SCIENCE OF STRESS – PSYCHOLOGICAL, BEHAVIORAL AND BIOLOGICAL DETERMINANTS OF HUMAN STRESSORS DURING COVID-19

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ABSTRACT

Stress is a modern endemic. It is to be noted here that any human body isn’t designed to always stay in a state of perpetual stress and remain always in good and healthy conditions. Symptoms of stress to a person affects their health, immaterial of whether a person realizes the causes of illness. Stress may be the cause of irritating headache, insomnia and our lower scale of output at the workplace, which may not be known to us. These stress symptoms, if left unchecked, gradually gets cumulated and affects our body, our thoughts, our feelings and our emotions. These, at a later stage further accumulate and put a person to many health problems such as chest pain, excessive blood pressure, obesity and diabetes. An attempt was made to study the biological factors of stress that in-turn affects the health of a person. The study further emphasizes the factors that cause harmfulness to various parts of the human body due to stressors. The study is made to highlight the importance of stress, not to look at it as an everyday part and parcel of our daily life, but to portray the seriousness of the same which as an everyday ingredient in our day-to-day operations, turns to be a death-killer, one day. The data was obtained on a sample of 50 employees from engineering sectors (24%), Medical staff (30%), School Teachers (26%) and Public sector units (20%) in Chennai. They are graded on a 5-point Likert-scale starting from Very High with a maximum of 5 points to a minimum of 1 point for Very Low. The data obtained were investigated using statistical descriptive analysis such as Mean and Standard Deviation.

Keywords: Eustress, Distress, Chronic stress, Acute stress, psychological stress, biological determinants

I. INTRODUCTION

Stress is a common, essential, physical, psychic and psychological response to lifestyles experiences. The subsistence and sustainment of life is alarmingly reckoning on keeping one’s inner milieu consistent, stable and uninterrupted in the face of a changing circumstances and conditions. This was called as ‘Homeostasis’ (Cannon, 1929).

Stress as quoted by Selye (1956), is a term that is used to represent any effect that sternly frightens homeostasis. The observed, anticipated and sensed threat to an organism is called the ‘Stressor’ and the response or the reverberation to these stressors is called the ‘Stress response’.

Stress is an individual’s response to changes that creates a kind of taxing demands. A stressor is an event, an experience, or any environmental stimulus that creates stress within an individual. The above said kind of events or experiences is looked as a threat and as a challenge on the individual, which is of two ways, viz., physical and psychological.

Studies reveal that 90-93% of the people visiting the doctors for reasons of ill-health are due to stress related complaints. Stress and stressors not only makes a person exposed and accessible to everything starting from the highest death-causing severe disease as cancer to a very common ill-affected cold, it also on the other hand deteriorates and kills the human brain.
II. BIOLOGY OF STRESSES

There are two kinds of stressors, namely, Eustress and Distress. Eustress is a form of positive stress and Distress refers to the negative stress. The Eustress, or positive stress, comprises of the following characteristics:

- Creates a sense of Motivation and focuses on building energy
- It is limited to short-term
- It is perceived in the range of within our coping abilities
- It gives an image and a feel of excitement
- It helps to develop and increase the performance

On the other hand, Distress or negative stress, carry the following attributes:

- It creates a sense of anxiety and concern
- It could be either a short term or a long-term
- It is felt as beyond the control of our coping abilities
- An unpleasant atmosphere
- Reduced performance
- Leads of physical and mental strains

The following is the list of stressors that cause stress to people. It is categorized as positive stress and negative stress as different people will have varying reactions to varying situations.

2.1 Personal Stressors-Negative Causes:
- Being isolated and if abused
- Being injured or hospitalized
- Unemployment and bankruptcy
- Unhealthy relationship with spouse
- Absence of good contact relationships with loved ones
- Conflict in interpersonal relationships
- Legal problems

2.2 Personal Stressors-Positive Causes:
- Job promotion
- New Investments
- Spending vacation time with family
Profile development
Medically Healthy
Sound finance
No mental worries

III. TYPES OF STRESS

3.1 Acute Stress
Acute stress is caused if a person keeps thinking always or very often. Assuming if a person is thinking of the negative thoughts most of the time, than acute stress would be predominantly very high.

Most of the time at workplace, acute stress arises if the work load is high and if it is not been able to be completed within the stipulated time-frame, it becomes a burden in our heads and our shoulders and thus tends to create the acute stress. However, the stress will subside if the stress induced due to thinking is reduced.

The most common indications and features are:

- Transient Emotional distress: It is caused due to accumulation of anger, depression, anxiety and irritations.
- Transient Muscular distress: It is created on account of the factors such as pressure, strain, headache, backache, neck pain, jaw pain, and similar kind of muscle related ailments that lead to muscular and ligament problems.

3.2 Chronic Stress
Chronic stress causes variety of symptoms and affects the overall well-being of a person. It is the reaction to hysterical pressure suffered for an extended length of period of which a person perceives they have little or no control.

3.2.1 Physical symptoms of stress include:
- Weaker levels of energy
- Annoyance, Frustration, vexation and trouble
- Restlessness, Sleeplessness and Insomnolence
- Faster heartbeat and symptoms of chest pain
- Feeling unclear, bleary, blurred and distorted

3.2.2 Stressors lead to psychological and emotional signs, viz.,
- A feel of sluggishness, persistent feelings of sadness, Doziness
- Pessimistic in nature
- Gastro-intestinal problems
- Overwhelmed, crushed, defeated and apathetic
- Loss of memory and concentration
- Poor decision-handling
IV. REVIEW OF LITERATURE

Black DS, Slavich GM. (2016). ‘Mindfulness meditation and the immune system: A systematic review of randomized controlled trials’, Annals of the New York Academy of Sciences, 1373 pp 13–24 revealed the fact that 28.5% of the private employees are found disturbed and annoyed due to various and varied levels of work carried by them at the workplace.

George M. Slavich. (2016). ‘Life Stress and Health: A Review of Conceptual Issues and Recent Findings’, X in their study revealed that 60% of the employees face acute stress due to excessive workload, work ambiguity, abnormal working pressure and improper scalar chain of authority and responsibility.

Amir Mohammad Shahsavarani, Esfandiar Azad Marz Abadi, Maryam Hakimi Kalkhoran. (2015). Stress: Facts and Theories through Literature Review, International Journal of Medical Reviews 2(2); pp 230-241 in their study revealed the fact that the employees are drained due to long working hours and hence found to lose energy levels.

Akanji Babatunde. (2013). ‘Occupational Stress: A Review on Conceptualizations, Causes and Cure’, Economic Insights – Trends and Challenges, 2(3), pp.73-80 revealed the fact that factors such as excessive workload, role ambiguity, poor inter-relationship among the peers, lack of respect and poor working conditions as the stressors affecting the employees at the workplace.

Byers, D., Beard, T., and Wicks, M. (2009). ‘African-American Women’s Perceived Health Status while Caring for a Relative with End Stage Renal Disease’, Nephrology Nursing Journal, 36(6), pp.599-632 in their study revealed that the women employees face chronic stress which affects their family life very badly.

V. RESEARCH METHODOLOGY

The sample size, mode of data collection, Research Instrument, Sampling Techniques, Sampling frame and Statistical Techniques are shown below:

Table 1: Research Methodology

<table>
<thead>
<tr>
<th>S.No</th>
<th>Research Methodology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sample Size</td>
<td>50 (Engineering sectors-24%, Medical staff – 30%, School Teachers-26% and Public sector units-20%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary Data</td>
</tr>
<tr>
<td>2</td>
<td>Data Collection</td>
<td>Secondary Data (Journals, websites and magazines)</td>
</tr>
<tr>
<td>3</td>
<td>Research Instrument</td>
<td>Close-ended Questionnaire</td>
</tr>
<tr>
<td>4</td>
<td>Statistical Techniques</td>
<td>Mean &amp; Standard Deviation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t-Test to compare groups</td>
</tr>
<tr>
<td>5</td>
<td>Sampling Techniques</td>
<td>Stratified Random Sampling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convenience Sampling</td>
</tr>
</tbody>
</table>

Table 2: The sampling frame for the study is shown in the table (For N=50)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Criterion</th>
<th>Sample size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Employees : Engineering sectors</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Employees : Medical staff</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Employees : School Teachers</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>
VI. DATA ANALYSIS AND INTERPRETATIONS

Table 3. Descriptive Statistical Analysis – To assess the level of Acute stressors affecting the employees in the workplace – Sample size: N=50

<table>
<thead>
<tr>
<th>S.No</th>
<th>VARIABLES</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excessive Workload</td>
<td>4.24</td>
<td>1.158</td>
</tr>
<tr>
<td>2</td>
<td>Muscular Problems ( Neck / Jaw pain etc)</td>
<td>4.11</td>
<td>1.127</td>
</tr>
<tr>
<td>3</td>
<td>Mental Stress ( Pressure, Strain etc)</td>
<td>4.18</td>
<td>1.136</td>
</tr>
<tr>
<td>4</td>
<td>Accumulation of anger / depression</td>
<td>4.17</td>
<td>1.134</td>
</tr>
<tr>
<td>5</td>
<td>Improper Work-life balance</td>
<td>3.97</td>
<td>1.089</td>
</tr>
<tr>
<td></td>
<td>TOTAL MEAN VALUE</td>
<td>20.67</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation of Results from Table 3:

It is observed from the above analytical data that the overall Mean Value of the Acute stressors affecting the employees in the workplace is 20.67, which is 82.68% (20.67 / 25 x 100). This clearly reveals that the Impact of Acute stressors creating discomfort to the employees at the workplace is 83%. Among the five variables, the mean value is higher(4.24%) for the variable, ‘Excessive Workload’ and lower for the variable, ‘Improper Work-Life Balance’. Similarly, other variables such as, ‘Mental Stress’ and ‘Accumulation of anger/depression’ whose mean values are 4.18 and 4.17 respectively also have an equal impact on the occurrence of acute stressors to the employees at the workplace. As the mean values of all the five variables are above 4 (80%) out of 5, the Impact of work satisfaction of the employees at the workplace due to Work environmental factors is found to be more than the average.
“Acute stress is available in everyone. It is a form of stress that is highly correctable and controllable. It is to be periodically monitored, treated and should be made manageable. Repeated acute stress will create more harmfulness to the physical and mental health of a person.”
Interpretation of Results from Table 4:

It is observed from the above analytical data that the overall Mean Value of the Chronic stressors affecting the employees in the workplace is 20.58, which is 82.32% \((20.58 / 25 \times 100)\). This clearly reveals that the Impact of Chronic stressors creating discomfort to the employees at the workplace is 83%. Among the five variables, the mean value is higher (4.18%) for the variable, ‘Weaker Levels of Energy’ and lower for the variables, ‘Loss of Memory and Concentration.’ Similarly, other variables such as, ‘Overwhelmed, Crushed and Defeated and ‘Annoyance and Frustration’ whose mean values are 4.17 and 4.14 respectively also have an equal impact on the occurrence of chronic stressors to the employees at the workplace. As the mean values of all the five variables are above 4 (80%) out of 5, the Impact of Chronic stressors affecting the employees in the workplace is found to be more than the average.

![The level of Chronic stressors affecting the employees in the workplace](chart.png)

Figure 4: The level of chronic stressors affecting the employees in the workplace
Figure 5: Stress Hormones Affect your Breathing and the Cardiovascular Systems

VII. EFFECTS OF STRESS TO A HUMAN BODY

A Japanese research indicates the following ill-effects that are caused mainly due to stressors that are inhaled by a human body. They are as follows:

1. Acidity: It may be due to a kind of burning sensation in the chest caused by diet errors, but more dominated because of stress.
2. **Hypertension**: It may be caused due to high consumption of salt, fat, and/or cholesterol, but primarily due to mismanagement in managing emotions.

3. **Cholesterol**: It is required to the human body to build healthy cells. Contrary to it, higher levels of cholesterol may increase the risk of heart diseases, but the excessive laziness or inactive becomes more responsible.

4. **Asthma**: It occurs mainly due to interruption of oxygen supply to lungs, but often sad feelings occurred due to stress plays a vital role and makes the lungs unstable.

5. **Diabetes**: It occurs not only due to large amount of consumption of glucose, but also due to adamant, rigid, uncompromising and firm attitude disrupts the function of the pancreas.

6. **Kidney stones**: It is developed not only due to calcium Oxalate deposits, but also due to mental worries, annoyance and vexation.

7. **Spondylitis**: This is developed due to heavy burden of workload, frustrating worries and depression.

**VIII. CONCLUSION**

Research studies have proved physical differences in the brains of the people with stress disorders. Chronic stress on a person leads to high risk, thereby creating too many mental illness including heart related issues, mental disorders, depression, addict to alcohol/ drugs etc., These symptoms are the causes for the brain getting shrinked, gradually makes a person stupid, it impairs the memory and makes the person take wrong decisions.

Teachers stress corrodes and destroys the peacefulness in the mind and life of teachers. It has a negative effect on their performance in their work. By and large, predominantly there’s a myth that teaching profession is less work in nature and is always stress-free. It is felt that the teachers work not more than 3-4 hours a day and the rest of the day, they are fully free. But a teacher has the most number of assignments to be carried out on a daily basis, they are the most respectable people in the universe and the sad part is that they are also the most stressed people in the universe.

**REFERENCES**