Anxiety, Depression and Stress among Undergraduate Students: A Comparative Study of Mathematics and Engineering Students

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Abstract – Anxiety, depression and stress have been pervasive and severe disorders. The utterance of any of these ailments in human life reflects the prevalence of hurdles. These not only obstruct the physical and mental health of young minds but also hamper other prospects in their lives such as academic success, personal contacts, social relations and family bonds. The present study was conducted on a sample of 201 undergraduate students. A standardised tool was employed to collect data which were computed using Pearson product moment correlation coefficient (r) and multivariate analysis of variance (MANOVA). In this throat cutting competitive era, most learners get suffered from anxiety, depression and stress which cause unrest, dropouts and even suicide attempts. An apparent height of such cases in academic institutions has led the researchers to explore these constructs. Thus, the present research is an earnest attempt to find out the difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender. It also examined the association between anxiety, depression and stress. The results uncovered that there was a significant relationship between anxiety, depression and stress of undergraduate students. There was a significant multivariate main effect of faculty on the combined dependent variables anxiety, depression and stress. There was a significant univariate main effect of faculty on anxiety. Science students had a higher anxiety level than engineering students. There was a significant univariate main effect of faculty on depression. Engineering students had a higher depression level than science students. There was a non-significant univariate main effect of faculty on stress, but engineering students had a bit higher level of stress than science students. There was a significant multivariate main effect of gender on the combined dependent variables anxiety, depression and stress. There was a significant univariate main effect of gender on anxiety and depression. Females had higher scores on anxiety and depression than males. There was a non-significant univariate main effect of gender on stress, but female students scored a bit higher on stress than male students. There was a non-significant multivariate interaction effect of faculty and gender on the combined dependent variables anxiety, depression and stress.

Keywords: Anxiety, Depression, Stress, Undergraduate Students

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INTRODUCTION

"Anxiety and depression cause difficulties across social, occupational, and everyday functioning (Castle, Kulkarni, & Abel, 2006) and have been linked with physical disease, relationship difficulties, and reduced concentration (Nutt, 2004), thus significantly contributing to decrements in sufferers' performance (as cited in Bitsika, Sharpley, & Melhem, 2010)". Anxiety and depression affect respiratory symptoms (Leander et al., 2014). The financial and other issues enhance students' level of anxiety and depression which can disturb academic performance (Andrews & Wilding, 2004). There existed a connection between depression, anxiety and academic achievement. Low scorers had a higher level of anxiety and depression than high achievers. The stress did not affect academic achievement (P & Basha, 2017). Low-achieving students indicated more scores on depression, anxiety and stress than high-achieving students (Yasin & Dzulkifli, 2011). Anxiety, depression and stress are grave concerns which can damage health, creativity, and productivity. These syndromes may cause mental illness.

More than half respondents were affected by stress, anxiety and depression. Women had higher scores on these constructs than men (Iqbal, Gupta, & Venkatarao, 2015). School dropouts showed a higher level of stress, depression and anxiety than school-attending adolescents (Singh, Junnarkar, & Sharma, 2015). In student life, it is vital to be healthy physically and mentally to improve social conscience. Thus, it is indispensable to observe each learner to identify any symptom of maladjustment.

There was a significant positive association between depression, anxiety and stress of undergraduate nursing students (Rathnayake & Ekanayaka, 2016). Female respondents exhibited more depression, anxiety and stress (DAS) than male participants (Singh, Goel, Sharma, & Bakshi, 2017). Arts students revealed a higher level of depression, anxiety and stress than commerce and science students (Baviskar, Phalke, & Phalke, 2013). Females had high scores on stress, anxiety and depression than males. Science students exhibited a more elevated level of stress, anxiety and depression than arts students (Wani et al., 2016). Those mothers who exercised a few times per week were less prone to psychological distress, depression, anxiety and stress than those who did not exercise (Lovell, Huntsman, & Hedley-Ward, 2015). Maladaptive strategies emerged as outcomes of depression, anxiety and stress (Mahmoud, Staten, Hall, & Lennie, 2012).

RATIONALE OF THE STUDY

It is rightly said that the future of a nation is being shaped in classrooms, but the products of that classroom must be healthy physically, mentally, emotionally and spiritually. The present era is a time of throat cutting competition and specialisation, so each person faces vivid challenges and struggles in different ways. In that way, an individual may get suffered from anxiety, depression or stress. In this study, the researcher intended to find out the difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender and also examined the association between anxiety, depression and stress. Detection of these symptoms in students at an early stage is advantageous to counsel well and to cure them quickly. Thus, they must have confidence, adaptability and mental poise. In this way, the learner can maintain health as well as academic success.

ANXIETY, DEPRESSION AND STRESS

The American Psychological Association defines anxiety, depression and stress in these words:

"Anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure".

"Depression is more than just sadness. People with depression may experience a lack of interest and pleasure in daily activities, significant weight loss or gain, insomnia or excessive sleeping, lack of energy, inability to concentrate, feelings of worthlessness or excessive guilt and recurrent thoughts of death or suicide".

"Stress can be a reaction to a short-lived situation, such as being stuck in traffic. Or it can last a long time if you're dealing with relationship problems, a spouse's death or other serious situations. Stress becomes dangerous when it interferes with your ability to live a normal life over an extended period. You may feel tired, unable to concentrate or irritable. Stress can also damage your physical health".

VARIABLES IN THE PRESENT STUDY

Dependent Variables: Anxiety, Depression, Stress.

Independent Variables: Faculty (science & engineering), Gender (male & female).

OBJECTIVES OF THE STUDY

The present study is based on the following objectives:

1. To study the relationship between anxiety, depression and stress of undergraduate students.

2. To find out the difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender.

HYPOTHESES

$H_0$1. There will be no significant relationship between anxiety, depression and stress of undergraduate students.

$H_0$2. There will be no significant difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender.

DELIMITATIONS OF THE STUDY

These followings delimit this study:

1. The present study is bound to final year undergraduate students of Aligarh Muslim University, Aligarh, U.P.

2. The present study is restricted to gender (male and female).

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3.   The present study is confined to mathematics and engineering students.

MATERIALS AND METHODS

This present study was piloted at Aligarh Muslim University, Aligarh. It was planned to compare anxiety, depression and stress level of final year undergraduate students in respect of faculty and gender; it was also intended to study the relationship between anxiety, depression and stress. The investigator carried out this research as a quantitative investigation. This study is also characterised as correlation research as the investigator studied associations between anxiety, depression and stress (Geramian, Mashayekhi, & Ninggal, 2012).

PARTICIPANTS

In the present study, the population comprised of undergraduate students from Aligarh Muslim University, Aligarh, Uttar Pradesh. This study was conducted on a sample of 201 undergraduate students (103 science students & 98 engineering students; 102 male students & 99 female students) studying in the graduation final year at Aligarh Muslim University, Aligarh, Uttar Pradesh, India. The sample was drawn on a random basis. In this study, total male and female undergraduate students were taken into consideration.

PROCEDURE

The researcher personally visited the departments and Women's college at Aligarh Muslim University, Aligarh after getting permission from the respective chairpersons and principal. The objectives of the study were clarified to students. A respectable bond was established to obtain accurate responses from the participants through a short dialogue. They were assured that their information will be used only for research purpose and will be kept in confidence. They were instructed to fill out the questionnaire as it was elucidated in the manual of the tool itself.

MEASURES

The revised scale (ADSS; BSPSA, 2018) was used to measure anxiety, depression and stress. It comprised of 48 items divided into 3 subscales, anxiety subscale (19 items), depression subscale (15 items) and stress subscale (14 items) scored on a 2-point scale 1 (*yes*) and 0 (*no*). Endorsement percentage in 45 questions (out of 48 items) was above 25%. Hence all 48 items were retained. Reliability of the scale as measured by Cronbach's alpha and Spearman-Brown coefficient is 0.81 and 0.89.

DATA ANALYSIS

The study investigated the relationship between anxiety, depression and stress of undergraduate final year students. It was also planned to compare anxiety, depression and stress level of students in terms of faculty and gender. SPSS software version 20.0 was used to analyse the findings. Pearson product moment correlation (r) and multivariate analysis of variance (MANOVA) were employed to compute data.

RESULTS AND INTERPRETATION

Table 1: Correlation matrix of anxiety, depression and stress

Variables	Anxiety	Depression	Stress
Anxiety	1	.431**	.490**
Depression		1	.539**
Stress			1

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

It is clear from the table 1 that there exists a significant relationship between anxiety and depression (r=.431, p< 0.01), anxiety and stress (r= .490, p< 0.01) and depression and stress (r= .539, p< 0.01) so, H_01 is rejected, it means that there is a significant positive relationship between the said groups.

Table 2: To find out the difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Wilks' Lambda	.134	420.973[b]	3.000	195.000	.000	.866
Faculty	Wilks' Lambda	.910	6.417[b]	3.000	195.000	.000	.090
Gender	Wilks' Lambda	.926	5.193[b]	3.000	195.000	.002	.074
Faculty* Gender	Wilks' Lambda	.986	.920[b]	3.000	195.000	.432	.014

a.   Design: Intercept + faculty + Gender + Faculty* Gender
b.   Exact statistic
•   Computed using alpha = 0.05

A two-way MANOVA revealed a significant multivariate main effect of faculty on the combined dependent variables anxiety, depression and stress, Wilks' λ = .910, $F(3, 195) = 6.417$, p = .000, partial η^2 = .090. There was a significant multivariate main effect of gender on the combined dependent variables anxiety, depression and stress, Wilks' λ = .926, $F(3, 195) = 5.193$, p = .002, partial η^2 = .074. There was a non-significant multivariate interaction effect of faculty and gender on the combined dependent variables anxiety,

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depression and stress, Wilks' λ = .986, F(3, 195) = .920, p = .432, partial η^2 = .014.

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Anxiety	111.681[a]	3	37.227	4.862	.003	.069
	Depression	157.120[b]	3	52.373	5.824	.001	.081
	Stress	27.556[c]	3	9.185	.926	.429	.014
Intercept	Anxiety	6776.991	1	6776.991	885.025	.000	.818
	Depression	7095.308	1	7095.308	788.988	.000	.800
	Stress	8426.485	1	8426.485	849.338	.000	.812
Faculty	Anxiety	32.930	1	32.930	4.300	.039	.021
	Depression	59.503	1	59.503	6.617	.011	.032
	Stress	2.091	1	2.091	.211	.647	.001
Gender	Anxiety	71.124	1	71.124	9.288	.003	.045
	Depression	101.343	1	101.343	11.269	.001	.054
	Stress	18.454	1	18.454	1.860	.174	.009
Faculty* Gender	Anxiety	4.526	1	4.526	.591	.443	.003
	Depression	.592	1	.592	.066	.798	.000
	Stress	8.036	1	8.036	.810	.369	.004
Error	Anxiety	1508.508	197	7.657			
	Depression	1771.606	197	8.993			
	Stress	1954.483	197	9.921			
Total	Anxiety	8419.000	201				
	Depression	8974.000	201				
	Stress	10390.000	201				
Corrected Total	Anxiety	1620.189	200				
	Depression	1928.726	200				
	Stress	1982.040	200				

a. R Squared = .069 (Adjusted R Squared = .055)
b. R Squared = .081 (Adjusted R Squared = .067)
c. R Squared = .014 (Adjusted R Squared = -.001)
Computed using alpha = 0.05

Estimated Marginal Means

Dependent Variable	Faculty				Gender			
	Science		Engineering		Male		Female	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Anxiety	6.216	.273	5.406	.280	5.216	.274	6.406	.278
Depression	5.401	.295	6.490	.303	5.235	.297	6.657	.302
stress	6.378	.310	6.582	.318	6.176	.312	6.783	.317

There was a significant multivariate main effect of faculty on the combined dependent variables anxiety, depression and stress, Wilks' λ = .910, F(3, 195) = 6.417, p = .000, partial η^2 = .090. Further a separate ANOVA was conducted for each dependent variable, there was a significant univariate main effect of faculty on anxiety, F(1, 197) = 4.30, p = .039, partial η^2 = .021 with science students (M = 6.216) having a greater anxiety level than engineering students (M = 5.406). There was a significant univariate main effect of faculty on depression, F(1, 197) = 6.617, p = .011, partial η^2 = .032, with engineering students (M = 6.490) having a higher depression level than science students (M = 5.401). There was a non-significant univariate main effect of faculty on stress, F(1, 197) = .211, p = .647, partial η^2 = .001. But engineering students (M = 6.582) had a bit higher stress level than science students (M = 6.378).

There was a significant multivariate main effect of gender on the combined dependent variables anxiety, depression and stress, Wilks' λ = .926, F(3, 195) = 5.193, p = .002, partial η^2 = .074. Follow-up univariate ANOVAs indicated that there was a significant univariate main effect of gender on anxiety, F(1, 197) = 9.288, p = .003, partial η^2 = .045, with females (M = 6.406) having a higher anxiety level than males (M = 5.216). There was a significant univariate main effect of gender on depression, F(1, 197) = 11.269, p = .001, partial η^2 = .054, with females (M = 6.657) having a higher depression level than males (M = 5.235). There was a non-significant univariate main effect of gender on stress, F(1, 197) = 1.860, p = .174, partial η^2 = .009. But females (M = 6.783) scored a bit higher on stress than males (M = 6.176).

There was a non-significant multivariate interaction effect of faculty and gender on the combined dependent variables anxiety, depression and stress Wilks' λ = .986, F(3, 195) = .920, p = .432, partial η^2 = .014. However, the multivariate interaction effect is not statistically significant, one can look at univariate tests of main effects but should not examine univariate interaction effects (Leech, Barrett & Morgan, 2015).

DISCUSSION AND CONCLUSION

The present research is an earnest attempt to find out the difference in anxiety, depression and stress of undergraduate students in terms of faculty and gender. The results of the present study showed that there was a significant association between anxiety, depression and stress of undergraduate students. There was a significant multivariate main effect of faculty on the combined dependent variables anxiety, depression and stress. There was a significant univariate main effect of faculty on anxiety. Science students had a higher anxiety level than engineering students. It may be because of less security in job opportunities among science students. There was a significant univariate main effect of faculty on depression. Engineering students had a higher depression level than science students. It may be as a result of a long phase of workload among engineering students. There was a non-significant univariate main effect of faculty on stress, but engineering students had a bit higher level of stress than science students. There was a significant multivariate main effect of gender on the combined dependent variables anxiety, depression and stress. There was a significant univariate main effect of gender on anxiety and depression. Females had higher scores on anxiety and depression than males. It may be caused by their keen perception of trauma, hurt, risk, sexual harassment and child abuse. There was a non-significant univariate main effect of gender on stress, but females scored a bit higher on stress than males. There was a non-significant multivariate interaction effect of faculty and gender on the combined dependent variables anxiety, depression and stress. The results are almost similar to other studies; there was a positive association between anxiety, depression and stress (Rathnayake & Ekanayaka, 2016). Females exhibited more anxiety, depression and stress level (Singh, Goel, Sharma, & Bakshi, 2017; Wani et al., 2016; Apóstolo, Figueiredo, Mendes, & Rodrigues,

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2011). Females have more anxiety, depression and stress level because they are more likely to experience sexual assault and child abuse (Tolin & Foa, 2006). Females had a greater threat for posttraumatic stress disorder (PTSD), due to their stronger perceptions of threat and loss of control (Olff, Langeland, Draijer, & Gersons, 2007). The pleasant and progressive environment should be provided to both science and engineering undergraduate students irrespective of gender so they may be guided and assisted regularly. They must have access to counselling with no trouble. Preference should be given to female students because they have a higher risk for these syndromes. It is desirable that teachers and guardians must observe the students to motivate and energise them to cope up with life challenges in the perspiring era.

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