Psychometric Analysis of Undergraduate Nursing Students using Depression, Anxiety and Stress Scale: A Cross-sectional Study

SUNIL CHOUHAN[1], AKRITI GUPTA[2], RUCHI SINGH[3], ANZAR B ALVI[4]

ABSTRACT

Introduction: Students at nursing colleges encounter not only issues associated to individual life, but also learning difficulties. The rigor in professional training may predispose them to depression, anxiety and stress.

Aim: To investigate the prevalence and psychometric condition such as depression, anxiety, and stress symptoms in undergraduate nursing students.

Materials and Methods: This was a cross-sectional study on 387 female nursing students, aged between 18-27 years (21.16±1.52) from AIIMS, Bhopal and Gandhi Medical College, Bhopal, Madhya Pradesh, India. They were analysed using Depression, Anxiety and Stress Scale-42 (DASS-42). This self-administered anonymous questionnaire was distributed through 'WhatsApp' web and e-mail, in the form of "Google form" to all the enrolled students. The Microsoft Office Excel 2010 and Statistical Package for The Social Sciences (SPSS) software was used to analysed the data using percentages.

Results: The questionnaire was filled by 223 out of 387 students. The response rate was 57.62 percent. The mean age of the respondents were 21.16 years (±1.52 years). The prevalence of depression, anxiety and stress prevalence were 36.7%, 49.33% and 34.98%, respectively. In the depression and anxiety traits, majority of students were in moderate stage (14.35%, 21.08%), while in stress, majority (17.04%) of students were in mild stage. Spearman correlation found a significant moderate positive relationship between depression and anxiety (r=0.592, p<0.001), depression and stress (r=0.578, p<0.001), anxiety and stress (r=0.652, p<0.001).

Conclusion: Among the undergraduate nursing students, depression, anxiety and stress was found to be remarkable. Hence, it is necessary to enhance mental well-being among nursing students. The results allow for anxiety control screening measures and expanded rehabilitation and treatment to be initiated for the students.

INTRODUCTION

Mental health is just as critical as physical health. Infact, women are more vulnerable to depression [1,2]. Traditionally, nursing is a female profession in contrast to non-medical students. Nursing undergraduates usually suffer from mental well-being related problems more than other health related issues [3,4]. Students of nursing who join the undergraduate programme commonly suffer from problems related to stress or psychological morbidity, which may progress further during their training programme. They may suffer from uncertainty or disagreement, dissatisfaction and poor self-esteem when confronted with complicated health conditions [5]. Lack of professional preparation, practical experience in hospitals and dealing with difficult patients are exacerbated with work-related stress in younger nurses on a case-by-case basis, and often they suffer from psychological distress resulting in mental illness [6].

The undergraduate nursing curriculum provides for participation in the clinical setting apart from the theoretical lectures, where the students may experience difficult circumstances affecting their personal and professional life [7]. They face issues related to achieving professional skills, achieving good academic results, inadequate expertise and preparation, inadequate medical services, lack of manpower or intense training [8]. As such, undergraduate nursing students are subject to multiple difficulties and challenges that can contribute to symptoms of depression and anxiety such as mental instability [7,9].

Depression is the most common mental health condition with symptoms of depression, lack of interest or satisfaction in every day tasks, feelings of shame or low self-esteem, sleep disturbances, altered appetite, exhaustion, and diminished focus [10]. Anxiety and stress are mental health concerns marked by elevated agitation, worry, and certain physical changes such as anxiety auto nomicarousal. The sign may be high blood pressure, tachycardia and sweating. Skeletal muscle spasm is also common, according to the American Psychological Association [11]. Stress may be a deterrent to attention, problem solving, decision-making and other cognitive skills required for students [12]. Increasing tension may impair their ability to cope with difficult circumstances and with patients. They often feel angry, burnt out, annoyed and tired in that state, raise latency in sleep, insomnia, leading to depression [13,14].

Early identification of depression and anxiety in undergraduate nursing can reduce the negative effect of depression on mental well-being; hence certain policies can be made by the administrators to tackle with problem [15]. Various accessible devices may be used to determine emotional well-being. One such tool is the DASS-42 assessment questionnaire, which is a comprehensive and validated instrument to identify depression, anxiety, and stress attributes [16]. The aim of this analysis was to assess prevalence of depression, anxiety and stress among nursing students at the All India Institute of Medical Sciences and Gandhi Medical College, Bhopal. The correlation between depression, anxiety and tension in nursing students was also determined in study.

MATERIALS AND METHODS

This cross-sectional type of web-based survey study was carried out at the All India Institute of Medical Sciences (AIIMS) and Gandhi

Medical College (GMC), Bhopal. The research was carried out between June and September 2020. This study was approved via order no. (IHEC-LOP/2020/IMO240 dated 3.3.20) by research review board and by Ethical Committee of the Institute (AIIMS, Bhopal) before its commencement.

Inclusion criteria: The study population included 1st, 2nd, 3rd and 4th year of female nursing students, who were pursuing their four-year B.Sc. (Bachelor of Science) graduation course in the study institute. All the students were healthy and there was no family history of psychiatric illness or history of any long-term medication of any kind.

Exclusion criteria: The students, already on any psychiatric treatment, were excluded from the study. The exclusion criteria were stated in the participant information sheet in the Google form.

DASS-42 as a study tool: Depression, anxiety and symptoms of stress were measured by Lovibond and Lovibond's original version of the DASS-42. It is a self-reporting tool constructed to measure the severity of the negative emotional states of depression, anxiety, and stress. It has a sub-scale for each of the three categories of depression, anxiety and stress, each of which contains 14 items. In this study, the original DASS 42-item questionnaire scale was used after obtaining permission from the researcher [17].

Data collection: The questionnaire DASS-42 was generated in Google form. This form was divided into four sections; demographic, participant information sheets, consent form and DASS-42 questionnaire. After clicking in the box marked as 'yes, I give my consent' by the subject, they were automatically taken to the page of DASS scale where they were supposed to fill the 42 questionnaires. A mass e-mail and WhatsApp invitation was sent with a hyperlink to all eligible students.

This questionnaire was divided in three sub sections before analysis. Each sub section comprised of fourteen items related to the three aspects of mental health symptoms assessment, which were depression, anxiety and stress. All the respondents had to mention their symptoms on a 4-point Likert scale scoring from 0 to 3 (0: did not apply to me at all, 1: applied to me some degree, or some of the time; 2: applied a considerable degree, or a good part of time; 3: applied very much or most of the time). The more serious the signs are, the higher the subscale scores in each subsection.

STATISTICAL ANALYSIS

Scores from each subsection were summed up and categorised as "normal", "mild", "moderate", "severe" and "extremely severe", according to the DASS manual [Table/Fig-1] [17]. The prevalence of the depression, anxiety and stress were measured in terms of the percentage involvement in the sample population and involvement in different years of training in nursing education, using Microsoft Office Excel 2010 [Table/Fig-2]. Then correlation of depression with anxiety and stress, and anxiety with stress were measured

via spearman correlation by using Statistical Package for The Social Sciences (SPSS) (16.0) software. A p-value less than 0.05 considered as significant.

Severity	Depression score	Anxiety score	Stress score
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+

[Table/Fig-1]: Depression, Anxiety and Stress Scale (DASS) severity rating [17].

	First year	Second year	Third year	Fourth year	p-value
Depression	9.04±9.51	5.75±5.78	7.58±8.71	9.51±8.81	<0.01
Anxiety	8.5±6.94	8.18±6.26	7.62±6.34	10.08±7.03	<0.01
Stress	10.9±8.59	11.21±6.26	10.36±8.94	14.4±8.81	<0.01

[Table/Fig-2]: Mean score of depression, anxiety and stress in nursing students.

RESULTS

In this study, the response rate was 57.62% (n=223). In each academic year, there were 100 students. Five of the students, filled the form incompletely, therefore their data were excluded from the study. The age range of the female nursing students were 18-27 years (Mean=21.16±1.52 years). Prevalence of depression, anxiety and stress was 36.77%, 49.33% and 34.98%, respectively. In depression and anxiety traits, majority of students were in moderate stage (14.35%, 21.08%), while in stress, majority (17.04%) of students were in mild stage [Table/Fig-3,4].

Severity	Depression	Anxiety	Stress
Normal	141 (63.23%)	113 (50.67%)	145 (65.02%)
Mild	26 (11.66%)	22 (9.87%)	38 (17.04%)
Moderate	32 (14.35%)	47 (21.08%)	24 (10.76%)
Severe	15 (6.73%)	27 (12.11%)	13 (5.83%)
Extremely severe	9 (4.03%)	14 (6.27%)	3 (1.35%)

[Table/Fig-3]: Distribution of all nursing students (n=223) based on severity of the psychological traits.

The descriptive analysis of year-wise psychological trait of the nursing students indicates that depression, anxiety and stress, all were comparatively more in the 4th or final year of the nursing student while depression was lesser in the 2nd year and none of the 2nd year student had extremely severe depression and stress. The anxiety was more as compare to depression and stress in each year of the students. Spearman correlation found a significant positive relationship between depression and anxiety (r=0.592, p<0.01), depression and stress (r=0.578, p<0.01), anxiety and stress (r=0.652, p<0.01) [Table/Fig-5].

Traits	Year	Normal		Mild		Moderate		Severe		Extremely severe	
		No.	%	No.	%	No.	%	No.	%	No.	%
Depression	1st (41.05%)	56	58.94	12	12.63	15	15.79	7	7.37	5	5.26
	2nd (21.21%)	26	78.78	3	9.09	2	6.06	2	6.06	0	0.00
	3rd (32%)	34	68.00	6	12.00	4	8.00	4	8.00	2	4.00
	4th (44.43%)	25	55.55	5	11.11	11	24.44	2	4.44	2	4.44
Anxiety	1st (49.48%)	48	50.52	9	9.47	21	22.11	11	11.58	6	6.32
	2nd (48.49%)	17	51.51	4	12.12	7	21.21	3	9.09	2	6.06
	3rd (44%)	28	56.00	6	12.00	9	18.00	4	8.00	3	6.00
	4th (55.56%)	20	44.44	3	6.67	10	22.22	9	20.00	3	6.67
Stress	1st (31.58%)	65	68.42	13	13.68	12	12.63	3	3.16	2	2.11
	2nd (33.33%)	22	66.67	8	24.24	2	6.06	1	3.03	0	0.00
	3rd (32.00%)	34	68.00	9	18.00	2	4.00	5	10.0	0	0.00
	4th (46.67%)	24	53.33	8	17.78	8	17.78	4	8.89	1	2.22

[Table/Fig-4]: Descriptive analysis of psychological traits.

Traits		Depression	Anxiety	Stress
Depression	r	1		
	p			
	n	82		
Anxiety	r	0.592**	1	
	p	<0.001		
	n	82		
Stress	r	0.578**	0.652**	1
	p	<0.001	<0.001	
	n	82	110	

[Table/Fig-5]: Correlation (Spearman's rho) between depression, anxiety and stress.
r: correlation, p: p-value, n: number of students; p -value less than 0.05 considered as significant

DISCUSSION

One of the key issues for policy makers in every country should be nursing mental well-being and their education as they are the bridge between the doctor and the patient that provide health care services. This research was carried out at AIIMS Bhopal and GMC Bhopal to explore the incidence of depression, anxiety and stress at various years of nursing education training and in complete total as a whole. The findings of this study suggest that there is a remarkable prevalence of symptoms of depression (36.77%), anxiety (49.3%) and stress (34.98%) among nursing students. Researches on mental well being of nursing students under taken in other nations suggested that depression, anxiety and stress are prevalent among nursing students. Compared to the research in Sri Lanka [7], the prevalence of depression (51.1%), anxiety (59.8%) and stress (82.6%) is far higher in the index study, but their sample size (n=92) was relatively low. The sample from Egypt [22] did not have greater prevalence compared to this research, however, the proportion is consistent with the present analysis [Table/Fig-6]

[7,18-27]. The research conducted in Nepal [23] has a large sample size (n=682). This research showed that students reported moderate to extremely severe levels of depression (51.7%), anxiety (72.9%) and tension (47%). This was close to current study that nursing student anxiety was greater than depression and tension.

The study from Hong Kong used a large sample size of 850, indicating that anxiety is not as common as depression and stress, which were the same as in present research [6]. The latter research used a variety of tools, such as the General Well-being Questionnaire (GHQ-30), the Beck Depression Inventory (BDI-II) and the State-Trait Anxiety Inventory (STAI), and the Precisely Constructed Questionnaire, DASS 21, DASS 42, etc. However, regardless of any tools used to measure stress and anxiety, this study indicated that the mental wellness of nursing students is better than that found in other studies. This descriptive study of the year-wise psychological features of nursing students reveals that depression, anxiety and tension were comparatively greater in the nursing student's 4th or final year, whereas depression was lesser in the 2nd year. However, in the study conducted in Greece, maximum students of 2nd and 3rd years were found affected with stress, but the degree of anxiety and depression were not different among the 4th year of study [20]. The index study found a significant positive association between anxiety and depression, anxiety and stress, as well as depression and stress.

Limitation(s)

As this research was carried out on female nursing students, so the findings cannot imitate the incidence of mental problems among male peers. The socio-economic status was not taken up by this analysis, so the causal association could not be stated. Further analysis is needed on variables correlating with mental health causes or stressors and the effects of poor mental health. The percentage of anxiety was higher in this study sample; this could be attributed to COVID-19 pandemic because the study was done in the middle of this period.

Study place and year	Sample size	Mean age (Years)	Tool used	Final outcome
Vellore, India, 2007 [18]	145		General Health Questionnaire-12	20.7% found with high psychological stress.
Kolkata, 2016 [19]	129	21±0.75	DASS 21-point scale	Moderate to extreme depression- 33.33%; Moderate to extreme levels anxiety -56.59% and moderate to extreme levels of stress 23.26%
Greece, 2008 [20]	170		General Health Questionnaire (GHQ- 30), Beck Depression Inventory (BDI-II) and the State-Trait Anxiety Inventory (STAI).	Depression - 52.4%, Stress -71.8%
Hongkong, 2008 [21]	147	19.1±0.85	NEO Five Factor Inventory, Coping in Stressful Situations questionnaire, the 12- item General Health Questionnaire, the Maslach Burnout Inventory and the Stress in Nursing Students questionnaire	Students found with high levels of psychological morbidity; Stress was also increased.
Egypt, 2011 [22]	373	18.8±1.2	Specially designed questionnaire and hospital anxiety and depression scale (HAD)	Depression -27.9%, Anxiety- 46.6% and Stress- 40.2%
Sri Lanka, 2016 [7]	92	24.1±1.6	Sinhala version of Depression, Anxiety and Stress Scale.	Depression -51.1%, anxiety -59.8% and stress -82.6%
Hongkong, 2015 [6]	850	34-44-year-old (SD±2.79)	Depression, Anxiety and Stress Scale 21	Depression-35.8%, anxiety-37.3% and stress-41.1%
Kathmandu, 2019 [23]	680	20.29±1.65	Depression, Anxiety and Stress Scale 21	51% of students found with moderate to extremely severe levels of stress
Thailand, 2012 [24]	110	22.8±2.8	State Anxiety Scale from the State-Trait Anxiety Inventory Center for Epidemiology Studies- Depression Scale (CES-D) The Rosenberg Self- Esteem Scale (RSE) Perceived Stress Scale (PSS) Multidimensional Scale of Perceived Social Support (MSPSS)	Anxiety-26%, Depression-47%
Akola, 2017 [25]	52	18-25	Depression, Anxiety and Stress Scale (DASS-21)	Depression 69.24%, Anxiety 78.85% and stress 53.85%
Kolar, India, 2015 [26]	430	18-25	Questionnaire	Sadness (47%), Suicidal thoughts (21%), anehdonia (24%), pessimism (30%)
Rishikesh, India, 2016 [27]	199	22±1.96	Rosenberg Self Esteem Scale (RSES), Perceived Stress Scale (PSS-14), and Beck Depression Inventory (BDI)	43.7% severe stress (28.1%) mild & moderate stress. 13.6% borderline depression, 10.6% moderate depression 3.5% severe depression.
Bhopal, India 2020 (Present Study)	223	21.16±1.52	Depression, Anxiety and Stress Scale (DASS-42)	Depression, anxiety and stress prevalence were 36.77%, 49.33% and 34.98%, respectively.

[Table/Fig-6]: Comparison of previous studies [7,18-27].

CONCLUSION(S)

The results suggest that among undergraduate nursing students, signs of depression, anxiety and stress are exceedingly prevalent. These findings can lead to a better understanding of the mental and emotional well-being phenomenon among the nursing students for which efficient strategies and initiatives planning can be made in order to restrict the psychological illness in the students.

REFERENCES

[1] Women's Health. World Health Organization: Geneva, Switzerland, 2013.

[2] Welsh D. Predictors of depressive symptoms in female medical-surgical hospital nurses. Issues Ment Health Nurse. 2009;30:320-26.

[3] Wang AH, Lee CT, Espin S. Undergraduate nursing students' experiences of anxiety- producing situations in clinical practicums: A descriptive survey study. Nurse Education Today. 2019;76:103-08.

[4] Wege N, Muth T, Li J, Angerer P. Mental health among currently enrolled medical students in Germany. Public Health. 2016;132:92-100.

[5] Rafati F, Nouhi E, Sabzevari S, Dehghan-Nayeri N. Coping strategies of nursing students for dealing with stress in clinical setting: A qualitative study. Electronic Physician. 2017;9(12):6120.

[6] Cheung T, Yip PS. Depression, anxiety and symptoms of stress among HongKong nurses: A cross-sectional study. International Journal of Environmental Research and Public Health. 2015;12(9):11072-100.

[7] Rathnayake S, Ekanayaka J. Depression, anxiety, and stress among undergraduate nursing students in a public university in Sri Lanka. International Journal of Caring Sciences. 2016;9:1020-32.

[8] Pulido-Martos M, Augusto-Landa JM, Lopez-Zafra E. Sources of stress in nursing students: A systematic review of quantitative studies. International Nursing Review. 2012;59:15-25.

[9] Gibbons C, Dempster M, Moutray M. Stress, coping and satisfaction in nursing students. J Adv Nurs. 2011;67(3):621-32.

[10] The World Health Report 2001: Mental health: New understanding, new hope. World Health Organization 2001.

[11] Anxiety [Internet]. American Psychological Association. 2020, Washington, DC. [cited 2020 sep 20]. Available from: https://www.apa.org/topics/anxiety/.

[12] Yazdani M, Rezaei S, Pahlavanzadeh S. The effectiveness of stress management training program on depression, anxiety and stress of the nursing students. Iranian Journal of Nursing and Midwifery Research. 2010;15(4):208.

[13] Drury V, Craigie M, Francis K, Aoun S, Hegney DG. Compassion satisfaction, compassion fatigue, anxiety, depression and stress in registered nurses in Australia: Phase 2 results. J Nurs Manag. 2014;22:519-31.

[14] Foxall MJ, Zimmerman L, Standley R, Bene Captain B. A Comparison of frequency and sources of nursing job stress perceived by intensive care, hospice and medical-surgical nurses. J Adv Nurs. 1990;15:577-84.

[15] Njim T, Mbanga C, Mouemba D. Determinants of depression among nursing students in Cameroon: A cross-sectional analysis. BMC Nurs. 2020;19:26. Published 2020 Apr 17. doi:10.1186/s12912-020-00424-y.

[16] Kulsoom B, Afsar NA. Stress, anxiety, and depression among medical students in a multiethnic setting. Neuropsychiatric Disease and Treatment. 2015;11:1713.

[17] Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the beck depression and anxiety inventories. Behav Res Ther. 1995;33:335-43.

[18] Warbah L, Sathiyaseelan M, Vijayakumar C, Vasantharaj B, Russell S, Jacob KS. Psychological distress, personality, and adjustment among nursing students. Nurse Educ Today. 2007;27(6):597-601.

[19] Basu M, Sinha D, Ahamed A, Chatterjee S, Misra RN. Depression, anxiety, stress among nursing students of kolkata: A cross sectional study. Journal of Preventive Medicine and Holistic Health. 2016;2(2):54-60.

[20] Papazisis G, Vlasiadis I, Papanikolaou N, Tsiga E, Sapountzi-Krepia D. Depression and anxiety among nursing students in Greece. Annals of General Psychiatry. 2008;7(1):1.

[21] Watson R, Deary I, Thompson D, Li G. A study of stress and burnout in nursing students in Hong Kong: A questionnaire survey. International Journal of Nursing Studies. 2008;45(10):1534-42.

[22] Amr A, El-Gilany AH, El-Moafee H, Salama L, Jimenez C. Stress among Mansoura (Egypt) baccalaureate nursing students. Pan African Medical Journal. 2011;8:26.

[23] Samson P. Role of coping in stress, anxiety, depression among nursing students of Purbanchal University in Kathmandu. J Nepal Health Res Counc. 2019;17(3):325-30.

[24] Ratanasiripong P. Mental health of muslim nursing students in Thailand. ISRN Nurs. 2012;2012:463471.

[25] Telgote S, Jadhao A. Depression, anxiety and stress among government nursing college students in Akola: A college-based study. Journal of Evolution of Medical and Dental Sciences. 2017;6(90):6297-301.

[26] Nagaraja MGM, Reddy M, Ravishankar S, Jagadisha SN. Study the prevalence of depression among nursing college students of Kolar district, Karnataka state. IOSR Journal of Humanities & Social Sciences. 2015;20(5):135-39.

[27] Kataria RK. Self-esteem, stress and depression in nursing students. Indian Journal of Continuing Nursing Education. 2016;17(1):30.

PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Physiology, AIIMS Bhopal, Bhopal, Madhya Pradesh, India.
2. Senior Resident, Department of Physiology, AIIMS Bhopal, Bhopal, Madhya Pradesh, India.
3. Associate Professor, Department of Physiology, AIIMS Bhopal, Bhopal, Madhya Pradesh, India.
4. Tutor, Department of Physiology, AIIMS Bhopal, Bhopal, Madhya Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Sunil Chouhan,
Associate Professor, AIIMS Bhopal, Bhopal, Madhya Pradesh, India.
E-mail: Sunil.physiology@aiimsbhopal.edu.in

AUTHOR DECLARATION:
• Financial or Other Competing Interests: None
• Was Ethics Committee Approval obtained for this study?   Yes
• Was informed consent obtained from the subjects involved in the study?   Yes
• For any images presented appropriate consent has been obtained from the subjects.   NA