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Original Research

Examination Anxiety and Its Association With Socio-Demographic Variables Among Adolescent Students in Nepal

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Abstract

Examination anxiety is a combination of physiological, over-arousal, tension, and somatic symptoms along with worries, dread, fear of failure, and catastrophizing that occurs before or during the examination and is a major problem for students. Therefore, this study aims to assess the level of examination anxiety and its association with their selected socio-demographic variables among adolescent students in secondary schools in Nepalgunj, Nepal. A cross-sectional design was used, and 150 adolescent students were selected from selected secondary schools using a simple random sampling technique. The multinomial logistic regression (MNLR) model was adopted to assess the statistically significant factors associated with examination anxiety. Among 150 adolescent students, only 7.3% had no anxiety, more than half (i.e., 54.0%) had healthy anxiety, and 38.7% had unhealthy anxiety. The fitted MNLR model reveals that male students are 1.21 times more likely to have healthy examination anxiety than female students as a reference to no anxiety. Furthermore, the students whose parents expect high scores are 3.25 times more likely to have healthy anxiety than those whose parents do not expect high scores as a reference to no anxiety. The research reveals that male students have higher levels of examination anxiety than female students, and students whose

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parents expect an excellent score are more likely to experience healthy anxiety than students whose parents do not expect a high score.

Keywords: *Adolescent students, Multinomial logistic regression, Adjusted odds ratio, Confidence interval*

Introduction

Anxiety is defined as an unpleasant effect characterized by physiological, psychological, and behavioral changes in response to an intrapsychic conflict. Most people can relate to feeling tense, uncertain, and possibly fearful at the thought of things like sitting for an examination, going to the hospital, attending an interview, or starting a new job they may worry about uncomfortable (Subedi, 2016). Anxiety disorders may be caused by environmental factors, medical factors, genetics, brain chemistry, substance abuse, or a combination (Rehman, 2016).

Examinations are part of any educational system across the globe. Examination always brings a sense of fear or anxiety to the mind of students of all ages. The anxiety associated with examination can be termed 'examination anxiety.' Examination anxiety is a physiological condition in which people experience extreme stress and discomfort during or before an examination (Vaishnav & Dhoble, 2016). That is why examination anxiety is a combination of physiological, over-arousal, tension, somatic symptoms, worries, dread, fear of failure, and catastrophizing that occur before or during examination (Manchanda et al., 2018).

Examination anxiety is the mental distress and fears experienced by students when they have to face examinations of any type (or) any of its related activities (Ahsan & Kumar, 2016). Examination anxiety is a psychological condition, and it is a common problem among secondary students who experience extreme distress and anxiety in testing situations, which leads them to excessive tension and depression. Therefore, an unpleasant emotional state occurs in a formal test or evaluation (Alam & Halder, 2018; Goswami & Roy, 2017; Rani, 2017).

The World Health Organization defines adolescence as the period of life spanning 10 to 19 years, a unique and formative time (as cited in Bhandari, 2017). For students, adolescence is the most critical period of life, characterized by innumerable and unique but many problems. Students face many challenges due to globalization and high

competition in the global market, leading to unexpected behaviors. Expectations and pressure on themselves, peer groups, and parents for excellent performance make them more vulnerable. Sometimes, it is also experienced that owing to excess fear of exams, they forget everything and cannot do the exam well and, as a result, commit suicide (Oladipo & Ogungbamila, 2013).

The secondary level is a milestone in the academic life of any student and a landmark in school life. During this period, the students become adolescents, worried about their academic performance, anxious about their academic output, under great parental pressure to get high marks and face many changes physically as well as mentally, and have to make crucial decisions about future career selection (Miri et al., 2013; Qudsyi & Putri, 2016).

A study by Bashir et al. (2019) found that examination anxiety and depression were highly correlated. Furthermore, it was found that a high level of both examination anxiety and depression are highly correlated with each other among students. According to Gupta (2018), the findings revealed a significant effect of examination anxiety on the student's educational achievement; also, low-achiever students have more examination anxiety than high-achiever students.

Examination anxiety became a universal phenomenon because of the high stakes of the study curriculum, intense exam competition, and parental high expectations towards grades.

Akurathi and Raju (2019) state that secondary grade students' examination anxiety impacts their academic achievement with various demographic variables like gender, age, and mode of school. Furthermore, examination anxiety is one factor responsible for students' underachievement and low performance. When examination anxiety increases, academic performance decreases. Low exam anxiety negatively correlates with academic achievement and good grades, but low or medium exam anxiety increases academic achievement more than high exam anxiety.

Globalization and competition in the market have increased examination anxiety among students. It is very common to have some examination anxiety to perform better, but too much anxiety is really harmful. The students of this grade are very immature adolescents who sometimes find it difficult to cope with examination anxiety (Chowdhury, 2019).

Previous literature shows that students become anxious just before exams for various reasons, such as parents' expectations, peer pressure, poor preparation, and fear of failing. Thus, examination anxiety is a growing problem for most secondary school students. The problem of examination anxiety is not only in Nepal but also worldwide. This study, therefore, aims to assess the level of examination anxiety and its association with their selected socio-demographic variables among adolescent students in secondary schools of Nepalgunj, Banke, Nepal.

The study addresses the following research questions:

- What is the distribution level of examination anxiety among adolescent students?
- What is the association between the level of examination anxiety and their selected socio-demographic variables?

The following hypothesis was formed:

H_1: There is an association between levels of examination anxiety among adolescent students with their selected demographic variables.

Methods and Materials

A cross-sectional research design was adopted, and the study was conducted by applying a random sampling method in the selected secondary schools of Nepalgunj, Banke, in December 2020. Nepalgunj is a sub-metropolitan city in Banke District, which is located in Lumbini province, and the study population comprised all the students who were studying in grades 11 and 12 in Nepalgunj, Banke. A sample of 150 students was selected using a simple random sampling technique. Respondents are interviewed to collect data using a paper-based questionnaire.

The tools developed and used for data collection consist of two parts:

Part I: Proforma to collect socio-demographic data.

Part II: The tool consists of a standardized Test Anxiety Questionnaire, i.e., Likert's scale developed by Nist and Diehl (1990), to determine the level of students' test anxiety.

Furthermore, the tool, which consisted of socio-demographic data and the Likert scale, consisted of 15 and 10 items (statements or questions), respectively. Examination

test anxiety questionnaires (statements) were marked on a 5-point Likert scale: never, rarely, half-time, often, and always. Each of these questions was equally scored; the response options ranged from 1 (never) to 5 (always), the total score ranged from 10 to 50 points, and a higher score indicated an unhealthy level of test anxiety. Participants who obtained a total score between 10 to 19 were classified as having "no anxiety", those with a total score between 20 to 35 were classified as having "healthy anxiety," and those with a total score over 35 were classified as having "unhealthy anxiety".

In this research, the internal consistency and reliability of each set of items for the test anxiety questionnaire were evaluated using Cronbach's alpha test. The reliability coefficients of this research were 0.779 for the scale of the test anxiety questionnaire. Thus, the scale of this research was reliable as alpha coefficients in the range of 0.70 and above (Robinson et al., 1991).

The collected data were entered and analyzed using IBM-Statistical Package for Social Sciences (SPSS version 21.0). Descriptive statistical measures such as mean, standard deviation (i.e., mean $\pm$ standard deviation) for continuous variables and frequencies, and percentages were computed for categorical variables. Also, frequency distribution and percentages were performed using frequency tables. Initially, bivariate analysis was performed between the dependent variable (i.e., Level of examination anxiety) and each of the independent variables (i.e., Socio-demographic variables) to identify important candidate variables for multinomial logistic regression (MNLR) analysis.

The chi-square test or Fisher's exact test, wherever applicable, was used to find the association between two categorical variables; then MNLR model was used to investigate the significant socio-demographic factors (predictor variables) associated with the level of examination anxiety. Adjusted odds ratio (AOR) with their corresponding 95% confidence intervals; (AOR, with 95% C.I.) was reported. As the aptness of the MNLR model is evaluated by Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), -2log likelihood, likelihood ratio test, goodness of fit, pseudo R-square (Field, 2013)**,** for the test of model adequacy, -2log likelihood, likelihood ratio test, and Pseudo R-square test were applied. Finally, if variables with P-value < 0.05 as a level of significance were considered statistically significant for a two-tailed test otherwise insignificant. Although the dependent variable (i.e., Level of

examination anxiety categories) is ordinal in nature, MNLR model has been used instead of the ordinal logistic regression model as the results of the test of parallel lines show the null hypothesis that the slope coefficients in the model are same across the response categories ($P < 0.05$), and the model rejected. Therefore, the ordinal logistic regression model doesn't suit for modeling this study (The results of the test of parallel lines: 2log Likelihood = 206.121, chi-square = 47.826, $P = 0.014 < 0.05$).

The multinomial logistic regression (MNLR) model was used after verification of the validity of the fitted model by applying different model adequacy tests. The categories of the outcome variable (i.e., Level of examination anxiety), Y, are coded as 1, 2, and 3 for no anxiety, healthy anxiety, and unhealthy anxiety, respectively, and contrast category 1 versus 2 and 3 versus 2. The missing contrast between categories 1, 3 can easily be obtained in terms of the other two. Since

$$\ln\frac{\pi_{i1}}{\pi_{i3}} = \ln\frac{\pi_{i1}}{\pi_{i2}} - \ln\frac{\pi_{13}}{\pi_{i2}}$$

Let, $Y_{ij} = \begin{cases} 1, & \text{if the individual fall in category } j \\ 0, & \text{otherwise.} \end{cases}$ Where, j = 1, 2, 3.

Let, $\pi_{ij} = \Pr(Y_{ij} j|X)$, denote the probability that $Y_{ij} = j$

Assuming that the response categories are mutually exclusive, it can be written as

$$\sum_{j=1}^{3} \pi_{ij} = 1$$

The model for π_{ij}, in particular, where their probabilities depend on a vector X_k of covariates associated with the i^{th} individuals.

$$\ln\frac{\pi_{ij}}{\pi_{i1}} = \ln\frac{P(Y_{ij} = j|X)}{P(Y_{i1} = 1|X)} = \alpha_j + \sum_{k=1}^{g}\beta_{jk}X_k$$

Where j = 2, 3 and α_j, is a constant, β_{jk}, is the regression coefficient for j = 2, 3 and X_k (k=1, 2, …, g) are explanatory variables.

The MNLR model may also be written in terms of probability π_{ij},

$$\pi_{ij} = \frac{e^{\alpha_j + \sum_{k=1}^{g}\beta_{jk}X_k}}{1 + e^{\alpha_j + \sum_{k=1}^{g}\beta_{jk}X_k}}$$

Estimation of the parameters of this MNLR model is done by iteratively reweighted least square, which is identical to the logarithm of Fisher scoring or Newton-Raphsons. It leads to maximum likelihood estimates (McCullagh & Nelder, 1989)**.**

Results

The findings have been organized and presented under the following sections:

Section A: Distribution of Level of Examination Anxiety Among Adolescent Students

Table 1

Frequency and Percentage Distribution of Level of Examination Anxiety Among Adolescent Students

S.No.	Level of anxiety	Range of score	Frequency (%)
1	No anxiety	10-19	11 (7.3%)
2	Healthy anxiety	20-35	81(54.0%)
3	Unhealthy anxiety	>35	58(38.7%)

Minimum score = 10 Maximum score = 50

Table 1 depicts the level of examination anxiety among 150 adolescent students. Out of 150 students, only 11 (7.3%) had no anxiety, i.e., mild anxiety (having a score between 10-19); more than half of the students (81, 54.0%) had healthy anxiety, i.e., moderate anxiety (having score between 20-35) and 58 (38.7%) had unhealthy anxiety i.e., severe anxiety (having score more than 35) as shown in figure 1. The overall mean score of respondents on examination anxiety was 29.446 ± 7.582 points.

Section B: Association Between Level of Examination Anxiety and Their Socio-Demographic Variables

The results from Table 2, as p-value (P <0.05), there was a statistical association between the level of examination anxiety with their selected socio-demographic variables such as gender, parents' expectation for a high score, reading only at the time before examination, peer group competition and types of anticipatory guidance at 5% level of significance. Considering all these five statistically associated variables as candidate variables for multinomial logistic regression (MNLR) through a stepwise selection procedure, the final MNLR analysis came up with two significant predictor variables in association with the examination anxiety category, namely gender and parent expectation for high scores as shown in table 3. Gender; Male students were 1.216 times more likely (AOR = 1.216, 95% CI: 0.322–4.589, P = 0.036 < 0.05) to have healthy examination anxiety than female students as a reference to no anxiety. Furthermore, parent expectation; the students whose parents expected high scores were 3.258 times more likely (AOR = 3.258, 95% CI: 1.806–7.128, P = 0.031 < 0.05) to have healthy anxiety as compared to those students whose parents had no expectation for high scores as a reference to no anxiety as it is presented in Table 3.

From T-test as p-value < 0.05, there was statistically significant mean difference in test anxiety scores among the adolescent students at secondary school in relation to their gender (male and female). Further, it concluded male adolescent students had higher mean anxiety scores than females, as it is in Table 4.

Table 2

Association Between Levels of Examination Anxiety With Their Selected Socio-Demographic Variables

S.N.	Socio-demographic variables		Level of anxiety			Chi-square (χ^2)/Fisher's Exact	P-value
			No anxiety (%)	Healthy anxiety (%)	Unhealthy anxiety (%)		
1	Age	15	0	1	6		
		16	3	17	14	-	-
		17	5	27	19		
		18	3	22	10		

		19	0	14	9		
2	Gender	Male	7	52	21		
		Female	4	29	37	11.146	0.004
3	Religion	Hinduism	10	70	54		
		Muslim	0	5	1	7.022	0.577
		Christian	1	5	2		
		Buddhist	0	1	0		
		Others	0	0	1		
4	Residence	Urban	9	56	44		
		Rural	2	25	14	1.270	0.552
5	Education status of parents	Illiterate	0	7	2		
		Literate	11	74	56	1.571	0.387
6	Family income	Below Rs10000	0	1	1	5.595	0.464
		10000-20000	2	10	10		
		20000-30000	7	32	20		
		More than 30000	2	38	27		
7	Parents expectation	Yes	11	73	48		
		No	0	8	10	10.065	0.019
8	Reading only at the time Before examination	Yes	6	30	22		
		No	5	51	36	7.815	0.048
9	Peer group competition	Present	10	67	40	4.877	0.033
		Absent	1	14	18		
10	Time spent for study	1-2 hours	1	15	7		
		2-4 hours	2	36	24	7.823	0.226
		4-6 hours	7	18	17		
		Above 6 hours	1	12	10		

11	Leisure activities	Reading books	8 3	18 38	12 25		
		Use of internet	0	6	9	14.789	0.090
		Household& social activities	0 0	8 9	8 4		
		watching movies & TV	0	2	0		
		Playing game					
		Others					
12	Anticipatory guidance	Yes	8	75	47	5.903	0.052
		No	3	6	11		
13	Types of Anticipatory guidance	Need sleep & rest	0 0	20 12	`12 5	13.055	0.014
		Enough dietary intake	4	5	4		
		Create electronic media free	2 2	9 29	8 18		
		Create quiet &calm					
		Maximum time for studying					

(Source**:** Field visit 2020)

Table 3

Significant Predictor Variables in Association With Level of Examination Anxiety Category in Fitted MNLR Model

Anxiety category	Variables	Category	B	P-value	AOR (95% CI)
Healthy anxiety	Intercept		8.349	0.001	-
	Gender	Male	0.196	0.036	1.216 (0.322 – 4.589)
		Female		Reference	
	Parent expectation	Yes	1.625	0.031	3.258 (1.806 - 7.128)
		No		Reference	
Unhealthy anxiety	Intercept		3.472	0.006	-
	Gender	Male	-0.958	0.196	0.384 (0.098-1.592)
		Female		Reference	
	Parent expectation	Yes	-1.593	0.263	0.278 (0.039-2.862)
		No		Reference	

Model Fitting Information:

Chi-square = 28.203; P = 0.000 < 0.0001, -2 Log Likelihood = 35.403, Pseudo R-square: (Cox and Snell = 0.120, Nagelkerke = 0.144, McFadden = 0.074)

Test of Goodness of Fit of the MNLR Model:

Table 3 (i)

Test of the Goodness of Fit

	Chi-Square	d.f.	P-value
Pearson	1.501	2	0.661
Deviance	1.936	2	0.369

The reference category is: No anxiety

Deviance and Pearson's chi-square judge the overall goodness of fit of the estimated model. In the above table 3 (i), both Pearson and Deviance residuals are statistically

non-significant (as P-value > 0.05) at 5% level of significance which suggests that the estimated model fit is well to the multinomial logistic regression (MNLR) model.

Table 4

T-test *for Significance of Mean Difference in Test Anxiety Scores of Adolescent Students (11th and 12th Grade Students) on the Basis of Gender*

Gender	n	Mean	Std. Dev.	Std. Error	95% CI	P-value (Two tailed)	P-value (One tailed)
Male	80	31.414	7.828	1.2851	28.513 - 35.175	0.0137	0.0068
Female	70	27.725	6.962	0.9356	26.346 - 32.786		

Discussion

This study assessed the level of examination anxiety among adolescent students in Nepalgunj. This part deals with the results obtained from the statistical analysis based on the data of the study. The results obtained from this study could help with future strategies to reduce examination anxiety among adolescent students.

In this study, out of 150 students, the respondents' mean score on examination anxiety was 29.446 ± 7.582 points. Overall, only 7.3% had no anxiety, more than half of the students (54.0%) had healthy anxiety, and 38.7% had unhealthy anxiety. These findings were in keeping with the results from various studies: such as the study conducted in Indonesia in 2016 in which a sample of 102 students of 12 grades, 27.45% had mild, 46.0% of them had moderate, and 17.65% of them had a severe level of examination anxiety (Qudsyi & Irma, 2016). The study conducted in Kokrajhar District, Assam, India, showed 46.33% high, 36.67% normal, and 17% low-level test anxiety among students (Goswami & Roy, 2017). In another study in Nagpur city, the state of Maharashtra, India, with adolescents of age group 13-18, 48.55% had a very high level of anxiety, whereas 37.53% had moderate and 12.94% had a low level of anxiety (Vaishnav & Dhoble, 2016). The study in Minicoy Island presented that 32% had low anxiety, 42% had average anxiety, and 26% had high anxiety (Mahato & Jangir, 2012). Similarly, the study conducted in Tirunelveli district, India, presented

that 24.7% of higher secondary students have low, 49.3% have moderate, and 26.0% have high test anxiety (Lawrence, 2014). The variations in results might be attributed to differences in study area, scale of classification, and categories of enrolled subjects.

In the present study, the fitted MNLR analysis revealed that gender and parent expectation for high scores were significant predictor variables associated with examination anxiety. Gender; Male students were 1.216 times more likely (AOR = 1.216, 95% CI: 0.322– 4.589, P = 0.036 < 0.05) to have healthy examination anxiety than female students as a reference to no anxiety. Also from T-test, it revealed that male adolescent students had higher mean anxiety scores than females. These findings were almost consistent results with the study in Dang district, Nepal, in which male students were 1.520 times more anxiety than females (AOR = 1.520, 95% CI: 1.040–2.222, P = 0.031 < 0.05) from multivariate logistic regression analysis (Bhandari & Adhikari, 2015).

The findings of this study were almost comparable with the previous study conducted in Sudan in which females were of lower possibility to develop high examination anxiety in comparison to males who had 2.502 times higher odds of having high test anxiety (OR = 2.501, 95% CI: 1.894 - 2.988, P = 0.031 < 0.05) (Bashir et al., 2019)

Furthermore, parent expectation; the students whose parents expectations for high scores were 3.258 times more likely (AOR = 3.258, 95% CI: 1.806 – 7.128, P = 0.031 < 0.05) to have healthy anxiety as compared to those students whose parents did not expect high scores as a reference to no anxiety (from table 3).

The limitations of this study included the following:

- The size of the sample was only 150, so it was not large enough to make it a representative sample.
- The study was limited to students studying in 11th and 12th grade of selected secondary schools, Nepalgunj.

Conclusion

From the above findings and discussion of this study, it can be inferred that male students have higher levels of examination anxiety than female students, and students whose parents expect excellent scores are more likely to have healthy anxiety than

students whose parents do not expect high scores. An orientation to male students for reducing their examination anxiety is needed to be provided, and parents must not put more pressure on their children for their expectation of high scores. The majority of the students possess high examination anxiety, which indicates a negative effect of the modern education system and needs immediate attention and prevention. Examination anxiety could be reduced considerably by providing a suitable environment and encouraging them for studies so that they can prepare well. Not only guardians but teachers also have a role to play in reducing exam anxiety. Parents and teachers try to understand their children's physical conditions, mental status, and psychological needs, which may play a positive role in dealing with exam anxiety.

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