

Assessment of Depression and Anxiety Among Public Health Students: A Cross-Sectional Study in University of Hail, Saudi Arabia

Rakesh Kumar*

Department of Health Management, College of Public Health and Health Informatics, University of Hail, Hail, Saudi Arabia.

*Correspondence to: Rakesh Kumar (E-mail: ra.kumar@uoh.edu.sa)

(Submitted: 14 April 2024 – Revised version received: 30 April 2024 – Accepted: 20 May 2024 – Published online: 26 June 2024)

Abstract

Objective: The study aims to identify the socio-demographic and lifestyle factors associated with depression, and anxiety among public health students at the University of Hail in Saudi Arabia.

Methods: The researchers collected responses from 446 participants using a convenience sampling approach through a cross-sectional quantitative research design. The collected data underwent analysis through descriptive statistics, focusing on socio-demographic and lifestyle factors. Additionally, the measure of association is used to verify the associations of these factors with depression and anxiety among public health students of the University of Hail in Saudi Arabia. Finally, the binary logistic regression is used to identify the impacts of various socio-demographic, and lifestyle factors on mild to severe anxiety and depression of these students.

Results: The research proves that lower family income and bad relationships with classmates are significant demographic factors, while unsatisfied sleep, smoking habits, and symptoms ranging from mild to severe depression are lifestyle factors that contribute to heightened anxiety among public health students at the University of Hail in Saudi Arabia. Additionally, it was also found that transitional age (21–25 years) from socio-demographic factors, unsatisfied sleep level, smoking habit, and mild to severe symptoms of anxiety also cause significant increased depression among these students.

Conclusion: The study concludes that students who are not satisfied with their sleep, and have a smoking status are more exposed to anxiety as well as depression as compared to non-smokers, and the students with satisfied sleep. Additionally, those students who are not good in relationships with their classmates, and have mild to severe symptoms of depression are exposed to anxiety significantly. Finally, those students having a transitional age of 21–25 years along with mild to severe symptoms of anxiety are significantly exposed to depression.

Keywords: depression, anxiety, public health students, cross-sectional study, Saudi Arabia

Introduction

A transitional period for a student starts after being admitted to a university. Several crucial changes in their socio-demographic, and lifestyle may require diverse skillsets to face new challenges and deal with them successfully during this transitional period. During this phase, university students often form new emotional connections question their chosen career paths, seek greater problem-solving autonomy, encounter heightened knowledge requirements, and take on more intricate responsibilities.¹ As a result, challenges can emerge at different levels: organizational (like managing multiple tasks and unfamiliarity with teaching and assessment techniques); interpersonal or social (such as adapting to new relationships with educators and peers and the necessity for fresh social support systems); and personal (like the absence of familial backing and socioeconomic challenges).² These challenges can often lead to elevated or persistent stress levels, compromising the well-being, adjustment, and academic involvement of university students.³ Moreover, research indicates that 75% of mental health disorders emerge before the age of 24, highlighting the increased susceptibility of university students.⁴ Research has indicated a troubling prevalence of mental health issues among university students, including high rate of depression and anxiety.⁵⁻⁸ Mental well-being has been linked positively to high socioeconomic status, consistent emotional relationships, academic success, and improved sleep patterns.⁹ Various factors have been identified that can impact student's mental health, such as moving away from family, academic grades, prior mental health.¹⁰⁻¹² or inadequate sleep.¹³⁻¹⁵

There are some factors from demographics, and lifestyles, that can develop depression and anxiety. For example, higher academic levels, bad quality of life, and dropout rates adversely affect academic progress and cause depression and anxiety.¹⁶⁻¹⁹ Research suggests that the transition to university can induce psychological strain, even among those without pre-existing mental health issues.^{20,21} Therefore, the mental health of university students has emerged as a growing public health issue.²² Among the referenced studies, there is a noticeable gap in research conducted in Saudi Arabia, with the majority of studies being carried out in countries outside the Middle East. Hence, it is crucial to determine if the findings align with or diverge from those in Saudi Arabia to devise effective intervention strategies.

This study aims to identify early signs of anxiety and depression in public health students at the University of Hail in Saudi Arabia (by exploring associated factors) and lays the groundwork for developing mental health promotion initiatives for them. It could also inform university administrative decisions based on the current mental health status of the students. In light of the above, this study seeks to evaluate the prevalence of depressive and anxiety symptoms among students at the University of Hail in Saudi Arabia and investigate the factors linked to these symptoms. To address these aims, the following research questions are formulated:

1. What is the prevalence of depression, and anxiety symptoms among Public Health students at the University of Hail in Saudi Arabia?

2. Which factors from socio-demographics, and lifestyle are associated with depression, and anxiety among the target population?

Materials & Methods

The study followed a quantitative research design, using cross-sectional survey data from the University of Hail in Saudi Arabia. The population under investigation comprises undergraduate public health students at the University. Participants were selected using a non-probability-based convenience sampling approach. The sample includes the public health students available, and willing to participate in the study during the data collection period (January-March, 2024). A total of 500 survey questionnaires were distributed among the participants. However, only 446 valid responses were received, indicating an 89% response rate.

The researcher used a cross-sectional questionnaire survey for data collection. It consists of three sections; demographic information, lifestyle information, and questions related to depression and anxiety. The demographic information section includes eight questions related to gender, age, academic level, relationship status, monthly household income, living status, and relationship with classmates. Similarly, the lifestyle information includes questions related to regular physical activities, sleeping hours/status, sleep satisfaction, smoking status, and internet usage. Finally, the third section includes the seven questions related to depression and nine questions related to anxiety.

The dependent variables of the study are depression and anxiety while the independent variables are socio-demographic, and lifestyle factors. The researcher used a 9-item version of the Patient Health Questionnaire (PHQ-9) to assess the symptoms of depression, adapted for use in the Saudi Arabia from Alreshidi.²³ Additionally, the researcher used 7-items for generalised anxiety disorder (GAD-7) for assessing the symptoms of anxiety as per the Saudi Arabia adopted from Alghadir, Manzar.²⁴ These questions were assessed using a 4-point type Likert scale (not at all, to nearly every day). The severity of depression or anxiety symptoms were classified into no, mild, moderate, and severe symptoms. The seven-item scale (GAD-7) was estimated to be reliable and valid (inter-item correlation = 0.396, and Cronbach alpha = 0.821). Similarly, the 9-item scale (PHQ-9) was also estimated to be reliable and valid (inter-item correlation = 0.366, and Cronbach alpha = 0.838).

The researcher analysed the data using SPSS 27. The analysis includes the descriptive analysis, measure of association, and logistic regression analysis. The descriptive analysis includes the summary of socio-economic and lifestyle factors. The measure of association estimates the significance of association between factors, and outcomes of this study. Finally, the logistic regression includes the binary logistic regression for testing the hypotheses of the study.

Results

The researcher analysed data using descriptive statistics, measures of association, and binary logistic regression. The results of descriptive statistics and measures of associations are indicated in Table 1. The results of binary logistic regression are shown in Tables 2 and 3.

Table 1 shows the demographic and lifestyle details in terms of respondent frequency, and percentage for a particular characteristic; general, depression, and anxiety. The table reports that there were 296 (66.4%) male, and 150 (33.6%) female public health students from the University of Hail from Saudi Arabia participated in this study. Among these participants, (186 males + 84 females) 270 (61%) participants had positive (mild to severe) symptoms of Anxiety. This percentage of Anxiety is slightly higher than similar surveys conducted in developed economies.^{5-7,15} Similarly, 286 participants (64%) which included 202 males, and 84 females had positive (mild to severe) symptoms of depression. This percentage of depression is slightly lower than similar surveys conducted in developed economies.^{5,7,18} Table 1 also indicates the further socio-demographic factors summary of the study participants including the depression, and anxiety percentages.

Table 2 reports the binary logistic regression results of factors associated with anxiety for 446 public health students of the University of Hail from Saudi Arabia who participated in this study.

The model was statistically fit ($P < 0.01$). The Nagelkerke R^2 value is 0.337 which indicates that 33.7% variation in anxiety is explained by the variation in depression, socio-demographic factors, and lifestyle factors.

According to the binary logistic estimations, anxiety among these participants is significantly associated with higher income, bad relationships with classmates, unsatisfactory sleep levels, smoking habits, and moderate to higher depression levels. The participants with higher household income were 0.295 times less likely to experience anxiety than those with less household income (Exp (β) = 0.295, CI = 0.127–0.689, $P < 0.001$). Similarly, the participants having bad relationships were 2.687 times more likely to experience anxiety than those with good relationships with their classmates (Exp (β) = 2.687, CI = 1.487–4.856, $P < 0.001$). Moreover, the participants having unsatisfied sleep were 1.731 times more likely to experience anxiety than those with satisfied sleep (Exp (β) = 1.731, CI = 0.914–3.28, $P < 0.001$). The table further reports that the participants having smoking habit were 2.277 times more likely to experience anxiety than those with no smoking habit (Exp (β) = 2.277, CI = 0.979–5.299, $P < 0.001$). Finally, the participants having mild to severe depression (positive) were 5.318 times more likely to experience anxiety than those with no depression (Exp (β) = 5.318, CI = 3.31–8.545, $P < 0.001$).

Table 3 shows the results of binary logistic regression of factors that impact depression for the participants of this study. The model was statistically fit ($P < 0.01$). The Nagelkerke R^2 value is 0.348 which indicates that 34.8% variation in depression is explained by the variation in anxiety, socio-demographic factors, and lifestyle factors.

According to the binary logistic estimations, depression among these participants is significantly associated with the 21–25 years age category, unsatisfactory sleep level, smoking habit, and moderate to higher anxiety. The students with transitional age (21–25 years) were 1.937 times more likely to experience depression than those with younger, or older than this age category (Exp (β) = 1.937, CI = 1.024–3.663, $P < 0.05$). Additionally, the participants having unsatisfied sleep were 2.02 times more likely to experience depression verses those with satisfied sleep (Exp (β) = 2.02, CI = 1.019–4.003, $P < 0.05$). Furthermore, the participants with less than 7–8 hours' sleep were 2.70 times more likely to experience depression verses

Table 1. Socio-demographic, and lifestyle summary

Variables	Category	N	%	Anxiety				P-value	Depression				P-value
				Negative		Positive			Negative		Positive		
				N	%	N	%		N	%	N	%	
Gender	Male	296	66.4	110	62.5	186	68.9	0.183	94	58.8	202	70.6	0.12
	Female	150	33.6	66	37.5	84	31.1		66	41.3	84	29.4	
Age (Years)	< 20	103	23.1	61	34.7	42	15.6	0.000	62	38.8	41	14.3	0.000
	21–25	173	38.8	64	36.4	109	40.4		58	36.3	115	40.2	
	25	170	38.1	51	29.0	119	44.1		40	25.0	130	45.5	
Relationship status	Single	374	83.9	154	87.5	220	81.5	0.114	135	84.4	239	83.6	0.824
	Married	72	16.1	22	12.5	50	18.5		25	15.6	47	16.4	
Household monthly income (Riyals)	1000–5000	49	11.0	13	7.4	36	13.3	0.023	18	11.3	31	10.8	0.911
	5001–10,000	118	26.5	57	32.4	61	22.6		44	27.5	74	25.9	
	10,000	279	62.6	106	60.2	173	64.1		98	61.3	181	63.3	
Living status	With Family	381	85.4	159	90.3	222	82.2	0.019	148	92.5	233	81.5	0.002
	Away from Family	65	14.6	17	9.7	48	17.8		12	7.5	53	18.5	
Relationship with classmates	Good	344	77.1	155	88.1	189	70.0	0.000	138	86.3	206	72.0	0.000
	Bad	102	22.9	21	11.9	81	30.0		22	13.8	80	28.0	
Regular physical activities	Yes	256	57.4	104	59.1	152	56.3	0.560	94	58.8	162	56.6	0.666
	No	190	42.6	72	40.9	118	43.7		66	41.3	124	43.4	
Sleeping satisfaction	Satisfied	366	82.1	155	88.1	211	78.1	0.008	143	89.4	223	78.0	0.003
	Unsatisfied	80	17.9	21	11.9	59	21.9		17	10.6	63	22.0	
Sleeping status (Hours)	< 7–8	206	46.2	79	44.9	127	47.0	0.029	65	40.6	141	49.3	0.011
	7–8	197	44.2	72	40.9	125	46.3		71	44.4	126	44.1	
	> 7–8	43	9.6	25	14.2	18	6.7		24	15.0	19	6.6	
Smoking status	Yes	59	13.2	10	5.7	49	18.1	0.000	8	5.0	51	17.8	0.000
	No	387	86.8	166	94.3	221	81.9		152	95.0	235	82.2	
Internet usage	Yes	446	100.0	176	100.0	270	100.0	–	160	100.0	286	100.0	–
	No	0	0	0	0	0	0		0	0	0	0	

those with more hours of sleep (Exp (β) = 2.702, CI = 1.196–6.101, $P < 0.05$). Moreover, participants with smoking habit were 2.318 times more likely to experience depression verses with no smoking habit (Exp (β) = 2.318, CI = 0.925–5.814, $P < 0.10$). Finally, the participants with mild to severe anxiety were 5.429 times more likely to experience depression verses those with no anxiety (Exp (β) = 5.429, CI = 3.375–8.732, $P < 0.001$).

Discussion

This study examined the factors associated with depression and anxiety in the public health students of University of Hail in Saudi Arabia. To achieve this objective, survey-based cross-sectional data were collected from 446 target respondents using convenience sampling between January and March 2024. Many questions on socio-demographics, lifestyles, depression, and anxiety were asked from these respondents as a part of the self-administrative survey questionnaire. The collected data was then analysed using SPSS 27. The analysis includes descriptive statistics, measures of association, and binary logistic regression results. The finding revealed

socio-demographic and lifestyle factors that impact the depression, and anxiety of public health students in the University of Hail, Saudi Arabia.

The study found that mild to severe anxiety among the public health students of the University of Hail in Saudi Arabia is significantly and negatively associated with higher levels of household income. It indicates that an increase in monthly family income can significantly decrease anxiety among the target population. This finding is consistent with previous studies,^{5,23,25} and several reasons can account for it. Firstly, the higher income provides financial security, and stability which reduces stress relating to meeting basic needs and allows students to focus more on their studies. Secondly, the increased income offers enhanced social and recreational opportunities, fostering social support and stress relief. Lastly, a higher income can boost students' sense of control, self-efficacy, and psychological well-being.

The study also found a positive impact of a bad relationship with mild to severe anxiety among the public health students of the University of Hail in Saudi Arabia. It indicates that an increase in bad relationships with classmates can

Table 2. **Logistic Regression for the factors associated with anxiety**

Variables	Coefficient	S.E.	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Gender (Ref: Female)						
Male	-0.334	0.276	0.227	0.716	0.417	1.231
Age (Ref: < 20 Years)						
21–25 Years	0.437	0.328	0.182	1.548	0.815	2.941
> 25 Years	0.527	0.517	0.308	1.694	0.615	4.667
Relationship status (Ref: Single)						
Married	0.338	0.33	0.306	1.402	0.734	2.68
Household Income (Ref: 1. 1000–5000 Riyals)						
5001–10,000 Riyals	-0.746	0.394	0.058	0.474	0.219	1.026
> 10,000 Riyals	-1.22	0.432	0.005	0.295	0.127	0.689
Living Status (Ref: With Family)						
Away from Family	0.287	0.367	0.434	1.332	0.649	2.733
Relationship with Classmates (Ref: Good)						
Bad	0.988	0.302	0.001	2.687	1.487	4.856
Regular Physical Activity (Ref: Yes)						
No	0.167	0.243	0.491	1.182	0.735	1.903
Sleep Satisfaction (Ref: Satisfied)						
Unsatisfied	0.549	0.226	0.032	1.731	0.914	3.28
Sleeping Status (Ref: > 7–8 Hours)						
< 7–8 Hours	0.609	0.411	0.138	1.839	0.822	4.114
7–8 Hours	0.918	0.413	0.026	2.504	1.115	5.623
Smoking Status (Ref: No)						
Yes	0.823	0.431	0.046	2.277	0.979	5.299
Depression (Ref: Negative)						
Positive	1.671	0.242	0.000	5.318	3.31	8.545
Constant	-1.17	0.589	0.047	0.31		

significantly enhance the anxiety level among these students. The positive impact of bad relationships with classmates on the anxiety symptoms of university students is consistent with previous studies.^{4,7,8} This finding can be attributed to many reasons. Firstly, a lack of social support and a sense of belonging resulting from strained relationships can lead to feelings of isolation and loneliness, thereby exacerbating anxiety. Secondly, the negative impact on academic collaboration and performance can increase academic stress and anxiety about grades. Additionally, poor relationships with classmates can contribute to negative self-perception, self-esteem issues, and fear of rejection, which in turn can lead heightened anxiety in social situations.

Moreover, the study found a positive impact of age categories 21–25 on mild to severe depression among public health students of the University of Hail in Saudi Arabia. It indicates that the students under this age category are more likely to have depression symptoms. The positive impact of this age category is consistent with previous studies.²⁰ The positive impact of this age category is attributed to the

transitional life stage characterised by academic pressures, personal, and social challenges, and the lack of effective coping mechanisms. This age group often faces significant life transitions, undergoes identity formation, and experiences social and peer pressures, and may engage in unhealthy lifestyle choices, all of which contribute to increased vulnerability to depression.

Additionally, the analysis revealed a positive and significant impact of unsatisfactory sleep levels in enhancing the anxiety and depression among public health students of the University of Hail in Saudi Arabia. It indicates that increasing the level of satisfaction towards sleep can result in increasing anxiety and depression among these students. This positive result is consistent with previous studies.^{5,7,15,25} This finding is attributed to inadequate sleep that disrupts the natural sleep-wake cycle and circadian rhythms, leading to impaired cognitive function and emotional regulation, which exacerbates anxiety and depressive feelings.

Furthermore, the study found a positive impact of having a smoking status on anxiety and depression among the public

Table 3. Logistic regression for the factors associated with depression

Variables	Coefficients	S.E.	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Gender (Ref: Female)						
Male	0.251	0.28	0.362	1.285	0.749	2.203
Age (Ref: < 20 Years)						
21–25 Years	0.661	0.33	0.042	1.937	1.024	3.663
> 25 Years	0.56	0.53	0.285	1.751	0.626	4.897
Relationship status (Ref: Single)						
Married	−0.54	0.33	0.101	0.581	0.303	1.111
Household Income (Ref: 1. 1000–5000 Riyals)						
5001–10,000 Riyals	0.492	0.43	0.253	1.635	0.704	3.796
> 10,000 Riyals	0.268	0.38	0.481	1.308	0.62	2.758
Living Status (Ref: With Family)						
Away from Family	0.601	0.41	0.142	1.824	0.818	4.066
Relationship with Classmates (Ref: Good)						
Bad	0.459	0.31	0.135	1.582	0.867	2.887
Regular Physical Activity (Ref: Yes)						
No	0.036	0.25	0.886	1.037	0.634	1.695
Sleep Satisfaction (Ref: Satisfied)						
Unsatisfied	0.703	0.35	0.044	2.02	1.019	4.003
Sleeping Status (Ref: > 7–8 Hours)						
< 7–8 Hours	0.994	0.42	0.017	2.702	1.196	6.101
7–8 Hours	0.816	0.42	0.05	2.261	0.998	5.12
Smoking Status (Ref: No)						
Yes	0.841	0.47	0.073	2.318	0.925	5.814
Anxiety (Ref: Negative)						
Positive	1.692	0.24	0.000	5.429	3.375	8.732
Constant	−2.56	0.62	0.000	0.077		

health students of the University of Hail in Saudi Arabia. It indicates that having a smoking status can significantly cause anxiety and depression among these students. This result is consistent with previous studies.^{6,25} This finding is attributed to some reasons like smoking leading to nicotine dependence and withdrawal symptoms, disrupting the balance of neurotransmitters in the brain and exacerbating anxiety and depression. Furthermore, using smoking as a coping mechanism, negative self-perception, and social isolation due to smoking habits, exposure to second-hand smoke, and concerns about poor physical health contribute to increased mental health issues.

Finally, the researcher found that a mild to severe anxiety positively contributes towards increasing depression. Additionally, it was also found that a mild to severe depression also contribute towards increasing the anxiety level. It indicates a two way causal relationship between anxiety and depression among the public health students of University of Hail in Saudi Arabia. This result is consistent with a number of studies.^{5-7,15,25} This two way causal relationship attributed to a vicious cycle of interconnected psychological factors, including cognitive distortions and low self-esteem, as well as physiological responses

such as imbalances in stress hormones and neurotransmitters. Additionally, social isolation and environmental stressors in the university setting contribute to the development and exacerbation of both conditions. Therefore, the policymakers are required to identify, intervene, and treat in advance if these anxiety, or depression symptoms are found in order to break this vicious cycle, and improve the wellbeing, and mental health of university students.

Conclusion

The analysis revealed that lower family income, bad relationships with classmates, unsatisfied sleep, smoking status, and depression significantly cause anxiety among the public health students of the University of Hail in Saudi Arabia. Additionally, transition age category of 21–25 years, unsatisfied sleep, smoking, and anxiety significantly cause depression among these students.

The results of this study provide some useful practical implications for university students in Saudi Arabia in general, and public health students of the University of Hail in particular. Strategies should focus on improving family financial

support, fostering positive relationships among classmates, promoting healthy sleep habits, and addressing smoking cessation. Additionally, interventions should be tailored to support students aged 21–25, emphasising anxiety management to prevent the onset of exacerbation of depression. Implementing these targeted interventions can enhance student well-being and academic success.

Some of the limitations of this study are the cross-sectional design that hinders the establishment of any causal relationship between the identified factors and anxiety and depression. Additionally, the reliance on self-reported survey data may introduce response bias. Further, the specificity of the samples to the public health students at the University of Hail, Saudi Arabia limits generalizability. There can be other variables like academic pressure and cultural influences that can have a significant impact on the results of the research which are not measured here. Future research should consider employing longitudinal and qualitative methods to explore causal relationships and deeper insights. Including diverse student's populations and comprehensive assessments of potential confounding variables can enhance the understanding and support strategies for promoting mental health among university students in Saudi Arabia.

Ethical Considerations

Ethical approval was obtained from the University of Ha'il Research Ethics Committee (Number: H-2024-153) in Saudi Arabia.

Informed Consent

Informed consent was obtained from all subjects involved in the study.

Acknowledgment

We thank all who participated in this study.

Conflicts of Interest

None.

Grant Support & Financial Disclosure

This research has no funding. ■

References

- Akour M, Alenezi M. Higher Education Future in the Era of Digital Transformation. *Education Sciences* [Internet]. 2022; 12(11).
- Salanova M, Schaufeli W, Martínez I, Bresó E. How obstacles and facilitators predict academic performance: the mediating role of study burnout and engagement. *Anxiety, Stress, & Coping*. 2010;23(1):53–70.
- Durand-Bush N, McNeill K, Harding M, Dobransky J. Investigating Stress, Psychological Well-Being, Mental Health Functioning, and Self-Regulation Capacity Among University Undergraduate Students: Is This Population Optimally Functioning? *Canadian Journal of Counselling and Psychotherapy*. 2015;49(3).
- Sheldon E, Simmonds-Buckley M, Bone C, Mascarenhas T, Chan N, Wincott M, et al. Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *Journal of Affective Disorders*. 2021;287:282–92.
- Asif S, Mudassar A, Shahzad TZ, Raouf M, Pervaiz T. Frequency of depression, anxiety and stress among university students. *Pakistan Journal of medical sciences*. 2020;36(5):971–6.
- Wörfel F, Gusy B, Lohmann K, Töpritz K, Kleiber D. Mental health problems among university students and the impact of structural conditions. *Journal of Public Health*. 2016;24(2):125–33.
- Ramón-Arбуés E, Gea-Caballero V, Granada-López JM, Juárez-Vela R, Pellicer-García B, Antón-Solanas I. The Prevalence of Depression, Anxiety and Stress and Their Associated Factors in College Students. *International Journal of Environmental Research and Public Health* [Internet]. 2020; 17(19).
- Kang Harmeet K, Rhodes C, Rivers E, Thornton Clifton P, Rodney T. Prevalence of Mental Health Disorders Among Undergraduate University Students in the United States: A Review. *Journal of Psychosocial Nursing and Mental Health Services*. 2021;59(2):17–24.
- Navarro-Carrillo G, Alonso-Ferres M, Moya M, Valor-Segura I. Socioeconomic Status and Psychological Well-Being: Revisiting the Role of Subjective Socioeconomic Status. *Frontiers in Psychology*. 2020;11.
- Pedrelli P, Nyer M, Yeung A, Zulauf C, Wilens T. College Students: Mental Health Problems and Treatment Considerations. *Academic Psychiatry*. 2015;39(5):503–11.
- Bruffaerts R, Mortier P, Kiekens G, Auerbach RP, Cuijpers P, Demyttenaere K, et al. Mental health problems in college freshmen: Prevalence and academic functioning. *Journal of Affective Disorders*. 2018;225:97–103.
- Hall SS, Zygmunt E. "I Hate It Here": Mental Health Changes of College Students Living With Parents During the COVID-19 Quarantine. *Emerging Adulthood*. 2021;9(5):449–61.
- Gruba G, Kasiak PS, Gębarowska J, Adamczyk N, Sikora Z, Jodczyk AM, et al. PaLS Study of Sleep Deprivation and Mental Health Consequences of the COVID-19 Pandemic among University Students: A Cross-Sectional Survey. *International Journal of Environmental Research and Public Health* [Internet]. 2021;18(18).
- Agathão BT, Lopes CS, Cunha DB, Sichieri R. Gender differences in the impact of sleep duration on common mental disorders in school students. *BMC Public Health*. 2020;20(1):148.
- Carrión-Pantoja S, Prados G, Chouchou F, Holguín M, Mendoza-Vinces Á, Expósito-Ruiz M, et al. Insomnia Symptoms, Sleep Hygiene, Mental Health, and Academic Performance in Spanish University Students: A Cross-Sectional Study. *Journal of Clinical Medicine* [Internet]. 2022; 11(7).
- Ramsdal GH, Bergvik S, Wynn R. Long-term dropout from school and work and mental health in young adults in Norway: A qualitative interview-based study. *Cogent Psychology*. 2018;5(1):1455365.
- Esch P, Bocquet V, Pull C, Couffignal S, Lehnert T, Graas M, et al. The downward spiral of mental disorders and educational attainment: a systematic review on early school leaving. *BMC Psychiatry*. 2014;14(1):237.
- Deng Y, Cherian J, Khan NUN, Kumari K, Sial MS, Comite U, et al. Family and Academic Stress and Their Impact on Students' Depression Level and Academic Performance. *Frontiers in Psychiatry*. 2022;13.
- Pascoe MC, Hetrick SE, Parker AG. The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*. 2020;25(1):104–12.
- Worsley JD, Harrison P, Corcoran R. Bridging the Gap: Exploring the Unique Transition From Home, School or College Into University. *Frontiers in Public Health*. 2021;9.
- Limone P, Toto GA. Factors That Predispose Undergraduates to Mental Issues: A Cumulative Literature Review for Future Research Perspectives. *Frontiers in Public Health*. 2022;10.
- Grinshsteyn EG, Whaley R, Couture M-C. Fear of Bullying and Its Effects on Mental Health among College Students: An Emerging Public Health Issue. *Journal of School Violence*. 2021;20(4):536–51.
- Alreshidi SM. Psychometric Properties of the Patient Health Questionnaire-9 for Saudi Caregivers: A Cross-Sectional Study in Saudi Arabia. *INQUIRY*:

- The Journal of Health Care Organization, Provision, and Financing. 2023;61:00469580231221287.
24. Alghadir A, Manzar MD, Anwer S, Albougami A, Salahuddin M. Psychometric Properties of the Generalized Anxiety Disorder Scale Among Saudi University Male Students. *Neuropsychiatric Disease and Treatment*. 2020;16(null):1427–32.
 25. Shah RM, Doshi S, Shah S, Patel S, Li A, Diamond JA. Impacts of Anxiety and Depression on Clinical Hypertension in Low-Income US Adults. *High Blood Pressure & Cardiovascular Prevention*. 2023;30(4):337–42.

This work is licensed under a Creative Commons Attribution-NonCommercial 3.0 Unported License which allows users to read, copy, distribute and make derivative works for non-commercial purposes from the material, as long as the author of the original work is cited properly.