A Nonparametric Statistical Study on Data Related to Stress

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ABSTRACT

The word "stress" has become a common word in our day to day life. Situations like traffic, college studies, work pressure, job security etc., become reasons for our daily stress and we all know that it plays a major role in our health like a headache, increase in blood pressure, muscles pain, weakness etc., We may never get complete relief from stress but to keep our health better, we have to work towards managing stress. The main objective of this study is to know the common strategies applied by students and professionals (Lecturers and Non-lecturers) in the present and to assess if there is any significant difference between different categories. Since the data is not numeric, the non-parametric test has been applied for analysis.

Keywords: Stress, students, lecturer, Nonparametric test, Mann-Whitney test, Kruskal-Wallis test.

1. INTRODUCTION

Stress can arise from any abnormality in coping with different situations which can be manifested in various physiological and psychological changes. It is the body's reaction to a situation. A layperson may define stress in terms of pressure, tension, unpleasant external forces or an emotional response (Ogden, 2004, P.234). The reaction to stress is different for different people. An event or situation which can be stressful for one may be relaxing or enjoyable for another. Stress can be productive as well as destructive in nature. Stress can be a motivating factor to achieve something, but at its worst it can lead to disturbances in physical and emotional wellbeing of humans.

Causes of Stress

Different people feel stressed due to diverse reasons. What causes stress in one person may not be a reason for stress in others. Causes of stress can differ according to people's occupation. Some of the reasons for stress in professionals may be work pressure, meeting deadlines, poor time management, balancing work and family, problems at home. Stress in students can arise because of examinations, assignment submission deadlines, poor organisation skills, poor housing and personal issues. In housewives, reasons for stress could be due to difficulty in multitasking, inability to fulfil daily demands, child related concerns and issues etc. When such problems affect a person for longer periods of time, it can result in stress.

Effects of Stress

People exhibit different reactions to stress. Physical symptoms of stress could include aches, rapid heartbeat, frequent colds and infections, low energy and stomach issues. Psychological symptoms comprise avoiding others, low self-esteem, becoming frustrated, feeling overwhelmed, constant worrying and poor judgement. It can also make a person irritable, impatient, angry, anxious, insecure and unhappy. Long term effects of stress can be eating disorders like binge eating, cardiovascular diseases, mental health issues like depression and gastrointestinal problems.

Stress Management

Stress can lead to a lot of physical and emotional issues, which result in ill health of a person. Hence it is important to use different techniques to cope with stress. Having a positive attitude, being assertive, getting enough rest, meditation, exercising, time management are some of the ways in which one can manage stress. Being stress free can help an individual to lead a happy and healthy life.

2. REVIEW OF LITERATURE

People's reactions to stressors depend on their perception. Some people are simply not bothered by situations that others perceive to be stressful (Glavin *et al.*, 1991).

Stress occurs in students due to different reasons. Researchers have identified many stressors in colleges such as many assignments, competition, failures (Fairbrother & Warn, 2003), poor relationship with other students or with teachers or problems at home. Many students get stressed due to environment of the educational institution, burden of study or lack of facilities for study (Bukhsha *et al.*, 2011).

Stress may be considered negative, but a healthy or moderate level of stress motivates one to take action, accomplish something, develop new skills and achieve one's potential. Stress is not only a part of student life; it is a part of life itself. Stress which is not managed can lead to physical, emotional and interpersonal problems.It is important to learn how to identify, diagnose, and successfully manage stress (Bukhsha *et al.*, 2011).

Stress in professionals (bank employees) could be as a result of work related stressors (interpersonal or role- related), non-work stressors (time based, strain based, role conflict) and individual differences like health issues, coping skills, knowledge which differs from person to person (Nirmala 2015).

When the human resources in an organisation are stressed or unhappy, they fail to achieve individual as well as organisational objectives. This can result in loss of self-esteem in individuals which results in lesser productivity and job dissatisfaction (Kyaw-Myint and Strazdins, 2015).

The consequences of distress are low commitment, exhaustion, burnout, faulty decisions and higher absenteeism (Nirmala 2015).

Different stress management techniques are used by students to manage stress. Getting adequate amount of sleep, having a balanced diet, listening to music, keeping themselves hydrated are few ways which students use to cope with stress (Bukhsha *et al.*, 2011).

Professionals can use different individual oriented strategies for handling stress such as reading, hobbies, photography, sports, going on vacations, exercising etc. Few organisation oriented strategies could be flexible timings, job sharing, extended lunch hours and healthcare advocacy, physical activities and relaxation events which can help professionals to reduce stress. Stress–free employees are able to perform better, feel satisfied and have a long term commitment to the organization as compared to their counterparts. Changing one's perception towards stress can help in managing it (Nirmala 2015).

For the data analysis, the different statistical tests can be applied. When there is a hypothetical statement about the population the inferences can be drawn by using inferential statistical analysis which includes different statistical test and models. There are two hypothetical tests in statistics: parametric and nonparametric. A parametric test is applied when the parameter of the population is known (assuming normally distributed), when it is unknown nonparametric test has been applied where the data is not numeric. It is also called a distribution-free test (Rakesh *et al.*, 2016). The different parametric test are correlation, regression, t-test, z-test, analysis of variance and nonparametric test are Chi-Square test, One Sample Wilcoxon Signed-Rank Test, Wilcoxon Signed-Rank Paired sample Test, The Kruskal Wallis Test, Mann-Whitney U Test, and Spearman's Rank Correlation Test (Pravin and Kulkarni, 2017).

3. RESEARCH METHODOLOGY

3.1 Research Questions and Design

The purpose of this study is to identify the common symptoms of stress. Does gender or having a different profession make any difference in stress score? And what are the common strategies applied by students and professionals? To meet the above research problems the following questions were asked to respondents:
• Do you feel stressed frequently?
• Reason for stress: Daily hassles

- Reason for stress: Major events
- Physical symptoms of stress
- Psychological symptoms of stress
- Strategies applied to cope with stress
- Whether there is any positive impact of stress?

3.2 Statistical Analysis

Descriptive Statistics was applied to give a basic summary of data and since the data does not contain numeric information the nonparametric test was applied for further analysis.

3.3 Collection of data

The data was collected by means of Google forms and using WhatsApp as an instrument (tool). The questionnaire was sent to students and professionals who include lecturers and non-lecturers like, IT professionals, Govt. employees etc; and to reduce the time for data collection, the non-probability snowball sampling method was applied. Totally 96 responded for the questionnaire, their basic information is given in Table1.

Table 1 : Demographic classification of respondents

Age	%	Gender	%	Profession	%	Marital status	%
Below 18	3.1	Male	46.9	Student	52.1	Married	26
18-23	51	Female	53.1	Lecturer	9.3	Unmarried	72.9
23-30	21.9	Transgender	0	Non-lecturer	38.6	Widow/Widower	1.1
30-45	18.8						
45 & above	5.2						

3.4 Result analysis

3.4.1 Graphical Representation

From the 96 responses, it is found that 66.7% of them feel stressed frequently. Figure 1 shows the reason for stress due to daily hassles and most commonly occurred is stress due lack of relaxation, arguments and waiting in traffic signal/queue. Figure 2 represents the reason for stress due to major events and most commonly occurred is work pressure and excessive worrying. Figure 3 highlights that most of the respondents suffer from a headache and body pain during stress and most of them suffer from negative thoughts and anxiousness as shown in Figure 4. This study also emphasizes the strategies applied to cope with stress. And from Fig.5 we can see that most of them prefer to listen to music, take rest by sleeping or by sharing their problems with loved ones. From the study, we also come to know that 46.9% of them felt relaxed after they have taken action against stress and remaining felt relaxed only sometimes.

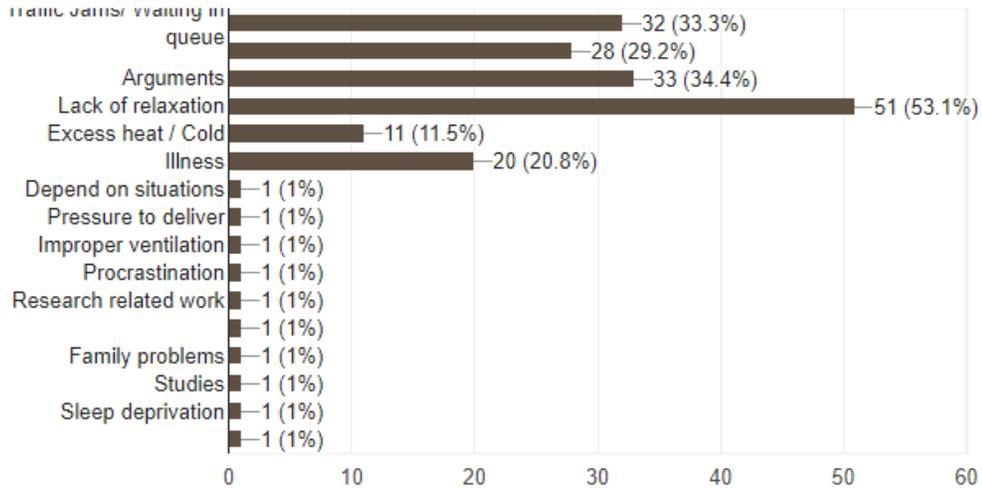## Reason for stress : Daily hassles

96 responses

Figure 1
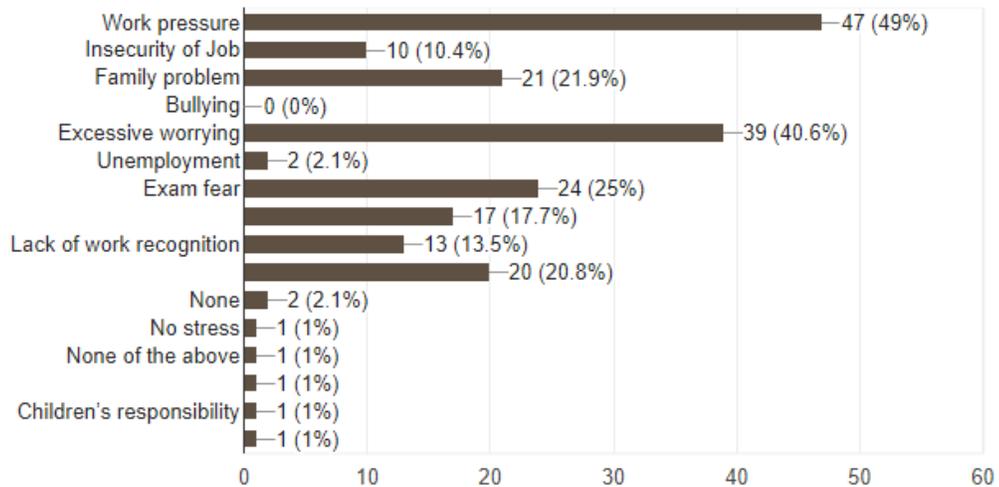
Reason for stress : Major events

96 responses

Figure 2

1945

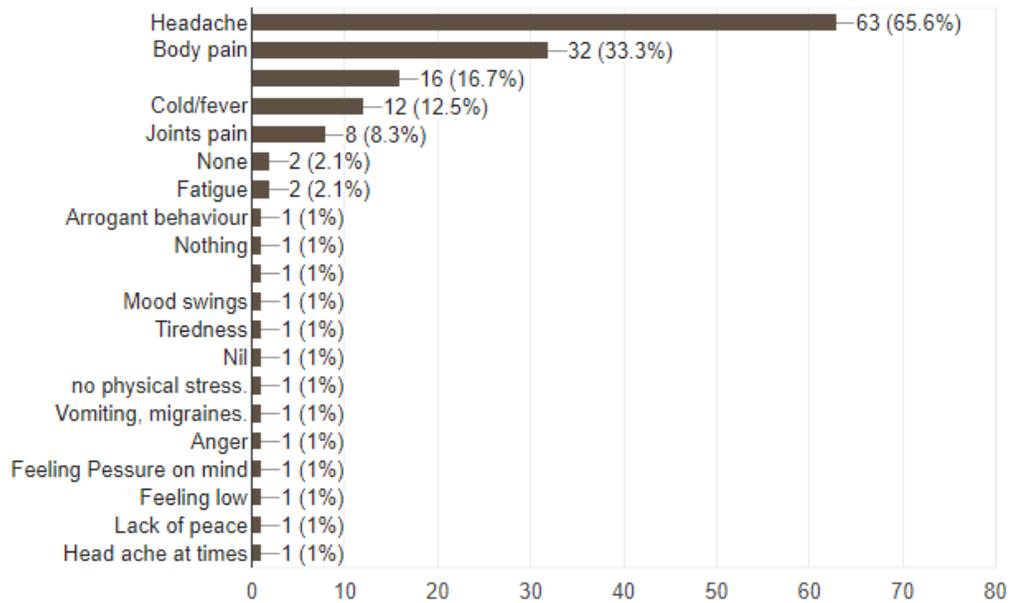## Physical symptoms of your stress

96 responses

Figure 3

Psychological symptoms of your stress
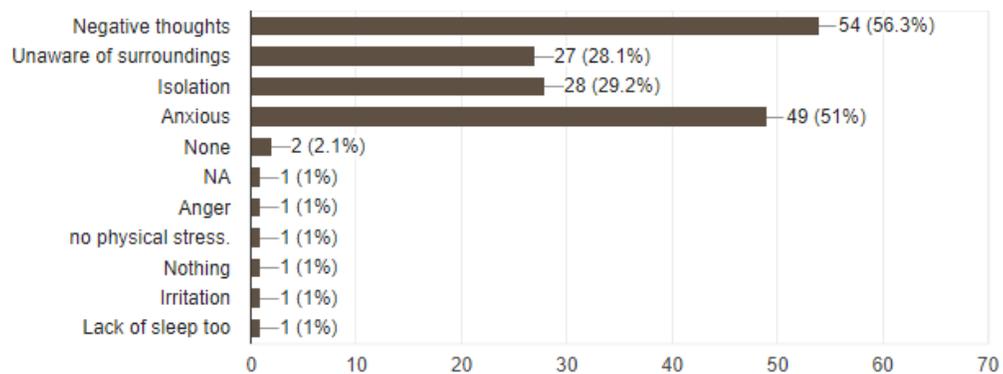
96 responses

Figure 4

1946

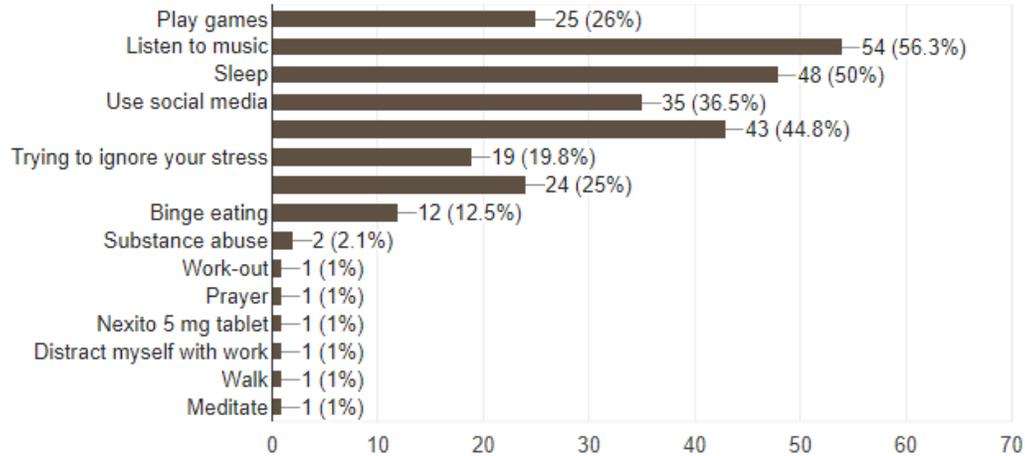## Ways you use to cope with stress

96 responses

Figure 5

3.4.2 Statistical Tests

Different statistical methods have been applied to check the significance between two or more categories and since the data is not numeric, the Mann-Whitney Wilcoxon test was applied to check the significant difference between two samples, for more than two samples Kruskal – Wallis test has been applied and to check the association between two categories the Chi-Square test has been applied. Since the data set is large, it was stored in excel sheet and analysis was done by using R software.Due to not numeric data, to measure the stress score the weight in terms of rank has been given to different stress options selected by respondents and individual stress score was calculated. This score was considered for further analysis. For the research question: Reason for stress due to daily hassles,

Mann-Whitney Wilcoxon test has been applied for the following hypothetical statements.

➢ H0: There is no significant difference between students and professionals on stress score
H1: There is a significant difference between students and professionals on stress score
➢ H0: There is no significant difference between lecturer and non-lecturer on stress score
H1: There is a significant difference between lecturer and non-lecturer on stress score
➢ H0: There is no significant difference between male and female on stress score
H1: There is a significant difference between male and female on stress score

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Table 2 : Mann-Whitney Wilcoxon test Result

Significant difference between	Mann-Whitney U-statistic (T)	p- value
Student and professionals	871	0.229
Lecturer and non-lecturer	182	0.1673
Male and female	1905	1.604e-08

Significant at the 0.05 level

From p-value we can conclude that

➢ There is no significant difference between students and professionals on stress score (p-value>0.05)
➢ There is no significant difference between lecturer and non-lecturer on stress score (p-value >0.05)
➢ There is a significant difference between male and female on stress score (pvalue<0.05)

Kruskal – Wallis test has been applied for the following hypothetical statement.

➢ H0: The location(median) of stress score for student ,lecturer, and non-lecturer is statistically equal
H1 : The location(median) of stress score for student ,lecturer, and non-lecturer is statistically not equal

Table 3 :Kruskal – Wallis test Result

Significan difference between	Kruskal-Wallis chi-squared	df	p-value
Students,lecturer and non-lecturer	3.5256	2	0.1716

Significant at the 0.05 level

From p-value we can conclude that there is no significant difference between Students, lecturer and non-lecturer on stress score. (p-value> 0.05)

Chi-Square testhas been applied for the following hypothetical statement.

➢ Ho: Marital status is independent of family responsibility
H1: Marital status is dependent on family responsibility
➢ Ho: Relaxation after stress management strategies applied is independent of gender
H1: Relaxation after stress management strategies applied is dependent on gender
➢ Ho: Frequent occurrence of stress is independent of marital status
H1: Frequent occurrence of stress is dependent of marital status

Table 4 : Chi-Square test Result

Significant difference between	Chi-Squared test	df	p-value
Marital status and family responsibility	5.1767	1	0.02289
Relaxation and gender	4.731	2	0.0939
Frequent stress and marital status	0.28291	1	0.5948

Significant at the 0.05 level

From p-value we can conclude that

➢ Marital status is dependent on family responsibility
➢ Relaxation after stress management strategies applied is independent of gender
➢ Frequent occurrence of stress is independent of marital status

4. CONCLUSION

From the statistical analysis, we can conclude that there are no changes in stress score between different categories except gender (Mann-Whitney Wilcoxon test and Kruskal – Wallis test). The study by American Psychological Association also found that the stress level of women is more compared to men. The reason might be due to the economy, marriage, kids, friendship etc., From Chi-square test it was found that there is no effect of marital status on frequent occurrence of stress but we cannot really rely upon the result since the data of married respondents was less.

Stress is nothing but the way your mind reacts to the situation which you're actually not comfortable about it. Stress canarise either by outside pressure or inside pressure. It can lead us to good as well as to bad. From study we found that 28.1 % of respondents felt that stress has helped them to do something better. Ultimately it depends on how we perceive stress. We cannot completely get rid of stress but we should give a try to our body and mind to cope with it. We should try to manage our stress so that it won't lead to health issues. From the study we found that 46.9% of the respondents feel relaxed once they apply stress management strategies. We can suggest the following strategies to stress management from this study: listen to music, take rest by sleeping or by sharing problems with loved ones.

5. REFERENCES

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