PJAHS • Volume 6 Issue 1 2022 • (doi:10.36413/pjahs.0601.003)

PJAHS
Philippine Journal of Allied Health Sciences

Original Article

Prevalence and Factors Associated with Symptoms of Psychological Distress among Students of Allied Health Sciences in a Nigerian University

Adedapo Wasiu Awotidebe[1], Garba Nasiru Adamu[1], Tukur Muhammad Ali[2], Jibril Mohammed[1], Isa Usman Lawal[1], Aliyu Lawan[3]

[1]Department of Physiotherapy, Faculty of Allied Health Sciences, Bayero University Kano, P.M.B.3011, Nigeria, [2]Department of Psychiatry, Faculty of Clinical Sciences, Bayero University Kano, Nigeria.,[3]Department of Medical Rehabilitation, Faculty of Allied Health Sciences, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria

Correspondence should be addressed to: Adedapo Wasiu Awotidebe[1]; awawotidebe.pth@buk.edu.ng

Article Received: April 5, 2022

Article Accepted: June 24, 2022

Article Published: August 15, 2022

Abstract

Background: A student enrolled in Allied Health Sciences has a curriculum and academic standards that are different compared to a student enrolled in a medical programme. Nevertheless, little is known about the psychological distress of this population. Our objective was to determine whether psychological distress is prevalent in students enrolled in an Allied Health Sciences programme, as well as factors that contribute to it. **Methods:** Three hundred and thirty-three (333) undergraduates studying Allied Health Sciences, ages 18-30, were included in this cross-sectional study. A representative sample of students from nursing, physiotherapy, medical laboratory science, medical radiography, and optometry programmes were selected through a stratified sampling technique. A 21-item Depression Anxiety and Stress Scale (DASS-21 ≥ 10) was used to collect data on psychological distress indicated by depression, anxiety, and stress. We fitted a multivariate logistic regression to identify factors associated with psychological distress among the participants. **Results:** As a result of the study, 58.9% reported depression, 66.1% reported anxiety, and 45.1% reported stress. Depression (*AOR*= 3.23; 95% *CI*: 1.33- 7.81), anxiety (*AOR*= 3.33;95% *CI*:1.34- 8.26) and stress (*AOR*= 2.58;95% *CI*: 1.14-5.85) were associated with family history of mental illness. Poor academic performance was associated with anxiety (*OR*=2.75; 95% *CI*: 1.35- 5.61) and stress (*OR*=2.00; 95% *CI*: 1.05-3.81). **Conclusions:** The prevalence of psychological distress among allied health sciences students is high, especially among students with poor academic performance and those with a family history of mental illness. Psychological distress can be prevented with early detection and awareness programmes.

Key Words: *psychological distress, depression, anxiety, stress, prevalence, risk factors, university students*

INTRODUCTION

A rising number of undergraduate students are suffering from psychological distress, which is a combination of depression, anxiety, and stress. Researchers have found that both preclinical and clinical students are more affected by the problem[1-3] because of a number of reasons such as inadequate training resources, overcrowded classrooms,[4] and poor mental health.[5] Even more worrying, many of these students with depressive symptoms have poor academic performance,[3] and they abuse alcohol and smoke cigarettes, among other substances.[5] Moreover, the affected students also have a high rate of non-completion of their programs of study,[6] and continue to experience mental health issues that make them susceptible to clinical error after graduation .[7]

Compared to the general population of the same age group, clinical students experienced a higher rate of psychological distress.[8] For example, based on a systematic review of evidence, the reported pooled estimate of psychological distress among 10,421 medical students in Nigeria was 25.2%.[9] In the same study, sixty-one

percent of respondents reported stress, 33.5% reported depression, and 28.8% reported anxiety.

According to the literature, psychological distress among university students is influenced by a variety of factors, including demographics, behavioural patterns, and social factors. There is increasing evidence that psychological distress among university students is more prevalent among female students,[10, 11] smokers,[12, 13] aged ≥ 20 years,[11, 12] and students with a family history of mental illness and a lack of social support, [14, 15] and students facing parental pressure about the future.[16,17] These factors, however, can be recognized and prevented in the early stages of the healthcare process in order to ensure a healthy future for students. The model developed by Bisson 2017[18] provides a theoretical framework to support this study. It asserts that social support moderates the negative academic effects associated with depression and anxiety.

To this end, multidisciplinary healthcare delivery systems utilize allied health professionals such as nurses, medical laboratory scientists, physiotherapists, and radiographers, to provide specialized clinical care. The academic environment in which the allied health sciences students are trained overlap with that in which medical students are trained, but different curricula and academic standards exist. The psychological distress experienced by allied health sciences students is not well understood, and generalizing findings from medical students may not be appropriate. Psychological distress is predicted to be prevalent among students studying allied health sciences, and a study like this may be able to offer foundation for intervention strategies to reduce it. The purpose of this study was to determine the prevalence and associated factors of psychological distress among students of allied health sciences.

METHODS

Ethical Consideration. This study was approved by the Research and Ethics Committee of the Kano State Ministry of Health (SHREC/2021/2476), and all ethical procedures were conducted in accordance with the revised Declaration of Helsinki.[19] Our research was conducted with informed consent obtained from all participating students, who were provided with assurances of anonymity and confidentiality as well as about their right to voluntary participation and withdrawal. In order to administer the questionnaire, students had to sign and return a consent form. As part of the data collection process, researchers and assistants met with students during the free class period. The researchers and assistants answered questions and ensured that each student filled out the questionnaire independently.

Study Design and Participants. We collected cross-sectional data from the allied health sciences students of the Bayero University, Kano. There are about 35,000 students in 13 faculties at Bayero University, located in Nigeria's North-West region. Between April and June 2021, we enrolled 333 undergraduate students aged 18-30 years in nursing, physiotherapy, medical laboratory science, medical radiography, and optometry programs

Sampling and sample size. A student who enrolls in the Faculty of Allied Health Sciences is eligible to enroll in Nursing, Physiotherapy, Medical Laboratory Science, Medical Radiography, and Optometry. Optometry is the only program with a six-year duration; the rest are five-year programs. The total number of students in class on the day of data collection served as a sampling frame for recruitment; a simple random selection method was used based on the proportions of each stratum.

The sample size was calculated based on Yamane's formula given in equation[20]:

$$n = \frac{N}{1 + N(e)^2}$$

where *n*= sample size; *N*= total student population in the faculty of Allied Health Sciences (1,754); *e* = margin of error (0.05). As a result of these sample size inputs, a minimum sample size of 326 was obtained. After allowing for 10% non-compliance from participants, the final sample size was estimated at *n*= 360. A stratified sampling approach was used, with sample sizes calculated according to the total population of each department (stratum): nursing ($\frac{488}{1754}$ x 360 = 100), physiotherapy ($\frac{353}{1754}$ x

360 = 73), medical laboratory science ($\frac{346}{1754}$ x 360 = 71), optometry ($\frac{312}{1754}$ x 360 = 64), and medical radiography ($\frac{255}{1754}$ x 360 = 52).

Participants were recruited using a simple random procedure based on the proportion of participants in each stratum.

Data collection, variables, and sources of data. A questionnaire was used to collect data on age, gender, marital status, year of study, residential setting, mental health history of parents, academic performance, parental expectations, and class workload. This study measured social support using a multidimensional social support scale (MSSS),[21] which involves 12 items (Likert scale: 1-6) that are reliable, consistent, and have excellent concurrent and construct validity.[22] Examples of items are "my family tries to help me" and "I can count on my friends when things go wrong." The higher the score, the higher the level of social support. A 21-item scale, the Depression Anxiety Stress Scale (DASS-21), was used to determine symptoms of psychological distress, which consists of depression, anxiety, and stress.[23] There have been good reporting on the reliability and validity of the DASS-21.[24] The categorization and scoring of DASS-21 are illustrated below in Table 1. These categories were collapsed into three: Normal (No), Mild/Moderate (Moderate), and Severe/Extremely severe (Severe) to illustrate the prevalence of mental health, and we further dichotomized these three categories into 0 = No, 1 = Moderate/Severe, for the logistic regression model. The International Physical Activity Questionnaire-SF was used to assess physical activity and collect information on activity frequency, intensity, and duration in the last seven days.[25]

Statistical Analysis. We performed Kolmogorov-Smirnov and Levene's tests for all continuous variables to determine normality and homogeneity of variance. Our analysis of physical activity (MET/week) revealed that it is not normally distributed (p-value < 0.05), and we transformed its logarithm to the base of 10. Frequencies and percentages were provided for depression, anxiety, stress, and categorical demographic variables. Continuous variables (age, social support, and physical activity) were reported as mean and standard deviation. We used multivariate logistic regression to estimate the likelihood that a participant would report depression, anxiety, and stress, taking into consideration the influence of demographic factors, academic workload, parental expectation, smoking status, social support, and physical activity. The data was analyzed using Statistical Package for Social Science (SPSS) software (© IBM, version 25). A p-value of < 0.05 was considered statistically significant for all analyses.

Table 1. Categorization and scoring of DASS-21.

Categories	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	≥28	≥20	≥34

RESULTS

Demographic and related characteristics of participants. The study included 333 undergraduate students (23.35 ± 2.33 years, 54.35% male, 45.65% female) from the Faculty of Health Sciences. A majority of the students (89.19%) were single, and 31.83% came from the Nursing Science department. Approximately 31.23% reported poor academic performance, 39.34% a high workload burden, and 14.41% a family history of mental health issues (Table 2).

Prevalence of depression, anxiety, and stress. In total, 43.24% of the participants reported moderate depression, 15.62% had severe depression, 41.15% had moderate anxiety, and 24.92% had severe anxiety. Similarly, 36.94% reported moderate stress, and 8.11% reported severe stress. Students from both sexes had similar rates of depression, anxiety, and stress (p>0.05) (Table 3).

Factors associated with depression, anxiety, and stress among the participants. According

Table 2. Descriptive demographic characteristics of the participants (*n*= 333).

Variables		Frequency	Percent (%)	95% CI
Age (year)	*Mean±SD*	23.35±2.33	-	23.11-23.64
Age (%)	*≤20 years*	48	14.59	11.16-18.84
	≥21 years	281	85.41	81.15-88.83
Sex	*Male*	181	54.35	48.96-59.65
	Female	152	45.65	40.34-51.04
Marital status	*Single*	297	89.19	85.36-92.11
	Married	36	10.81	7.89-14.64
Department	*Nursing*	106	31.83	27.03-37.05
	Physiotherapy	84	25.23	20.84-30.19
	Radiography	55	16.52	12.89-20.92
	Optometry	47	14.11	10.76-18.30
	Medical Lab.	41	12.31	9.18-16.31
Year of study	*Year 1*	57	17.12	13.43-21.57
	Year 2	68	20.42	16.42-25.11
	Year 3	66	19.82	15.87-24.47
	Year 4	66	18.82	15.87-24.47
	Year 5	62	18.62	14.78-23.18
	Year 6	14	4.20	2.50-6.99
Residential	*On-campus*	207	62.16	56.81-67.23
	Off-campus	126	37.84	32.77-43.19
Family history of mental health	*No*	285	85.59	81.37-88.98
	Yes	48	14.41	11.02-18.63
Academic performance (self-report)	*Good*	229	68.77	63.57-73.53
	Poor	104	31.23	26.47-36.43
High parental expectation	*No*	251	75.38	70.44-79.72
	Yes	82	24.62	20.28-29.56
Burden of class workload	*No*	202	60.66	55.29-65.79
	Yes	131	39.34	34.21-44.71
Current smoking status	*No*	300	90.09	86.37-92.88
	Yes	33	9.91	7.12-13.63
Social support	*Mean±SD*	0.73±0.10	-	0.72-0.74
Physical activity level (MET/week)	*Mean±SD*	3.66±0.26	-	3.63-3.68

Table 3. Prevalence of depression, anxiety, and stress among university students in North-western Nigeria.

Variables		Total (*n*= 333)	Male (*n*= 181)	Female (*n*= 152)	*p*-value
Depression					
	No Depression	137 (41.14)	79 (43.65)	58 (38.16)	0.49
	Moderate	144 (43.24)	73 (40.33)	71 (46.71)	
	Severe	52 (15.62)	29 (16.02)	23 (15.13)	
Anxiety					
	No Anxiety	113 (33.93)	63 (34.81)	50 (32.89)	0.86
	Moderate	137 (41.15)	72 (39.78)	65 (42.76)	
	Severe	83 (24.92)	46 (25.41)	37 (24.35)	
Stress					
	No Stress	183 (54.95)	98 (54.14)	85 (55.92)	0.41
	Moderate	123 (36.94)	65 (35.92)	58 (38.16)	
	Severe	27 (8.11)	18 (9.94)	9 (5.92)	

Note: Data presented as n(%).

to an adjusted logistic regression model (Table 4), family history of mental health and smoking were associated with depression, anxiety, and stress (p<0.05). The odds ratio of depression increased with age (*OR*: 2.22; 95% *CI*: 1.08-4.57), and poor academic performance was associated with anxiety (*OR*=2.75; 95% *CI*: 1.35-5.61) and stress (*OR*=2.00; 95% *CI*: 1.05-3.81). Moreover, parental expectations were associated with a nine times greater risk of anxiety (*OR*=9.32; 95% *CI*: 3.21-27.14); while having a strong social support decreased the risk of stress by 0.08% (*OR*= 0.0008;95% *CI*: 0.00002-0.03).

DISCUSSION

According to the study, 58.9% and 66.1% of the participants had symptoms of depression and anxiety, respectively, which is higher than estimates reported by most Nigerian studies, including those by Coker et al.,26 (6.3%, 9.5%) and Ogunsemi et al.,[27] (14.6%, 21.9%), but similar to those of Abiola et al.,[28] (57.5%, 61.6%).

Table 4. Factors associated with depression, anxiety, and stress among university students in North-western Nigeria.

Factors	Depression Multivariate Model OR (95% CI) p-value	Anxiety Multivariate Model OR (95% CI) p-value	Stress Multivariate Model OR (95% CI) p-value
Age	Range: 18-30 years		
≤ 20 years	Reference (OR = 1)	Reference	Reference
≥ 21 years	2.22 (1.08-4.57) 0.03*	1.11 (0.50-2.47) 0.79	1.09 (0.05-2.40) 0.82
Sex			
Male	Reference	Reference	Reference
Female	1.29 (0.78-2.12) 0.98	1.05 (0.60-1.84). 0.87	0.88 (0.52-1.48) 0.63
Marital status			
Single	Reference	Reference	Reference
Married	0.55 (0.24-1.26)	0.53 (0.21-1.32) 0.17	1.07 (0.45-2.56) 0.88
Residential			
On-campus	Reference	Reference	Reference
Off-campus	3.23 (1.33-7.81). 0.01*	1.56 (0.85-2.87) 0.15	1.18 (0.66-2.11) 0.57
Family history of mental health problem			
No	Reference	Reference	Reference
Yes	3.23 (1.33-7.81). 0.01*	3.33 (1.34-8.26) 0.01*	2.58 (1.14-5.85) 0.02*
Academic performance			
Good	Reference	Reference	Reference
Poor	1.55 (0.81-2.97). 0.19	2.75 (1.35-5.61) 0.01*	2.00 (1.05-3.81) 0.04*
Parental expectation			
No	Reference	Reference	Reference
Yes	0.97 (0.48-1.97) 0.93	9.32 (3.21-27.14) 0.001*	1.54 (0.76-3.15) 0.23
Classroom workload			
No	Reference	Reference	Reference
Yes	0.87 (0.51-1.47) 0.60	1.69 (0.91-3.13) 0.10	0.60 (0.34-1.07) 0.09
Current smoking status			
No	Reference	Reference	Reference
Yes	3.06 (1.13-8.23) 0.027*	6.55 (1.98-21.65) 0.002*	3.83 (1.50-9.76) 0.01*
Social support	0.24 (0.01-4.60) 0.35	0.34 (0.01-9.90) 0.53	0.0008 (0.00002-0.03) 0.001*
Physical activity level	0.65 (0.23-1.89) 0.43	2.89 (0.89-9.37) 0.08	1.58 (0.49-5.04) 0.44

*sig. at p<0.05

Alternatively, one could attribute higher rates of depression and anxiety in our study to the spate of insurgency and banditry in Northern Nigeria over the years. We noted, however, that an

earlier study using a Mini-International Neuropsychiatric Interview found a much lower prevalence of depression among Northern Nigeria medical students.[29] Regardless, our study highlights an increasing trend in mental health problems among students in tertiary institutions. As a result, university administrators may be able to re-orient their training curriculum to include strategies for early screenings and support services as part of the training for allied health students. Despite the spate of insurgency that has swept Northern Nigeria over the past few years, we found that the prevalence of stress reported in our study was lower than that reported in Coker et al.[26] It is possible that susceptibility to stress may have been higher because Lagos State, where their study took place, was considered one of the world's five most stressful cities.[30]

Neither male nor female students in the present study showed significant differences in depression, anxiety, or stress. Similar results were found in another study conducted in the South-Eastern part of Nigeria.[31] This finding differs from overwhelming evidence suggesting that female students are more susceptible to mental health problems than their male counterparts of the same age.[11, 13, 32] Furthermore, our study showed that depression risk increases with age, particularly among students who are over the age of 20. This has been demonstrated in a previous study conducted among Egyptian university medical students.[11] This contrasts with a Nigerian study that concluded that increased depression risk is associated with a younger age. [29] It should be emphasized that a direct comparison with our study should be interpreted with caution due to differences in outcome assessment of depression.

Further, a family history of mental health was related to a higher likelihood of depression, anxiety, and stress, which has been found in previous studies.[14, 15] During the undergraduate training years of a student, it may be beneficial to ask about their family history of mental health in order to identify students who are vulnerable to mental health problems. Consistent with previous studies, anxiety and stress were associated with poor academic performance.[3, 33] Psychological distress appears to be triggered by students performing poorly in their academic work, providing psychological support to such students seems important. As with previous studies[5,12,13], smoking was also associated with depression, anxiety, and stress in this study. A study found a lack of social support among students who smoke cigarettes. [34] It has also been found that depression can be exacerbated when there are no close friends or relatives to talk with.[26] Our study found that students with good social support reported less stress than those without social support. Having access to social support has been associated with reduced odds of psychological distress in previous studies.[14, 35] In addition to teaching students of allied health sciences strategies to improve social support, we recommend incorporating coping strategies to improve psychological wellbeing into the curriculum.

Strengths and Limitations of the Study. As far as we know, this is the first study to involve students from all major allied health professions. We believe the findings are generalizable to allied health science students due to our relatively large sample size.

There are, however, some limitations to the current study, so its findings should be interpreted cautiously. First, the present study used self-reports, which can be accompanied by social desirability bias.[36] This bias was reduced by assuring participants of anonymity. Second, a more reliable estimate would, however, likely result from an objective assessment of psychological distress. Lastly, despite that there is no difference between cross-sectional and longitudinal research regarding depression among medical students.[37] We still recommend longitudinal studies since they would provide richer insights into students' progression from beginning to end of their study, as well as potentially identify the causes of psychological distress.

CONCLUSION

In summary, psychological distress is pronounced among students of allied health sciences. This is particularly true for those who come from families that have a history of mental illness and/or students with poor academic

performance. Early screening and awareness programs should be part of the learning and teaching curriculum for students of allied health sciences.

Individual Author's Contributions

The manuscript was conceived, designed, drafted, and revised by AWA. In addition to collecting and interpreting the data, GNA revised the manuscript. Analyzing and interpreting data was done by TMA, as well as revising the manuscript critically. JM contributed to data analysis, interpreted data, and revised the manuscript's intellectual content. Several contributions were made to the study design, data analysis, and critical revisions to the manuscript by IUL. AL reviewed and revised the intellectual content for the final revision. All authors revised and approved the final revision of the manuscript.

Disclosure Statement

The authors received no funding for this project.

Conflicts of interest

All authors report no conflict of interest.

Acknowledgment

The authors would like to thank Mrs. Oladokun Sherifat for assisting with the language editing of the manuscript.

References

1. Stallman HM. Psychological distress in university students: a comparison with general population data. Australian Psychologist. 2010; 45(4).
2. Oku A, Oku O, Owoaje E, Monjok E. An assessment of mental health status of undergraduate medical trainees in the University of Calabar, Nigeria: a cross-sectional study. Open Access Macedonian Journal of Medical Sciences. 2015;3(2):356-362.
3. Falade J, Oyebanji AH, Babatola AO, Falade OO, Olumuyiwa TO. Prevalence and correlates of psychiatric morbidity, comorbid anxiety and depression among medical students in public and private tertiary institutions in a Nigeria state: a cross-sectional study. Pan Africa Medical Journal. 2020; 37:53.
4. Omigbodun OO, Odukogbe A, Omigbodun AO, Yusuf OB, Bella TT, Olayemi O. Stressors and psychological symptoms in students of medicine and allied health professions in Nigeria. Social Psychiatry Psychiatric Epidemiology. 2006;41(5): 415-21.
5. Makanjuola A, Abiodun O, Sajo S. Alcohol and psychoactive substance use among medical students of the University of Ilorin, Nigeria. European Scientific Journal. 2014;10(8).
6. Clark DC, Zeldow PB. Vicissitudes of depressed mood during four years of medical school. JAMA. 1988; 260:2521–28.
7. West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD. Association of resident fatigue and distress with perceived medical errors. Journal of the American Medical Association. 2009;302(12):1294-300.
8. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Academic Medicine. 2006; 81(4):354–73.
9. Esan O, Esan A, Folasire A, Oluwajulugbe P. Mental health and wellbeing of medical students in Nigeria: a systematic review. International Review of Psychiatry. 2019; 31: 661-672.
10. Ibrahim MB, Abdelreheem MH. Prevalence of anxiety and depression among medical and pharmaceutical students in Alexandria University. Alexandria Journal of Medicine Elsevier. 2015;51(2):167–73.
11. Abdel Wahed WY, Hassan SK. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. Alexandria Journal of Medicine. 2016; 53:77-84.
12. Ramon-Arbues E, Gea-Caballero V, Granada-Lopez JM, Juarez-Vela R, Pellicer-Garcia B, Anton-Solanas I. The prevalence of depression, anxiety and stress and their associated factors in college students. International Journal of Environmental Research and Public Health. 2020; 17, 7001.
13. Kulsoom B, Afsar NA. Stress, anxiety, and depression among medical students in a multi-ethnic setting. Neuropsychiatric Disease and Treatment. 2015; 11: 1713-1722.
14. Mboya IB, John B, Kibopile ES, Mhando L, George J, Ngocho JS. Factors associated with mental distress among undergraduate students in northern Tanzania. BioMed Central. 2020; 20: 28.
15. Dachew BA, Azale BT, Gebremariam BR. Prevalence of Mental Distress and Associated Factors among Undergraduate Students of University of Gondar, Northwest Ethiopia: A Cross-Sectional Institutional Based Study. PLoS ONE. 2015; 10(3): e0119464.
16. Vaez M, Ponce de Leon A, Laflamme M. Health related determinants of perceived quality of life: a com-

parison between first-year university students and their working peers. Work. 2006; 26:167–177.

17. Yussuf A, Issa B, Ajiboye P, Buhari OI. The correlates of stress, coping styles and psychi- atric morbidity in the first year of medical education at a Nigerian University. African Journal of Psychiatry. 2013; 16(3), 206–215.
18. Bisson KH. The effect of anxiety and depression on college students' academic performance: exploring social support as a moderator [electronic theses and dissertation]. Abilene Christian University, Texas, United States: Digital Commons; 2017.
19. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles of medical research involving human subjects. Journal of the American Medical Association. 2013; 310 (20): 2191-4.
20. Yamane T. Statistics: An Introductory Analysis. 2nd Edition, New York: Harper and Row.
21. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. Journal of Personality Assessment. 1988;52(1):30–41.
22. Kazarian SS, McCabe SB. Dimensions of social support in the MSPSS: factorial structure, reliability, and theoretical implications. Journal of Community Psychology.1991; 19 (2): 150-160.
23. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales, Psychology Foundation, Sydney, Australia, 2nd edition, 1995
24. Makara-Studzinska M, Tybuski E, Zaluski M, Adamczyk K, Mesterhazy J, Mesterhazy A. Confirmatory factor analysis of the three versions of the depression anxiety stress scale (DASS-42, DASS-21 and DASS-12) in Polish adults. Front Psychiatry. 2021; 12:770532.
25. The IPAQ Group. The IPAQ Group Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire. Available online: http://www.ipaq.ki.s
26. Coker AO, Coker OO, Sanni D. Sociodemographic correlates and symptoms of depression, anxiety and stress among a sample of Nigerian medical students. Nigerian Journal of Basic and Clinical Sciences. 2018; 15:58-62.
27. Ogunsemi O, Afe T, Odusan O, Oguntona S, Adefuye B, Oyelekan, A. Psychological well-being of medical students in a state university, Nigeria. Research Journal of Health Sciences.2013; 1(1), 90–98.
28. Abiola T, Lawal I, Habib ZG. Psychological distress due to academic stress among clinical students in a Nigerian tertiary institution: comparison between medical and physiotherapy students. Nigerian Journal of Basic and Clinical Sciences. 2015; 12: 81-85.
29. Suraj SS, Umar BI, Gajida AU, Umar MU. Prevalence and factors associated with depression among medical students in Nigeria. Nigeria Postgraduate Medical. Journal. 2021; 28: 198-203.
30. National Bureau of Statistics. Lagos household survey. Central Office of Statistics 2014. Lagos State Government.
31. Nwobi E, Ekwueme O, Ezeoke U. Mental depression and coping strategies among medical students of University of Nigeria, Enugu Campus. International Journal of Medicine and Health Development. 2009;14(1), 42–48.
32. Iqbal S, Gupta S, Venkatarao E. Stress, anxiety and depression among medical undergraduate students and their socio-demographic correlates. Indian Journal of Medical Research. 2015; 141, 354–357.
33. Omokhodion FO. Psychosocial problems of pre- clinical students in the University of Ibadan Medical School. African Journal of Medicine and Medical Sciences. 2003; 32(2), 135–138.
34. Steptoe A, Wardle J, Pollard TM, Canaan L, Davies GJ. Stress, social support and health-related behavior: a study of smoking, alcohol consumption and physical exercise. Journal of Psychosomatic Research. 1996; 41 (2): 171-80.
35. Bore M, Kelly B, Nair B. Potential predictors of psychological distress and well-being in medical students: a cross-sectional pilot study. Advances in Medical Education and Practice. 2016; 7:125-135.
36. Latkin CA, Edwards C, Davey-Rothwell MA, Tobin KE. The relationships between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. Addictive Behaviors. 2017; 73: 133-136.
37. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. Journal of the American Medical Association. 2016;316(21):2214-36.