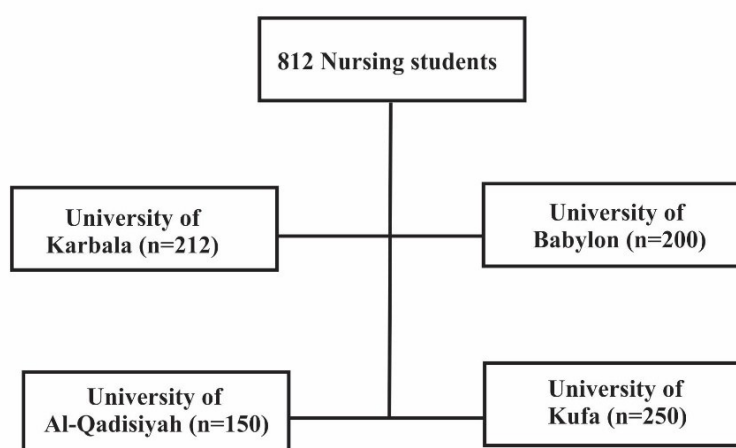


Figure 1. Sample selection across the four participating universities (N = 812).

Data Collection Instruments

Sociodemographic Characteristics Form. This researcher-developed form comprised 12 items covering age, gender, marital status, education, occupation, income, chronic disease, number of children, medication use, vaccination status, and place of residence.

State-Trait Anxiety Inventory (STAI). The STAI was developed by Spielberger et al. [19] and adapted into Arabic by Bahammam [20]. The instrument comprises 40 items divided into two 20-item subscales: state anxiety (TX-1) and trait anxiety (TX-2). Items are rated on a four-point Likert-type scale, with each subscale ranging from 20 to 80 and higher scores indicating greater anxiety. The Arabic version has shown strong internal consistency [20], and an Arabic form of the STAI has also demonstrated acceptable psychometric properties [21]. In the present study, Cronbach's alpha was 0.905 overall and 0.813 and 0.788 for TX-1 and TX-2, respectively.

Beck Depression Inventory (BDI). The BDI-II is a self-report measure developed by Beck, Steer, and Brown [22] and adapted for Arabic-speaking populations by Abdel-Khalek [23]. It contains 21 items scored from 0 to 3, yielding a total score from 0 to 63; higher scores indicate greater depressive symptom severity. In this study, scores were interpreted as minimal (0-13), mild (14-19), moderate (20-28), and severe (29-63).

Data Collection Procedure

Because universities were closed during part of the data collection period under an e-learning directive issued by the Ministry of Education and Scientific Research, data were collected online by the researcher via a Google Forms link distributed through the administration of each participating university. Verbal informed consent was obtained from all participants before they completed the survey.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS, version 26.0) at a significance level of 0.05. Frequencies, percentages, means, and standard deviations were used to summarize descriptive data. Kurtosis tests indicated that the STAI and BDI scores were not normally distributed; accordingly, the Mann-Whitney U test was used to compare two independent groups, the Kruskal-Wallis test (with post-hoc comparisons where indicated) was used to compare three or more groups, and Spearman's rho was used to examine correlations between anxiety and depression scores.

Ethical Considerations

Ethical approval for the study was obtained from the University of Karbala. Further institutional approvals were obtained from the Training and Human Development Centers at Karbala University (Approval No. 11791), the University of Babylon (Approval No. 11789), Al-Qadisiyah University (Approval No. 11790), and the University of Kufa (Approval No. 10631). Permission to use the Arabic versions of the STAI and BDI was obtained from the respective scale authors. Najaf Health Directorate reviewed and approved the study objectives and methodology prior to data collection. Verbal informed consent was obtained from all participants after they were briefed on the study's objectives, and no identifying information was collected or reported.

Result and discussion

Results

This study investigated the prevalence of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic. Findings are presented in three parts: descriptive sociodemographic characteristics, the prevalence of anxiety, and the prevalence of depression.

Table 1. Sociodemographic characteristics of participants (N = 812)

Characteristic	n	%
<i>Gender</i>		
Woman	470	57.9
Man	342	42.1
Total	812	100.0
<i>Marital status</i>		
Single	628	77.4
Married	184	22.6
Total	812	100.0
<i>Children</i>		
Yes	130	16.0
No	682	84.0
Total	812	100.0
<i>Education (degree)</i>		
Preparatory	53	6.5
Institute	374	46.1
College	385	47.4
Total	812	100.0
<i>Employment status</i>		
Employed	265	32.6
Unemployed	547	67.4
Total	812	100.0
<i>Income</i>		
Negative	283	34.9
Neutral	410	50.5
Positive	119	12.6
Total	812	100.0
<i>Smoking status</i>		
Smoker	161	19.8
Non-smoker	651	80.2
Total	812	100.0
<i>Chronic disease</i>		
Yes	96	11.8
No	716	88.2
Total	812	100.0
<i>Medication use</i>		
Yes	86	10.6
No	726	89.4

Characteristic	n	%
Total	812	100.0
<i>Vaccinated against COVID-19</i>		
Yes	601	74.0
No	211	26.0
Total	812	100.0
<i>Place of residence</i>		
City	371	45.7
Districts and sub-districts	254	31.3
Rural	187	23.0
Total	812	100.0

Note. Percentages are column percentages within each characteristic and may not total exactly 100.0% due to rounding.

As shown in Table 1, most participants were women (57.9%), single (77.4%), and without children (84.0%). Nearly half held a college degree (47.4%), and two-thirds were unemployed (67.4%). Half reported a neutral income (50.5%), and most were non-smokers (80.2%), free of chronic disease (88.2%), not taking regular medication (89.4%), vaccinated against COVID-19 (74.0%), and resident in a city (45.7%).

Table 2. Central tendency of STAI state-anxiety (TX-1) scores (N = 812)

Min	Median	Max	Mean ± SD	Mode
20	51	80	50.9 ± 10.1	51

Table 2 shows that nursing students had a mean STAI TX-1 (state-anxiety) score of 50.9 ± 10.1 (N = 812).

Table 3. Differences in STAI state-anxiety (TX-1) scores by sociodemographic characteristics

Variable	n	Mean ± SD	Statistic	p-value
Gender — Woman	470	50.6 ± 9.8	1.698	0.089
Man	342	51.3 ± 10.6		
Marital status — Single	628	50.6 ± 9.9	2.729	0.255
Married	184	49.0 ± 19.8		
Children — Yes	130	52.0 ± 11.3	0.898	0.369
No	682	50.7 ± 9.9		
Education (degree) — Preparatory	53	54.5 ± 12.5	4.492	0.106
Institute	374	51.0 ± 9.4		
College	385	50.3 ± 10.3		
Employment status — Employed	265	48.9 ± 9.7	3.938	0.000**
Unemployed	547	51.9 ± 10.2		
Income — Negative (1)	283	53.2 ± 10.6	23.212	0.000**

Variable	n	Mean $\pm$ SD	Statistic	p-value
Neutral (2)	410	49.8 $\pm$ 9.6		
Positive (3)	119	49.1 $\pm$ 9.9		
Smoking status — Smoker	161	53.0 $\pm$ 9.8	3.423	0.001**
Non-smoker	651	50.4 $\pm$ 10.2		
Chronic disease — Yes	96	53.2 $\pm$ 9.6	2.126	0.034**
No	716	50.6 $\pm$ 10.2		
Medication use — Yes	86	54.0 $\pm$ 10.0	2.859	0.004**
No	726	50.5 $\pm$ 10.1		
Vaccinated — Yes	601	50.9 $\pm$ 10.6	0.010	0.992
No	211	50.9 $\pm$ 8.7		
Place of residence — City	371	50.2 $\pm$ 10.4	2.454	0.293
Districts and sub-districts	254	51.7 $\pm$ 10.2		
Rural	187	51.2 $\pm$ 9.4		

Note. Statistic = Mann-Whitney U z-value (two-group comparisons) or Kruskal-Wallis H (three-group comparisons). * $p < 0.05$, ** $p < 0.01$.

Total STAI TX-1 scores differed significantly by employment status, with unemployed students scoring higher than employed students ($p < 0.05$). Students with negative income scored higher than those with neutral or positive income ($p < 0.05$). Smokers scored higher than non-smokers ($p < 0.05$), students with chronic disease scored higher than those without ($p < 0.05$), and students taking regular medication scored higher than those who were not ($p < 0.05$). Gender, marital status, children, education, vaccination status, and place of residence were not significantly associated with TX-1 scores.

Table 4. Central tendency of STAI trait-anxiety (TX-2) scores (N = 812)

Min	Median	Max	Mean $\pm$ SD	Mode
20	50	80	50.2 $\pm$ 10.7	51

Table 4 shows that nursing students had a mean STAI TX-2 (trait-anxiety) score of 50.2 $\pm$ 10.7.

Table 5. Differences in STAI trait-anxiety (TX-2) scores by sociodemographic characteristics

Variable	n	Mean $\pm$ SD	Statistic	p-value
Gender — Woman	470	50.3 $\pm$ 10.5	0.020	0.984
Man	342	50.1 $\pm$ 11.0		
Marital status — Single	628	50.3 $\pm$ 10.7	0.627	0.731
Married	179	50.0 $\pm$ 10.7		
Children — Yes	130	50.3 $\pm$ 10.5	0.570	0.569
No	682	50.2 $\pm$ 12.0		
Education (degree) — Preparatory	53	52.4 $\pm$ 13.6	1.657	0.437
Institute	374	50.3 $\pm$ 10.0		

Variable	n	Mean ± SD	Statistic	p-value
College	385	49.9 ± 10.9		
Employment status — Employed	265	48.2 ± 10.3	4.101	0.000**
Unemployed	547	51.2 ± 10.8		
Income — Negative (1)	283	53.2 ± 11.2	30.634	0.000**
Neutral (2)	410	49.0 ± 10.2		
Positive (3)	119	47.6 ± 9.8		
Smoking status — Smoker	161	51.5 ± 10.7	2.221	0.026**
Non-smoker	651	49.9 ± 10.7		
Chronic disease — Yes	96	52.3 ± 10.2	2.299	0.022**
No	716	50.0 ± 10.7		
Medication use — Yes	86	53.3 ± 11.3	2.588	0.010**
No	726	49.9 ± 10.6		
Vaccinated — Yes	601	50.4 ± 11.2	0.304	0.761
No	211	49.8 ± 9.3		
Place of residence — City	371	49.8 ± 11.3	1.740	0.419
Districts and sub-districts	254	50.9 ± 10.6		
Rural	187	50.1 ± 9.7		

Note. Statistic = Mann-Whitney U z-value (two-group comparisons) or Kruskal-Wallis H (three-group comparisons). * $p < 0.05$, ** $p < 0.01$.

As with TX-1, total STAI TX-2 scores were significantly higher among unemployed students than employed students ($p < 0.05$), among students with negative income than those with neutral or positive income ($p < 0.05$), among smokers than non-smokers ($p < 0.05$), among students with chronic disease than those without ($p < 0.05$), and among students taking regular medication than those who were not ($p < 0.05$). Gender, marital status, children, education, vaccination status, and place of residence were not significantly associated with TX-2 scores.

Table 6. Central tendency of Beck Depression Inventory (BDI) scores (N = 812)

Min	Median	Max	Mean ± SD	Mode
0	20	63	21.00 ± 12.00	16

Table 6 shows that nursing students had a mean BDI score of 21.00 ± 12.00 , corresponding to the moderate depression range.

Table 7. Differences in moderate-to-severe depression ($BDI \geq 20$) by sociodemographic characteristics

Variable	Moderate/severe		Minimal/mild		Total	
	n	%	n	%	n	%
<i>Gender</i>						
Woman	275	58.5	195	41.5	470	100.0
Man	204	59.6	138	40.4	342	100.0

Variable	Moderate/severe		Minimal/mild		Total	
	n	%	n	%	n	%
Total	479	59.0	333	41.0	812	100.0
$z = 1.428, p = 0.153$						
<i>Marital status</i>						
Single	373	59.4	255	40.6	628	100.0
Married	104	58.1	75	41.9	179	100.0
Widowed	1	25.0	3	75.0	4	100.0
Total	478	58.9	333	41.1	811	100.0
$\chi^2 = 1.969, p = 0.374$						
<i>Children</i>						
Yes	70	53.8	60	46.2	130	100.0
No	409	60.0	273	40.0	682	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 1.913, p = 0.056$						
<i>Education (degree)</i>						
Preparatory	30	56.6	23	43.4	53	100.0
Institute	238	63.6	136	36.4	374	100.0
College	211	54.8	174	45.2	385	100.0
Total	479	59.0	333	41.0	812	100.0
$\chi^2 = 11.378, p = 0.003^{**}$						
<i>Employment status</i>						
Employed	127	47.9	138	52.1	265	100.0
Unemployed	352	64.4	195	35.6	547	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 5.083, p = 0.000^{**}$						
<i>Income</i>						
Negative	185	65.4	98	34.6	283	100.0
Neutral	237	57.8	173	42.2	410	100.0
Positive	57	47.9	62	52.1	119	100.0
Total	479	59.0	333	41.0	812	100.0
$\chi^2 = 16.542, p = 0.000^{**}$						
<i>Smoking status</i>						
Smoker	102	63.4	59	36.6	161	100.0
Non-smoker	377	57.9	274	42.1	651	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 2.561, p = 0.010^{**}$						
<i>Chronic disease</i>						
Yes	71	74.0	25	26.0	96	100.0

Variable	Moderate/severe		Minimal/mild		Total	
	n	%	n	%	n	%
No	408	57.0	308	43.0	716	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 1.761, p = 0.078$						
<i>Medication use</i>						
Yes	61	70.9	25	29.1	86	100.0
No	418	57.6	308	42.4	726	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 1.592, p = 0.111$						
<i>Vaccinated</i>						
Yes	351	58.4	250	41.6	601	100.0
No	128	60.7	83	39.3	211	100.0
Total	479	59.0	333	41.0	812	100.0
$z = 0.350, p = 0.726$						
<i>Place of residence</i>						
City	200	53.9	171	46.1	371	100.0
Districts and sub-districts	168	66.1	86	33.9	254	100.0
Rural	111	59.4	76	40.6	187	100.0
Total	479	59.0	333	41.0	812	100.0
$\chi^2 = 13.371, p = 0.001^{**}$						

Note. "Moderate/severe" = $BDI \geq 20$; "Minimal/mild" = $BDI < 20$. Statistic = Mann-Whitney U z-value (two-group comparisons) or Kruskal-Wallis χ^2 (three-group comparisons). $^{**}p < 0.05$.

Gender, marital status, having children, chronic disease, medication use, and vaccination status were not significantly associated with BDI scores ($p > 0.05$ for all). In contrast, education level ($\chi^2 = 11.378, p = 0.003$), employment status ($z = 5.083, p < 0.001$), income ($\chi^2 = 16.542, p < 0.001$), smoking status ($z = 2.561, p = 0.010$), and place of residence ($\chi^2 = 13.371, p = 0.001$) were all significantly associated with BDI scores.

Table 8. Frequency distribution of BDI depression severity categories (N = 812)

	Minimal (0–13)	Mild (14–19)	Moderate (20–28)	Severe (29–63)
n	164	169	258	221
%	20.2	20.8	31.8	27.2

More than a quarter of participants had severe depression ($n = 221, 27.2\%$) and nearly one-third had moderate depression ($n = 258, 31.8\%$); the remainder had either mild ($n = 169, 20.8\%$) or minimal ($n = 164, 20.2\%$) depression (Table 8, Figure 2).

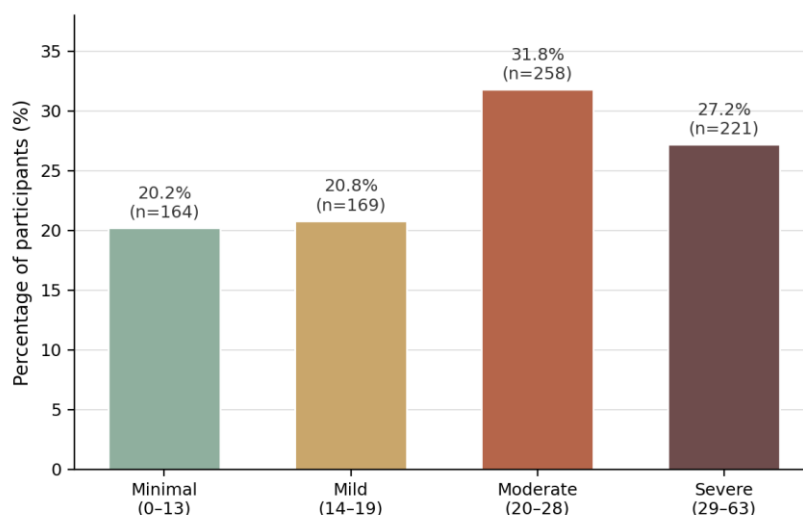


Figure 2. Distribution of depression severity among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic (N = 812).

Table 9. Spearman correlations among STAI and BDI scores

Scale	1	2	3
1. STAI TX-1 (state anxiety)	—		
2. STAI TX-2 (trait anxiety)	0.804**	—	
3. BDI (depression)	0.635**	0.679**	—

* $p < 0.05$, ** $p < 0.001$.

Spearman's rho showed a strong positive correlation between the two STAI subscales ($r = 0.804$, $p < 0.001$), a moderate positive correlation between TX-1 and BDI scores ($r = 0.635$, $p < 0.001$), and a moderate-to-strong positive correlation between TX-2 and BDI scores ($r = 0.679$, $p < 0.001$), indicating that higher anxiety was consistently associated with higher depression scores.

Discussion

This study examined the prevalence of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic. The findings indicate a substantial psychological burden in this population and identify socioeconomic and health-related characteristics associated with higher anxiety and depression scores.

Participants had a mean age of 22.3 ± 4.3 years. Variation in the age profile of nursing-student samples across settings is expected because nursing education systems differ in entry pathways, program duration, and opportunities for employment during study.

Most participants were women, single, and without children. This profile is consistent with the demographic composition commonly observed in nursing education and is important when interpreting the generalizability of the findings to other student populations.

A positive correlation was found between depression and both state and trait anxiety, indicating that students with higher anxiety also tended to report higher depressive symptoms. Similar co-occurrence of anxiety and depression has been reported in populations exposed to pandemic-related socioeconomic stress and in broader assessments of COVID-19 mental health effects [24], [25].

Anxiety was significantly higher among unemployed students than employed students. Economic insecurity and uncertainty about future employment may intensify psychological distress among students, and pandemic-period studies of nursing students have likewise identified substantial perceived stress in the

context of disrupted education and restricted opportunities [26].

Students with negative income reported higher state and trait anxiety than those with neutral or positive income. This pattern is consistent with evidence that financial instability and concerns about the economic consequences of the pandemic were associated with greater psychological distress among university students [27].

Smokers reported higher state and trait anxiety than non-smokers. Anxiety sensitivity and smoking behavior are closely related, and nicotine dependence may interact with stress, sleep disruption, and health-related concerns in ways that contribute to greater anxiety [28].

Participants with chronic disease reported higher anxiety than those without chronic disease, and students taking regular medication also had higher anxiety. During the pandemic, underlying illness was associated with greater concern about health consequences and heightened anxiety, which may help explain the increased vulnerability observed in this group [29].

Depressive symptoms were common: 20.8% of participants had mild depression, 31.8% had moderate depression, and 27.2% had severe depression. Studies of nursing students during COVID-19 quarantine and lockdown periods similarly documented clinically relevant anxiety and depression across different countries [30], [31], while evidence from Japan also showed substantial depression and anxiety among nursing students during the pandemic [32].

Depression was higher among students with negative income, reinforcing the importance of economic stress as a potential contributor to psychological burden. This result is consistent with evidence showing that lower-income groups experienced pronounced anxiety and depression during COVID-19 restrictions [24], [25].

Depression also differed by education level, employment status, smoking status, and place of residence. These findings suggest that psychological distress among nursing students reflects the combined influence of academic, socioeconomic, behavioral, and contextual factors rather than a single determinant. More recent evidence further indicates that anxiety and depression can interact with academic burnout and self-efficacy among nursing undergraduates [33].

Limitations

This study has several limitations. Data were collected online via self-report questionnaires, which may be subject to social desirability and recall bias. The cross-sectional design precludes causal inference regarding the associations observed. Because the sample was drawn from four government universities in the Middle Euphrates region of Iraq, findings may not generalize to nursing students in other regions of Iraq or in other countries. Finally, data collection coincided with a period of partial university closures and reliance on remote instruction, which may itself have influenced reported anxiety and depression levels.

Conclusion

This study found a substantial burden of anxiety and depression among nursing students in the Middle Euphrates region of Iraq during the COVID-19 pandemic, with mean state- and trait-anxiety scores of 50.9 ± 10.1 and 50.2 ± 10.7 , respectively, and 59.0% of participants falling within the moderate-to-severe depression categories. Higher anxiety was concentrated among unemployed students, those with negative income, smokers, and students with chronic disease or regular medication use, while depression was significantly associated with education level, employment status, income, smoking status, and place of residence; anxiety and depression were also positively correlated. These findings support integrating routine mental health screening, accessible counseling, targeted support for financially vulnerable students and those with chronic health risks, resilience and social-support activities, and clear health education into nursing-student services, particularly during public-health crises. Future multicenter and longitudinal studies across Iraq should evaluate culturally appropriate assessment tools and clarify the temporal and causal relationships between socioeconomic conditions, health factors, anxiety, and depression.

Declarations

Ethics approval and consent to participate. The study was approved by the University of Karbala, with further institutional approvals granted by the Training and Human Development Centers at Karbala University (Approval No. 11791), the University of Babylon (Approval No. 11789), Al-Qadisiyah University (Approval No. 11790), and the University of Kufa (Approval No. 10631). Permission to use the Arabic versions of the STAI and BDI was obtained from the respective scale authors. Verbal informed consent was obtained from all participants prior to data collection.

Consent for publication. Not applicable, this manuscript does not contain any individual person's identifying data.

Competing interests. The authors declare that they have no competing interests.

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Authors' contributions. K.A.K.A. conceived and designed the study, collected and analyzed the data, and drafted the manuscript. S.D. supervised the study and critically reviewed the manuscript. A.H.A. co-supervised the study and critically reviewed the manuscript. All authors read and approved the final manuscript.

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