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Sources of perceived academic stress (PAS) of online examination in graduate and postgraduate Indian students post COVID-19 pandemic

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Abstract---Background: Academic stress is the major cause of stress in graduate and post graduate students and is a concern for mental health problems in students. Perceived academic stress may occur in response to examination .Covid-19 caused a paradigm shift from offline to online teaching-learning and examination .The online mode of examination may lead to variation in perceived academic stress of examination in graduate and post graduate Indian students. The perceived academic stress response to online mode of examination post covid-19 and the factors leading to it have not been identified. Aim and objectives : To find the level of perception of academic stress of online examination in graduate and post graduate Indian students post covid19 and identify the major factors leading to perception of academic stress. The objective was to identify the variation in perceived academic stress in response to online examination in graduate and post graduate students and study the corelation between demographic variables and perceived academic stress in both graduate and postgraduate students . Study design: A cross sectional study. Methods and Material: Step 1 was to create a google form (basic

demographic data and perception of academic stress scale). A cross sectional survey was conducted and simple random sampling method was used to collect data .The google form was mailed to around 660 graduate and post graduate students all over India, out of which 637 graduate and post graduate students filled the form and responded . Statistical Analysis used : Measure of the association for categorical data set was analysed using the Chi-Square test.Principal components of analysis for factor loading and purpose of separation of factors was used and we used KMO Test and Barellet test . Results : 84.8% students experienced moderate perception of academic stress and pressures to perform was identified as the highest source of academic stress followed by perceptions of examination and career, self-perceptions ,time constraint and competition .Conclusions : Hence ,it is important to conduct occupational therapy programs to orient the students to use adaptive coping methods and relaxation therapy to cope with the perceived academic stress of examination post-Covid-19.

Keywords---COVID-19, examination, graduate students, perception academic stress, postgraduate students, occupational therapy.

Introduction

Stress is defined as any challenge experienced to the body 's internal balance[1] .Stress in graduate and postgraduate students can occur both due to academic and non-academic factors such as socio-cultural, psychological, and environmental[2]. Stress is an interaction between environmental stressors, appraisal of students, and reactions in response to them[3]. Academic factors are the most common cause of stress in the majority of students followed by physical, social, and emotional factors [4] .Academic stress is the major cause of mental health concerns in India [3]. Covid-19 pandemic created depression, stress, and anxiety in Indian adults[5]. In previous studies the most reported factors contributing to exam anxiety have been found as extensive course loads in 90.8 percent students ,lack of physical exercise in 90 percent and long duration of examination in 77.5%[6] .The five main stressors of exam stress in descending order included taking tests, the student's own aspirations ,learning tasks followed by teacher 's and parental aspirations[7] . Other sources of students perceived academic stress of his own self perceptions include factors related to personality characteristics, intelligence, their past academic achievements and other academic environmental and psychosocial sources[4] . The study by Yumba (2010) found that academic sources of stress appeared to be the most stressful for students in which pressure of course and evaluation methods for academics were found to be highly stressful[8]. The Covid-19 caused a shift from offline to online mode of teaching-learning and examination. However ,the factors leading to perception of academic stress of examination in graduate and post graduate Indian students post-covid 19 which changed the complete learning method to online teaching and assessment ,have not been examined and this has led to lack of awareness among students on using appropriate coping methods for it and high impact on the mental health of students.

Hence it was need to conduct a study to identify the level of perception of academic stress post covid-19 and the predominant factors leading to perception of academic stress in graduate and postgraduate students which can be later controlled and monitored to prevent mental health problems . In future the study findings can help to guide the students to use adaptive coping methods to reduce the level of perceived academic stress and prevent the occurrence of mental health problems in graduate and post graduate students in India .

Subjects and Methods

It was a cross-sectional survey conducted on graduate and post graduate students studying for online examination post covid-19 in colleges all over India (Northern ,Eastern, Western ,Southern and Eastern India). The sampling frame consisted of 637 total graduate and post graduate students from all colleges of northern ,eastern,western,southern and central India , by employing simple random sampling .The entire period of study was from July 2020 to October 2021 which included design of questionnaire . The study protocol was approved by the Institutional Ethics Committee. Consent was sought from the students for participation in the study .All four years graduate and post graduate students studying in colleges in India, NCR ;students who gave voluntary consent , students who were appearing for the examination and both male and female gender were included in the study and those who were already on psychiatric interventions and students with previous history of anxiety or depression were excluded from the study .Data collection was done in the form of general demographic data sheet and perception of academic stress scale (PAS-18 items) through online google form due to covid-19 restrictions . The general demographic sheet included data on Part of India(Northern,Eastern,Western,Southern and Eastern India ,gender(Male/female),Age group grouped as(20-22,23-25 ,26-28 ,29-31 and above 31 ,Education (Graduate ,Post-graduate),Type of course (Medical ,Non-Medical ,Engineer, Arts ,Others) and Type of family (Nuclear, Joint and Single parent). Perception of Academic stress scale is an 18 item scale used to measure perceptions of academic stress and its sources . The Perception of Academic Stress scale has 3 subscales mainly : (1) the academic expectations subscale which has 4 items (2) workload and examinations subscale has 8 items , and (3) students' academic self-perceptions subscale which has 6 items . The instrument has internal consistency reliability of 0.7 (Cronbach's alpha) [4] .As MS Access was easy to enter the data collected was downloaded in MS Excel sheets for analysis using SPSS 26 version . After collection of data of all the students the final analysis was done. The one-sample Kolmogorov – Smirnov test was employed to determine the total score (data did not follow normal distribution) non - normally distributed data analyzed using non parametric tests. Mean and standard deviation was calculated for qualitative total score variable and frequency and percentage for categorical socio demographical variables. Measure of the association for categorical data set was analyzed using the Chi-Square test.Principal components of analysis for factor loading and purpose of separation of factors was used and we used KMO Test and Barellet test .

Results

Of the total 637 graduate and postgraduate students , 494 (77.6%) belonged to the northern regions of India,68 (10.7%)belonged to Central ,38 (6%) to eastern,21(3.3%)to Southern and 16(2.5%) to western India . 436 (68.4%) students were female and 201(31.6%) were males. About 455(71.4%)students belonged to age group 20 to 22 years,131 (20.6 %) to 23-25 years,33(5.2 %)to 26-28 years , 8(1.3%)to 29-31 years age group and 10(1.6%)were above 31 years age . 550(86.3%)of students were graduates ,87(13.7%) were post graduates and 590(92.6%) belonged to medical courses. 371 (58.2%) of students were from nuclear families,218(34.2%)were from joint family and 48(7.5%) were from single parent in this study.

540 (84.8%) students had moderate perceived academic stress as observed on Perception of academic stress scale and the mean and standard deviation of perception of academic stress scale was 38.60 ± 8.798 as shown in Table 1.

Table 1: Frequency ,percentage distribution and Mean and Standard Deviation of perceived academic stress of Indian graduate and post graduate students due to COVID-19 Pandemic

Scale	Frequency (n=637)	Percent
Perception of Academic Stress Scale(PAS)		
Low	28	4.4
Moderate	540	84.8
High	69	10.8
Mean \pm SD(PAS Scale)	38.60 ± 8.798	

There was statistically significant association observed between perception of academic stress scale and demographic factors such as part of India ($p=0.001$); age ($p=0.001$) and no association with gender ($p=0.100$); type of course ($p=0.377$) and type of family ($p=0.076$) in graduate students. There was an association between perception of academic stress scale and part of India ($p=0.044$) and no association between gender; age; type of course and type of family in postgraduate students. The objective was to identify the factors leading to perceived academic stress of examination among graduate and postgraduate students due to Covid-19 pandemic.

Table 2 : Table of specification and Graduate students and Post graduate students' ratings of the Perception of Academic Stress scale(PAS)

S. No.	Perception of Academic Stress Scale (1=Strongly disagree to 5=Strongly agree)	Education (Mean \pm SD)	
		Graduate (n=550)	Post Graduate (n=87)
	Stresses related to academic expectations		
1	Competition with my peers for grades is quite intense	3.31 ± 1.197	2.99 ± 1.215
2	My teachers are critical of my academic	2.91 ± 1.112	2.93 ± 1.237

	performance		
3	Teachers have unrealistic expectations of me	2.49 ± 1.135	2.72 ± 1.291
4	The unrealistic expectations of my parents stresses me out	2.84 ± 1.312	2.52 ± 1.363
	Stresses related to faculty work and examinations		
5	The time allocated to classes and academic work is enough	2.99 ± 1.276	2.97 ± 1.146
6	The size of the curriculum (workload) is excessive	3.52 ± 1.229	2.92 ± 1.112
7	I believe that the amount of work assignment is too much	3.19 ± 1.240	2.92 ± 1.203
8	Am unable to catch up if getting behind my work	3.22 ± 1.169	3.08 ± 1.143
9	I have enough time to relax after work	2.57 ± 1.197	2.92 ± 1.260
10	The examination questions are usually difficult	3.01 ± 0.998	3.02 ± 0.976
11	Examination time is short to complete the answers	3.17 ± 1.197	3.31 ± 1.174
12	Examination times are very stressful to me	3.69 ± 1.166	3.20 ± 1.170
	Stresses related to students' academic self-perceptions		
13	Am confident that I will be a successful student	3.69 ± 1.068	3.67 ± 1.075
14	Am confident that I will be successful in my future career	3.82 ± 1.069	3.76 ± 1.067
15	I can make academic decisions easily	3.25 ± 1.091	3.30 ± 1.111
16	I fear failing courses this year	2.76 ± 1.324	2.67 ± 1.327
17	I think that my worry about examinations is weakness of character	3.00 ± 1.250	2.64 ± 1.191
18	Even if I pass my exams, am worried about getting a job	3.44 ± 1.281	3.46 ± 1.292
	Mean Percentage Score	63.16%	61.10%

The results of student's responses perception of academic stress scales (PAS) are summarized in Table 2. The internal consistency reliability (Cronbach's alpha) was 0.71 for the 18 items of the PAS. Results show after inspection that the level of academic sources of stress was reported the low range for most of the scales items by post graduate students. Overall, 63.16% graduate students and 61.10% post graduate students reported confidence in their academic performance and in their ability to succeed. In this study, Competition with my peers for grades is quite intense factor that had more Stresses related to academic expectations. The size of the curriculum (workload) is excessive, I believe that the amount of work assignment is too much, Examination time is short to complete the answers, Examination times are very stressful to me factors was agreed by students that they had Stresses related to faculty work and examinations. Am confident that I will be a successful student, am confident that I will be successful in my future career, I can make academic decisions easily, even if I pass my exams, am worried about getting a job, I think that my worry about examinations is weakness of

character factors was agreed by students that they had Stresses related to students' academic self-perceptions.

Factor analysis

Several exploratory principal component analyses were conducted on the 18-item scale. Value of KMO test (value>0.5) had 0.805 and Bartlett's Test are statistically significant ($P=0.001$), that mean factors are correlated to each other. Based on the Kaiser rule (Eigen values > 1), the percentage of variance accounted for factors, and the cohesiveness of the factors (i.e. patterns of loadings), a five factor solution appeared optimum. The five factors accounted for 56.515% of the variance in responses related to student's experiences of academic-related stresses, and the varimax rotation converged in five iterations. Three items in reducing out of 10 and 15 items were made 5 factors

Table 3: Rotated component matrix for the Perception of Academic Stress (PAS) scale

	Factor Loading				
	1	2	3	4	5
The examination questions are usually difficult	.706				
Examination time is short to complete the answers	.678				
I fear failing courses this year	.634				
I think that my worry about examinations is weakness of character	.574				
Examination times are very stressful to me	.555				
Am confident that I will be a successful student		.858			
Am confident that I will be successful in my future career		.836			
I can make academic decisions easily		.730			
Teachers have unrealistic expectations of me			.807		
My teachers are critical of my academic performance			.751		
The unrealistic expectations of my parents stresses me out			.514		
I have enough time to relax after work				.773	
The size of the curriculum (workload) is excessive				.670	
I believe that the amount of work assignment is too much				.569	
Competition with my peers for grades is quite intense					.667

Table 3 contains the factor loadings (value >0.5), the internal consistency reliability analysis, and the proportion of the observed variance for each factor.

Factor 1: Pressures to Perform - This component consists of five items and explains 14.558% of the observed variance. The factor refers to the excessive stresses from the items as examination questions are usually difficult;

Examination time is short to complete the answers; I fear failing courses this year; I think that my worry about examinations is weakness of character; and Examination times are very stressful to me.

Factor 2: Perceptions of Examinations and Career - This component consists of three items and explains 13.346% of the observed variance. The factor refers to stresses from items as Am confident that I will be a successful student; Am confident that I will be successful in my future career; and I can make academic decisions easily. Factor 3: Self-perceptions - This component consists of three items and having 10.863% of the observed variance. The factor refers to stress from items as Teachers has unrealistic expectations of me; my teachers are critical of my academic performance; and the unrealistic expectations of my parents stress me out.

Factor 4: Time restraint - This component consists of three items and explains 10.213% of the observed variance. The factor refers to stresses as a result of I have enough time to relax after work; the size of the curriculum (workload) is excessive; and I believe that the amount of work assignment is too much. Factor 5: Competition - This component consists of one item and explains 7.536% of the observed variance. The factor refers to stress as a result of Competition with my peers for grades is quite intense.

Fig 1 : Screen plot shows factor loading Eigen value and five factors

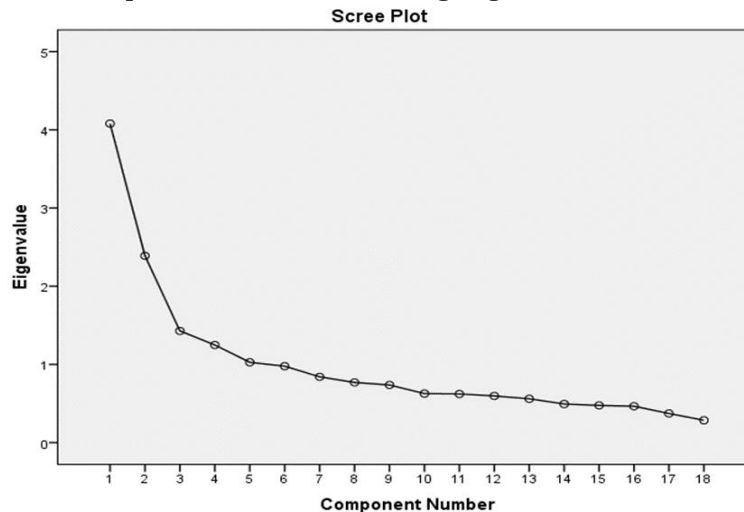


Figure 1 as shown above depicts factor loading eigen values and its correlation with the five factors.

Discussion

The objective of the study was to find the level of perception of academic stress of online examination in graduate and post graduate Indian students post covid19 and identify the major factors leading to perception of academic stress. After the cross-sectional survey it was observed that out of the 637 students, 540 (84.8%)

students had moderate perceived academic stress as observed on Perception of academic stress scale. These findings replicate from other study Bedwey (2015) where undergraduate and graduate students reported mild to moderate level of academic stress[4]. This is in accordance with study by Reddy K(2019) on sources of academic stress in university students is a major factor which impacts students mental health and wellbeing[3]. There were a statistical significant association between perception of academic stress scale and part of India ($p=0.001$); age ($p=0.001$) and no association with gender ($p=0.100$); type of course ($p=0.377$) and type of family ($p=0.076$) in graduate students. There was an association between perception of academic stress scale and part of India ($p=0.044$) and no association between gender; age; type of course and type of family in postgraduate students. Our objective was to identify the factors leading to perceived academic stress of examination among graduate and post graduate students due to COVID -19 pandemic .On factor analysis ,Perception of Academic stress scale factors were grouped into five broad categories in descending order of relation to perceived academic stress .Three factors were eliminated from the grouping which included -the time allotted to classes and academic work is enough ,the unrealistic expectations of my parents stress me out and even if I pass my exams ,I am worried about getting a job. Pressure to perform was identified as the highest source of perception of academic stress .These findings replicate in study conducted by Bedwey D(2015) where factors related to perceptions of academic stress were grouped into four constructs -pressures to perform accounted for 18 % of observed variance followed by perceptions of workload and examination 10 % of observed variance ,self-perception (9% of observed variance)and time constraints (which accounted for 8 % of observed variance)[4].The study identified that pressures to perform in exam was the predominant source of stress ,however pre-covid data was not available to rule out replication of same factor responsible for stress prior .The study did not do a long term longitudinal follow up to generalize the findings .These are the limitations of the study which can be overcome in future studies .Occupational therapy programs including active coping methods training and their effect pre and post perception of academic stress can be evaluated .

Conclusion

It was observed from the present study that 84.8 % graduate and post graduate students experienced moderate perception of academic stress of examination Post-Covid-19 .The pressures to perform in the examination was the highest source of stress for graduate and post graduate students .Hence ,it is important to conduct occupational therapy programs to orient the students to use adaptive coping methods and relaxation therapy to cope with the perception of academic stress of examination post-Covid-19 .

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Conflict of interest: No conflict of interest

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