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ORIGINAL ARTICLE

Association of Perceived Stress with Gender and BMI in students appearing in University Entrance Examination

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ABSTRACT

Background: Students have been found to report high levels of perceived stress in daily life. However, it exerts many effects on students' health and outcome or output in examinations results.
Aim: To determine the association of perceived stress with gender and body mass index (BMI) in students appearing in the university entrance examination.
Methods: It is a cross-sectional study was done to find out the association between variables. The total sample size was 498 (401 Female and 88 male) pre-medical and pre-engineering students with a mean age of samples were 18 (SD=±0.83) years. The purposive sampling technique was used to collect the student's data from aptitude training centers in Karachi from August to September 2021 by applying Sheldon Cohen's Perceived Stress Scale (PSS-10). Data was analyzed by using SPSS.
Results: There was a moderate stress level of perceived stress in students. The perceived stress was significantly associated with gender (<0.01), while no significant association between stress and BMI (>0.45).
Practical Implication: This study would be helpful for the parents and teachers to assess the mental health level (perceived stress) of their new generation, who are striving for a bright future. As to train them for positive coping with this stress and train them for dealing effectively with any worrisome circumstances effectively, as to prevent psychological distress and suicidal ideation in young people of society.
Conclusion: In this study moderate stress was observed and perceived stress was significantly associated with gender in our study participants.
Keywords: Coping, Perceived stress, perceived stress scale‑10, Students.

INTRODUCTION

Adolescence is considered the transition period between childhood and adulthood, during which biological, cognitive, emotional, and psychological transformations in the human body, in the brain, and in behavior occur. Students are a unique community group facing many stressful events in this period of life. As every student wants to achieve the aim in life by achieving higher studies, so everyone faces more tough subjects or syllabi, challenging projects, and assignments[1].

Stress is defined as the feelings or conditions experienced by an individual perceives the demands placed, that exceed the available resources" or it is the stress that is the subjective perception of an individual, or it is an imbalance perceived by the individual between demands encountered in daily living and capability to cope with people, or dreams, or expectations, so that body responds by producing various hormones like cortisol, serotonin, epinephrine, and norepinephrine or activation of various system like Autonomic nervous system, hypothalamic–pituitary-adrenal system and serotonin system (Physiological or biological responses) or by psychologically by the development of anxiety, depression, and stress, as to cope the changing stressors for regulation of the internal environment of the human body or maintenance of homeostasis. The stress (perceived or potential) is classified into positive (eustress) and negative forms (distress). Both forms of stress exert different effects on the human body[2,3]. Globally, the prevalence of depression is 10% and anxiety is 33% between the ages of 18 and 25 years[4]. Different results described the prevalence of stress in turkey (27%), the UK (45%), Nepal (20.9%), India (63.5%), Bangladesh (54%) and Malaysia (41%) mentioned in the study[5].

The stressors are classified into different categories like financial problems of higher education, social issues like marriages of girls or getting higher status in society, and academic pressure like getting admission to medical universities. Undergraduate Students of either gender are facing different types of stressors. These stressors are producing adverse effects on studies or on academic growth, well-being, or health, so ultimately they are causing mental distress with negative impacts on cognition and learning. If perceived stress is not managed properly or failure to cope with such situations, that leads to ultimately severe metabolic or systemic disorders or psychological disturbances. Body mass index (BMI) is one of the variables, which is influenced by stress (perceived or potential), due to the complex nature of the relationships and it is responsible for the development of hormonal imbalance or endocrinopathies, cardiovascular diseases (CVD), and malignancies[6].

Maladaptive eating behavior in students or in adolescents, is associated with eating unhealthy foods with less nutritional value and with increased use of high-fat diets or high sugar contained junk foods. The female gender is having different types of eating behaviors like consciously avoiding or limiting the intake of certain foods (restrained type), loss of control when eating certain foods (uncontrolled type), and over-consumption of food (negative emotional)[7]. These eating behavior are associated with the development of obesity or morbid obesity i.e., higher BMI, as compared to those students, who have no maladaptive eating behaviors[8]. The stress (perceived) is the internal feeling and is affected by these eating behaviors. The restrained type of maladaptive eating behavior is associated with a higher level of perceived stress[9]. The higher level of stress is also associated with loss of eating control during eating tasty foods or using junk foods or energy booster drinks[10].

Emotional eating behavior type is also associated with higher stress levels, so this exerts negative effects on the body mass index. These maladaptive eating behaviors have a temporal relationship between perceived stress, dietary risk and BM[11-13]. This research is the first of its types to assess the stress levels in students, as to assist parents and educators in managing perceived stress.

The purpose of this study is to evaluate the relationship between gender and body mass index with perceived stress in students. The objective of the study was to determine the association of perceived stress with gender and body mass index (BMI) in students appearing in the university entrance examination.

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METHODOLOGY

It is a descriptive cross-sectional study that was conducted in 2 months (August to September; 2021) after getting ethical approval from the Ethical & scientific review committee of Karachi Medical & Dental College, Karachi. Data was collected from students of higher secondary schools or of degree college students (pre-engineering or pre-medical) or A-level students in the science group, as these were doing preparation for entry tests in various tuition /aptitude training centers. The convenient sampling technique was used, by applying the online Raosoft sample size calculator, and was found to be 377 (95% confidence level and 5% margin of error) students were selected, but data was gathered from 498 participants, after taking written consent[14]. The students, who were taking antidepressants or anxiolytic drugs or had a history of any other psychiatric disease (depression) were excluded from this study.

The research questionnaire was handed over to all students, who were asked to submit it on the same day during class time. Cohen's Perceived stress scale was used to assess the degree or levels of stress in students.[15]This Cohen's Perceived stress scale has 10 items. The response was received on a 5-point Likert rating scale ranging from "0" never, ''1''almost never, ''2'' some times, ''3'' often, and "4" very often, and as 4, 5, 7, and 8 items are reversed with sum across and all 10 items with results of range 0 to 40. The higher Cohen's perceived stress scale, the greater will be the degree or level of perceived stress with a level of mental well-being and vice versa. The reliability and the validity of Cohen's scale vary from 0.78- 0.98 according to different researchers by applying Cronbach's alpha coefficient[15-17]. The Body mass index (BMI) was calculated as weight (kilogram) divided by height (meters square) or (kg/m2). It was categorized into underweight, normal weight, overweight & obesity[18]. Data were analyzed by using IBM-SPSS software, and version 23.0, Frequencies and percentages were used to find out the gender and perceived stress levels. An Independent sample t-test was used to find out the association of the mean Perceived Stress Scale (PSS) with gender. Pearson Chi-square was used to find out the association of Perceived Stress Scale (PSS) levels with gender. One-way ANOVA was used to find out the association between perceived Stress Scale (PSS) levels with body mass index (BMI). P-values less than 0.05 (≤0.05) were considered statistically significant.

RESULTS

A total of 489 students responded the research questionnaire, among these students 401(82%) were female and 88(18%) were males, with mean age of samples was 18±0.83 years, with mean Perceived Stress Scale (PSS) of participants was 21±10 and the ranges of perceived stress scores levels; a) there were 25.8% samples found moderate stress level with PSS score ranges between 0-13 units, b) there were 42.1% samples found moderate stress level with PSS score ranges between 14– 26 units, c) there were 32.1% samples found high-stress level with PSS score ranges between 27-40 units (Table-1 & pie-chart-1).

Table 1: Gender, age and perceived stress scale of studied samples (n=489)

Characteristics		**n**	**%age**
Gender of students	Male	88	18.0
	Female	401	82.0
Perceived Stress Scale (PSS)	Low (0-13)	126	25.8
	Moderate (14-26)	206	42.1
	High (27-40)	157	32.1
Age (Years)	Mean ±SD	*18±0.83*	
Perceived Stress Scale (PSS)	Mean ±SD	21±10	

The gender-based comparison showed a significant (p<0.05) association mean Perceived Stress Scale (PSS) (Table 2) and no significant (p>0.05) association was n observed between gender with levels (low, moderate & high) Perceived Stress Scale (PSS) (Table 3). The mean body mass index showed no significant (p>0.05) association with Perceived Stress Scale (PSS) levels (low, moderate & high) in our study participants (Table 4).

Figure 1: Levels of Perceived Stress Scale (PSS)

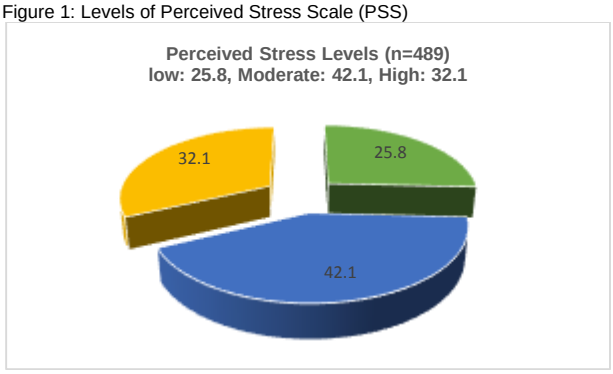

Table- 2: Association of mean Perceived Stress Scale (PSS) with gender (male & female).

Factors/	**Perceived Stress Scores (PSS)**	
Gender	**Mean**	**±SD**
Male	18	±9
Female	21	±10
P value was obtained using an Independent sample t-test.		

P value <0.01*

Table-3: association of Perceived Stress Scale (PSS) levels with gender.

Characteristics	**Description in words**		
Gender	**Low Stress (n=126)**	**Moderate Stress (n=206)**	**High Stress (n=157)**
Male	27(21.4%)	42(20,4%)	19(12.1%)
Female	99(78.6%)	164(79.6%)	138(87.9%)
P value was obtained using Pearson Chi-square.			

P value 0.06

Table-4: Association of Perceived Stress Scale (PSS) levels with BMI.

Perceived Stress Score (PSS)	**PSS**	**BMI - Mean (±SD)**
Low Stress 0-13	126(25.8%)	24.9 (±5.7)
Moderate Stress 14-26	206(42.1%)	25.2 (±5.3)
High Stress 27-40	157(32.1%)	25.7 (±5.4)
p-value was obtained using one way ANOVA		

P value 0.45

DISCUSSION

The aim of this descriptive study was to evaluate the association of perceived stress with gender and body mass index (BMI) in students appearing in the university entrance examination. Student's life or College life is considered the hardest stage of life, in which every student want to achieve higher grades or higher marks in intermediate classes, and in the entrance examination of medical and engineering universities. It is the time duration in which changes occur in autonomy and freedom, due to pressures from family and society increased for a bright future, so they adopt a busy or erratic schedule for studies[18].

Major change occurs in the student's life such as in dietary habits, intake of drinks, sleep pattern, and in mental health. As the homeostasis of the human body is disturbed, due to various stressors like increased responsibilities, or lack of time management in this stage, college students will face stress. According to our study results, the mean perceived stress was 21±10 in college students. These findings were in line with previous descriptive studies, done in Serbia and in Puna India[19,20].

According to our study results regarding the ranges of perceived stress scores, there were moderates stress was 42.1% with a PSS score range between 14 – 26 units, and a high level of perceived stress was 32.1% with a PSS score range between 27-40, and low stress 25.8% with PSS score ranges between 0-13, as summarized in Table I. In our study results, an association of mean Perceived Stress Scale (PSS) with gender (male & female)

showed significant differences (P<0.05), as summarized in Table II. These findings were in line with the results of Graves et al[21], Schmaus et al[22] Thawabein and Quaisy[23].

According to our study results, no significant (P>0.05) association between different levels of Perceived Stress Scale (PSS) with gender was observed, similar to our results observed in Lahore[5]. In adolescents, the gender-related difference in stress levels (girls showing higher levels of stress than boys) occurs due to physiological (sex difference), neurobiological and sociocultural differences that are responsible for establishing and maintaining an interpersonal relationship in this period of life[24]. There were no significant (P>0.05) association were observed between different levels of Perceived Stress Scale (PSS) with mean body mass index of students in our study. These observations were in line with previous studies, done in KSA[6].

Perceived stress is associated physiologically with body mass index (BMI), as stress increases, BMI also creeps up, and if not dealt with properly, ultimately will be a predisposing factor for the development of psychological distress or depression and adrenal burnout. The stress hormone is secreted by the adrenal cortex, which is the Cortisol hormone. The hormone cortisol is responsible for affecting the normal physiology of the human body through psychological effects, immunological effects, and metabolic effects, due to stress, cortisol hormone secretion causes multi-systemic effects like obesity or distress or negative form on the human body. It is a physiological reaction (defensive) of the human body, against increased demands or threats like educational pressures, parental expectations, and environmental factors or society, for the best performance in getting admissions in professional universities, best carrier growth, fear of failure or nor meeting the expectations of teacher, parents or relatives and society. Acute stress responses in adolescents, who are young, and healthy may be adaptive and typically do not impose a health burden, while chronic stressors lead to emotional distress, or antisocial or somatic symptoms, can develop high blood pressure, loss of the immune system, negative long-lasting effects on the human body by producing various hormones like cortisol, serotonin, epinephrine, and norepinephrine or activation of various system like Autonomic nervous system, hypothalamic–pituitary-adrenal system and serotonin system (Physiological or biological responses) or by psychologically by the development of anxiety, depression, and stress, as to cope the changing stressors for regulation of the internal environment of the human body or maintenance of homeostasis. Based on these findings, a few recommendations will be suggested for students, educators, and for parents for improving their quality of life, like A) organizing workshops for students for stress management, time management, and skill development before exams. B) Counselling sessions should be arranged for students along with parents, as to identify or decrease family problems or socioeconomic problems. C) Counselling sessions should be arranged to increase the teacher-student relationship, as to cope with the stress, as to achieve higher grades or marks in exams.

CONCLUSION

In this study moderate stress was observed and perceived stress was significantly associated with gender in our study participants.

Conflict of interest: Nil

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