PEOPLE: International Journal of Social Sciences
ISSN 2454-5899

Hartati et al., 2018

Volume 4 Issue 2, pp. 1347-1363

Date of Publication: 18th September 2018

DOI-https://dx.doi.org/10.20319/pijss.2018.42.13471363

This paper can be cited as: Yadav, S., Ghosh, V., & Kumar, I. (2018). Impact of Perceived Stress on General Health: A Study on Engineering Students. PEOPLE: International Journal of Social Sciences, 4(2), 1347-1363.

IMPACT OF PERCEIVED STRESS ON GENERAL HEALTH: A STUDY ON ENGINEERING STUDENTS

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Abstract

In today's competitive world, individuals have to undergo varied stressful situations right from their adolescence to old age. Students who are pursuing their higher education cannot keep themselves away from the inevitable and inescapable wrath of anxiety and stress, resultant from the demands of the present education system. Thus, the present research examines the relationship between perceived stress and general health of engineering students. The Perceived Stress Scale (PSS; Cohen et al., 1988), and the General Health Questionnaire (GHQ; Goldberg, 1981) were administered on 139 engineering students from two reputed engineering institutions in India, one in Bangalore and the other in Raipur, aged 18 to 22 years. Data analysis techniques such as Pearson correlation coefficients were used to identify relationships between perceived stress and general health. General health consists of two factors: sense of accomplishment (SOA) and botheration-free existence (BFE). Results showed that both SOA and BFE are negatively correlated with stress. As perceived stress increases, student's sense of

accomplishment (i.e. their zeal to make an impact) decreases, but this relationship was found to be non-significant. Again, stress was negatively correlated with BFE and this time a significant relationship was found, i.e. as stress increases it induces worry and botheration in students. Further, this means that in these institutions, students' perceived stress induces negative health conditions in them. However, students who can adopt better coping mechanism would have a better state of general health.

Keywords

Perceived Stress, Coping, General Health, Student, Gender

1. Introduction

Stress is an inevitable part of human life (Jackson, 2014). In a competitive world, we experience stress and strain even more frequently than ever in various forms, right from early childhood days. These stressors could be of positive or negative, momentary or prolonged nature, arising due to activities in our daily life. Its severity depends on our coping ability, and in turn depending on the severity of strain and stress, it may lead to different positive or negative physiological, psychological, biological, or behavioural changes in individuals. However the word stress and strain is so far perceived in a negative sense. It is seen within a continuum of low to high magnitude with minor problems such as physical, psychological and emotional problems, which could be potentially life-threatening at times.

In dealing with stress and strain, researchers have tried to understand the causes and outcomes of stress and the experience of such stress in individuals in terms of its severity. There is abundance of literature that talk about the causes and outcomes of negative stress in the general populace caused due to job or lack of job, finances, relationships and family problems to name a few. However, in the last few years there have been developments in the positive sense of stress as well, wherein they interpret stress as an indicator of the effort we put into our work, and consider it as essential for success (Jain and Sinha, 2005). So positive stress is a state of mind in which when the individuals experience strain, they feel they have control over their emotions and have sense of accomplishment and achievement (Jain and Sinha, 2005). Since this viewpoint of stress has still not permeated into the non-occupational domains like student stress, the present study can be useful in understanding the relationship between perceived stress and perceived general health (i.e. the psychological and emotional well-being of the individuals).

Individuals seem to vary in their ways of coping with stress and strain in different situations, which could be mainly due to their personality, experiences, or even biological differences (i.e. gender, age, etc.). Among major biological differences, gender could be the main, but past researches are not conclusive about the moderating effect of gender in case of student stress. If one is unable to cope, then she/he is likely to feel lost, stunned, frozen, or even suicidal tendency in situations like studies, relationships, finances, illness, bereavement, family problems and even fear. Since gender could be very critical in designing and managing stress activities in educational institutions, the present study can be useful in understanding the role of gender in the relationship between perceived stress and perceived general health (i.e. the psychological and emotional well-being of the individuals).

In the subsequent sections, the authors have highlighted the need for studying student stress and their general health. In light of the existing literature, the authors have laid down the hypotheses to examine the correlation between perceived stress and sense of accomplishment (SOA) and botheration-free existence (BFE). Then the methodological framework, results, conclusions, implications and limitations are discussed in respective sections of the study.

2. Literature Review and Hypothesis formulation

Although there is so much literature on stress that researchers have several alternative definitions to choose from, yet there is inconclusiveness with regard to the basic definition of stress. But if one categorizes them then will find that most of them are elaborated, extended or modified forms of definitions of stress that was originally given by Lazarus (Lazarus & Delongis, 1983; Lazarus, 1981). In the opinion of Lazarus (Lazarus & Launier, 1978), stress occurs the way we appraise our interaction with the environment. It leads to stress only when the individual perceives it as taxing to her/his adaptive resources. So, one's personal/cognitive abilities in coping and managing affective experiences are extremely important. One such personal coping ability is self-efficacy. According to Bandura (1995) people with high self-efficacy are perseverant with the task even in the face of difficulty and achieve higher results even with higher levels of stress, thus, augment human accomplishments and well-being in several ways (Pajares, 2002). So, from existing definitions point-of-view, no condition or event is universally stressful (Fleming & Baum, 1984). The occurrence of stress is highly dependent on individual. Therefore, in the extant definitions, researchers have focussed either on the

individual, environment, or the interaction between the two, considering stress as a stimulus, response or a hypothetical state (Shirom, 1986).

Past researchers have used various approaches to study stress over the last 20 years. In general, they have mainly dealt with the question "What is at stake" for someone under stress. To understand this, they have used an interactionist approach, in which Appraisal Theory (Lazarus, 1976) has served as a key framework for researchers who believe stress as a perception of threat (Lazarus, 1976). Since perception is determined by the need (Adler, 1927; Levine, Chein & Murphy, 1942; Snygg & Combs, 1949), so stress has been considered as something which threatens the need satisfaction of individuals (Aherne, 2001). Combs, Richards and Richards' (1976) suggest that individuals always try to maintain and enhance her/his perceived self, and in this process have to cope with several kinds of threats to self-adequacy (or stress), which at its extreme may even lead to 'self-annihilation' (Rowe, 1987). The interactionist approach has also been extended to understand student stress (Whitman, Spendlove & Clark, 1984), as it caters to the developmental needs of students and explains what is at stake for them, when they experience stress. In recent years, the interactionist researchers have looked at the cognitive basis of stress through concepts like frame of mind (Darling et al. 2007), worldviews, sense of coherence (SOC), emotional exhaustion, reduced personal accomplishment (Maslach, 1998), etc. as moderators or outcomes of stress (Antonovsky (1998). The way one views the world could be related to one's coping abilities and subsequently quality of exchange or interactions (McCubbin, Thompson, Thompson, & Fromer, 1993).

There is ample amount of literature devoted to the causes of stress among students, though not much in the context of South Asian students. Stress is an inevitable phenomenon for students who aspire or pursue professional courses like engineering, medical, law etc., than those students who pursue general courses like arts, basic science, sociology, etc. There are several evidences in the literature that stress among undergraduate students all over the world, particularly those in professional courses, experience stress of moderate severity or above levels more than others in the form of high rates of depression and anxiety due high parental expectations, frequency of examinations, sleeping difficulties, vast academic curriculum, loneliness (Shah et al, 2010). Among non-academic reasons of stress, home-sickness, limited time for recreation (Abraham et al 2009), verbal/ physical abuse, task given by seniors, conflicts among peers, love affairs related problems, and health issues (Sarkar and Saha, 2015) are some of the contributing factors. Skead and Rogers (2014) study examined that students who spend

quality time with family, friends, and partners and who exercise tend to experience lowest levels of stress. Their study also highlighted that student who are engaged more in online leisure activities experience more stress. Chambel and Currals' (2005) study on Portugese University students' claims that student's level of satisfaction has a direct impact on their academic performance. They found that low level of anxiety/depression is linked with high levels of satisfaction and performance.

When students' see the world from the point of view of individuation, differentiation and independence (Fulmer, 2005), they undergo severe emotional, social and academic turmoil during their college life. Researchers have reported that students who are low on SOC are most likely to experience chronic levels of stress due to failure in dealing with potential stressors, such as finances, different types of responsibilities and academic workload, as well as adjustments in family and interpersonal relationships (Towbes & Cohen, 1996; Jackson & Finney, 2002). Although in literature we very often come across the fact that the feeling of stress is dependent on an individual's control, yet not many researchers emphasise the self as a central component in their explanations of student stress. Nor has there been any vigorous attempt to examine and understand 'what is at stake' for students when they experience stress (Aherne, 2001). In some studies, researchers have highlighted certain factors like financial situations, security and safety, lifestyle, academic experiences, housing problems, physical health associated with stress among university students and claims that university students are more prone to above-average stress levels (Humphrey et al 1998). Ross, Niebling and Heckert (1999) have identified the scope of 40 potential situations/reasons for developing stress in students' life, which they classified into four broad categories: interpersonal, intrapersonal, academic and environmental. According to Ross, Niebling and Heckert (1999), the top five reasons of such stress in students are: changes in eating & sleeping habits, need for timely vacation/breaks, high workload, and frequent delineation of new responsibilities. Some studies have also ascertained that psychosomatic disorders such as headache, sleeping problems, tachycardia, ulcers and high blood pressure could be too the causes of stress in individuals (Mazumdar el al 2012). Students' job and placement are some of the factors which significantly contribute to stress (Prabhakar & Gowthami, 2011).

Past research highlights that students are more prone to experiencing stress during their undergraduate student life (Brown et al., 1999). They tend to face culture shocks due to changes in the life-style brought due to the burden of academic and non-academic changes of university life. Many fail to cope with this change and stress starts arising in them during this transitory

phase of life and may lead to their poor academic performance or increased chances of psychological distress (Dwyer & Cummings, 2001). This may further transcend to poor overall adjustment and loss of self-confidence even (Wintre & Yaffe, 2000). To add more, while a student trying to cope-up with the increasing academic demands, may even experience more stress if she/he is also trying to build new social relationships (Tao et. al., 2000; Dwyer & Cummings, 2001). Researchers have talked about some common stressors in medical students *viz*, tests and examinations pressures, content pressure, time pressure, poor marks, not able to meet self-expectation, anxiety due to insufficient skills in practice, failure to meet deadlines, action plan or work schedule, heavy workload, having difficulty in understanding the content and fail to provide answers to teachers' questions (Yusoff et al., 2010). It is found and claimed by many researches that stress affects students' academic achievement very much (Elliot et al., 2005; Choi, Abbott, Arthur & Hill, 2007). Some researchers have asserted examinations, grade competitions, information overload are key stressers (Carveth, Gesse & Moss, 1996). A study on business undergraduates has also proven that stress is significantly correlated with poor academic performance (Bennett, 2003). The need to embark on this study is thus justified. For this research, stress is defined as happenings and experiences that provoke anxiety and academic achievement in undergraduate students' and hamper their academic grade point average (GPA) and psychological well-beings.

Researchers have also highlighted on the potential consequences of stress on student life. There is a substantial amount of research dealing with stress outcomes such as problems of parental attachment (McCarthy, Moller, & Fouladi, 2001), role strain and demands (Home, 1997), social appraisal (Lee, Keough, & Sexton, 2002), health-related issues (Hudd, Dumlao, & Erdmann-Sager, 2000), feelings of loneliness, nervousness, sleeplessness and excessive worrying (Ross, Niebling, & Heckert, 1999), and when peer relationships issues occur, distress levels can be predicatively heightened (Jackson & Finney, 2002). Around the globe, the effect of stress on the mental and physical well-being of the students as well as the relation among perceived stress, coping strategies and general health has been a well-researched area. Various studies have been reported on the sources of stress among students. For example, Brown (1967) found that the incongruity between university students' desires and expectations from the institutions where they study and the reality of his/her education is the only factor for student stress. He further claims that only through thorough understanding of their range and patterns of hopes and expectations, and by devising and designing a variety of educational environment will help the

students to overcome their emotional and intellectual barriers. Thus, on the basis of above mentioned arguments, therefore hypothesis1is formulated to test the effect of students' perceived stress on their general health.

Hypothesis 1: *Perceived stress of the students is negatively correlated with their general Health.*

However there is conflict with regard to gender, age, and other demographic differences in the feeling of anxiety and stress among students. Some researchers have reported that anxiety and stress is reportedly higher among female students while some have reported it the vice-versa. Similarly some researchers have reported that students experience more stress during initial years of college, while some have reported its exact opposite, i.e. senior students experience more stress than the new entrants. Students or we can say adolescents are mostly concerned about their physical appearances, and are even dissatisfied with their physical appearances (Siegel and Lane, 1982), which may be putting them into stress. Wang and Ko (1999) state that girls feel more stressed than boys, when it concerns about physical appearances. Therefore hypothesis 2 tests the gender difference in stress perception.

Hypothesis 2: *Male students perceive more stress than female students.*

Several studies have examined the gender differences in perceived stress (Anbumalar et al., 2017; Hogan, Carlson, & Dua, 2002; Ptacek, Smith, & Zanas, 1992; Tamres, Janicki & Helgeson, 2002). Darling et al.'s (2007) study on students' of a Southern University college suggest that female students are more prone to stress due to the quality of friendship, love relationship and relationship with their parents that they have. Both female as well as male students differ in their experience, perception and coping (handling) of stress in their life (Burke & Weir, 1978). Although gender differences in perceiving stress has been extensively talked about in the past researches, yet very little is known about whether or not gender is a moderator of student stress, i.e., understanding whether differences in how academic stress is handled by males and females is still not evident (Baker, 2003; Lee et al., 2002).

Some researchers have seen the cross-sectional effect of gender and social connectedness on perceptions of stress (Baker, 2003; Lee et al., 2002). Males being more independent tend to have less social connectedness than females (as they being more interdependent) which in turn affect their perceptions of stress. For both males and females, however, social connectedness was highly correlated with perceived stress (Lee et al., 2002). Holmbeck and Wandreis' (1993) study focused on the role of gender differences in accessing parental support and its affect in adapting the new environment of the university. A higher level of family attachment, cohesiveness,

instrumentality, self-esteem and parental support has been closely associated with low levels of stated anxiety and depression in female than male students. Parental attachment and support is a very important predictor of students' positive adjustment to university life. Researchers have reported gender differences in students living with parents during versus students living alone during transition to college. It was reported that, while making the transition to college, male students experience least stress if they live at home with their parents while female students have an elevated risk of stress (Lafreniere et al., 1997). Extended level of family support tended to report high levels of university life adjustment, irrespective of whether or not they left home for the first time to attend school. Females reported significantly better adjustment to university life when they are independent and lived away from home, whereas males appeared to be better adjusted when they continued to live at home. Parental social support appears to exert a significant influence on young women and men in relation to their adjustment capability to university life.

Although gender differences in the negative effect of stress is very well highlighted in the existing literature, outcomes related to positive emotional adjustments and sense-of-accomplishment is still not know with regard to undergraduate students. Since males and females experience negative aspects of stress differently (Baker, 2003; Lee et al., 2002), hypothesis 3 aims to examine gender differences in the relationship between perceived stress and sense-of-accomplishment of undergraduate students through the following hypothesis:

Hypothesis 3: *Male students' stress is highly correlated with sense-of-accomplishment than Female students' stress.*

4. Methodology

In the current study, a quantitative approach was taken. The study was conducted taking student samples from two renowned undergraduate technical institutes of India. Questionnaires were randomly distributed to the students of both technical institutes. Perceptions on their stress level and general-health were captured in the survey.

4.1 Sample

Respondents were randomly selected from various departments in their respective institutes. The total sample includes 139 students where 105 were males and 34 were females. Their age varies from 16 years to 20 years. 52.5% of the students were from urban background.

4.2 Measure

Perceived Stress (PSS): It was measured using Cohen and Williamson's (1988) Perceived Stress Scale (PSS) scale, which consists of 10 items measuring the thoughts and feelings of an individual who has experienced stress in the recent past. Using a 5-point scale (1= Never and 5= Very Often), a student's perceived stress was measured. The Cronbach's alpha of the scale is 0.60.

General-Health (GH): This scale captures an individual's general feeling with regard to some behavioural or emotional changes the individual might have experienced in the recent past. Originally, it was measured using a 12-item General-Health Scale (Goldberg 1972). However, a recent study in Indian settings (Jain and Sinha 2005) measured GH on the same scale using two factors of GH of 6 items each, *viz.*, Sense-of-Accomplishment (SOA) and Botheration-Free-Existence (BFE). Sense-of-accomplishment items represented one's state of fulfilment on performing or contributing something worthy, whereas botheration-free-existence items (using reverse-coded items) signified a worry-free existence or a laid-back attitude toward life (Jain et. al. 2005). The two factors were measured on a 5-point scale (1= Disagree strongly and 5= Agree Strongly). The Cronbach's alpha value for Sense-of-accomplishment scale was 0.65 and Botheration-Free-Existence scale was 0.63.

5. Results

To test hypothesis 1, Pearson-correlation test was conducted on the average score of PSS and GH, and observed that there is a moderate negative correlation between students PSS and BFE (r = -.48, p=.00) and a moderate positive correlation between PSS and SOA (r = .44, p=.00) Therefore, perceived stress can modulate general health feelings of students in a positive or negative manner. Therefore, hypothesis 1 was partially borne out.

To test hypothesis 2, *t*-test was conducted on the scores of PSS for both male and female students. There were no significant differences found in the male and female stress conditions, $t(137) = 1.21$, $p = .22$. Therefore, Hypothesis 2 was not supported.

Pearson-correlation test on the average score of PSS and SOA revealed a moderate positive correlation between PSS and SA (r = .38, p=.00) and a high positive correlation between PSS and SOA in female students (r = .60, p=.00) Though there is no significant difference in the SOA between male and female students $t(137) = .10$, $p = .91$, the way stress is perceived by the two gender triggers their sense-of -accomplishment differently. Therefore, Hypothesis 3 was not

supported.

6. Discussions & Conclusions

A high botheration free existence among students (Refer Table 1) indicate that they were demotivated and were not posed with enough challenging work. Difficult goals or tasks can motivate individuals to perform exceedingly well which brings a sense of self-satisfaction (Locke & Latham, 1990). However, an individual pursuing difficult goal can be under high perceived stress which is eventually detrimental to the individual's general-health conditions.

The positive correlation of perceived stress with sense-of-accomplishment implies that under stressful conditions students can maintain a positive mental state. The students under such conditions perceive that their efforts invested are worthy and this give them a sense of fulfilment. According to Epstein (1992), a person assesses his/her objective activity demands as a "productive load" by analyzing their relevance to socially and personal useful activities. Students who perceive education related activities as "productive loads" may have high sense-of accomplishment. Being fully engaged and interested in academic tasks has been found to alter perceived academic stress globally (Larson, 2006). This in turn reduces negative health conditions (a laid back attitude, helpless feeling) which is indicated in the negative relation observed between stress and BFE. However, it is to be borne in mind that human performance is enhanced till an optimal stressful point, beyond which additional stress can lead to decline in performance (Yerkes and Dodson, 1908; Broadhurst, 1959).

Nag, Nongmaithem & Tripathi (2008), attributed increased opportunities for women in higher education as one of the prime factors for diminishing gender differences in Indian society. Low discriminatory practices through certain affirmative actions in organized institutions create a paradigm change in the males' and females' attitude towards work (Tripathi, Ghosh, 2018). Female students are equally competitive compared to male engineering students and thus scoring high marks or getting a well-paid job become equally important to both genders. Therefore, academic related stress is equally disseminated among male and female students in engineering colleges.

Perceived stress is found to be highly correlated with female's SOA than male students. This indicates that females perceive engineering education as a worthy professional degree to pursue. In a study conducted by Smith (2012), found that the ability to be creative and to make a positive impact in the world was instrumental in female's decision to major in engineering. In

India, where engineering is still considered a "male dominated" discipline, female engineering students perceive a high sense-of-accomplishment in competing with male counterparts. They perceive their efforts in stressful conditions worthwhile and self-fulfilling.

7. Limitations

The main purpose of this study was to understand the correlation between perceived stress and general health (i.e. psychological and emotional well-being) in students to understand their institutional environment, and gender differences in such perception. Although, the correlation study is well justified, yet two major limitations could be cited in the case of this study. First, this study did not examine any causal relations between the variables of stress perception and its outcomes. The second the male respondents were disproportionally more in number than females, making the sample highly skewed. Thus generalizability of the findings appears to be constrained, especially in the case of examining gender differences in the perception of stress.

8. Future Research Suggestions

Considerable progress has been made with regard to the measurement of general health perception as well as perceived stress of individuals. There is also availability of several standard self-administrable survey instruments that can reliably measure these constructs in diverse population. Although further research is needed to understand whether the present scales are appropriate in prospective research designs to understand the phenomenon in school children. The present research has examined the effect of perceived stress on general health using two factors: sense of accomplishment (SOA) and botheration-free existence (BFE). Further research should examine the further outcome of general health on students' academic performance, hope, resilience, self-efficacy, sense of achievement, etc. Since stress is inevitable in the present time, it is required to take up studies that can uncover the various stressors behind low sense of accomplishment (SOA) and botheration-free existence (BFE) in student population and the moderators in these relationships. Identification of such stressors will help the educational institution, state institutions, parents, and professional counsellors in designing appropriate interventions for mitigating such form of stress. In the present time special sessions could be organized by these developmental institutions targeting students facing stress and those who are likely to face stress due to work schedule, competition, illness, abuse, etc.

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Annexure-I

Table 1: *Means and standard deviations (in brackets) of Perceived Stress and General-Health dimensions (Sense-of-Accomplishment and Botheration-free-Existence) across male and female samples*

Dimensions	Male (N=105)	Female (N=34)
Perceived Stress (PSS)	2.81 (.52)	2.94 (.57)
General Health (GH)		
Botheration-free-existence (BFE)	4.01(.64)	4.01(.54)
Sense-of-Accomplishment (SOA)	1.93 (.55)	1.94(.58)