

Analysis of Corporate Stress using TOPSIS Method - A Case Study on Nationalized Banks in Madurai City

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Abstract

Stress is a major factor which affects a person's lifestyle and performance in the work place. Henceforth, it becomes extremely important for the employers to have their employees at low stress level as possible to increase their efficiency of working. The stress in corporate companies is mainly caused due to various stressors which creates the stressful environment. In the recent trend, banking industry has become a sector with fierce competition which in turn has resulted in increase in the stress level of the employees. We have done a case study on bank employees of various Nationalized and non-nationalized banks. in the city of Madurai and ranked them according to maximum and minimum stress levels using Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) Method. A survey was done to get the various stressors for the respondents. On detailed analysis of the employees, major indicators of stress were found to be Body Mass Index (BMI) value, cholesterol level and Blood pressure. Besides the paper also suggests the ways and means to reduce the stress.

Keywords

Stress, Bank, TOPSIS, Body Mass Index, Cholesterol level, and Blood Pressure.

I. Introduction

Stress can be defined as 'The way your body responds to the demands of our lifestyle' i.e the effects of wear and tear on our body. According to Hans Selye a pioneer researcher in stress reaction, "Stress is the human response to changes that occur as a part of daily living" [1]. When a person is subjected to stress producing effect known as STRESSOR (a challenge, pressure, stimulus, external Influence, etc), the stressor is registered in the brain. The brain gives various parts of the body instructions for a chain of reactions known as stress reactions or stress response.

Stress can be broadly divided in two main ways:

- Eustress: This is a positive stress which motivates a person to perform better. For example, a competition or a challenge can stress the person and make him work better.
- Distress: This is a negative stress which will cause wear to the body and decrease the efficiency of the body working. For example excessive work or tension can cause distress and result in reduction of performance.

In our discussions further in the paper, we have dealt with the distress (here after referred as stress).

A. Stages of Stress

When put under stress, the body recognizes the stress in three stages as which are described,

- Alarm: This is the first stage where the body mechanisms recognize that it is being acted upon by a STRESSOR. After it invariably in most cases the body secretes adrenalin. This is the start of the process.
- Resistance: At this stage the body prepares to resist the

STRESSOR. It cannot withstand the stress indefinitely so the body and brain start to decrease in performance.

- Exhaustion: This is the final stage where the resistance to stress is depleted and the whole body and brain functioning reduces substantially.

II. Factors influencing stress

A. Major stress creating factors

The major stress causing factors [2-4] are

- Death of a close relative
- Injury or illness
- Lack of responsibility
- Lack if english fluency and intelligent quotient
- Inability to take decisions.
- Waiting for bus
- Works during holidays and weekends

B. Daily Causes of Stress

- Environmental stressors
- Family and relationship stressors
- Work stressors
- Social stressors

C. Internal Causes of Stress

- Worries
- Pessimistic attitude
- Self criticism
- Unrealistic expectations or beliefs
- Low self Esteem
- Excessive or unexpressed anger
- Lack of assertiveness

III. Symptoms of stress

A. Cognitive Symptoms

It includes memory problems [5], indecisiveness, fearful anticipation, loss of objectivity and anxious thoughts

B. Emotional Symptoms

It comprises of moodiness, agitation, restlessness, short temper, feeling tense, depression and sense of loneliness

C. Physical Symptoms

It consists of headache, muscle tension, diarrhea, nausea, insomnia, chest pain, weight gain or loss, frequent colds.

IV. Objective

- To analyze the stress level of the employees and find the major STRESSORS.
- To suggest possible ways to increase the resistance to stress

The methodology used in our current study is shown in Fig. 1.

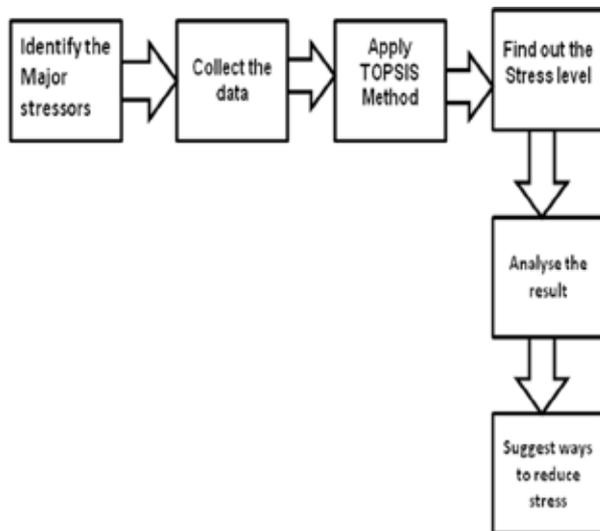


Fig. 1: Methodology

V. Stress among Bank employees

Bankers are under a great deal of stress and due to many antecedents of stress [6-7] such as

- Overload
- Role ambiguity
- Role conflict
- Responsibility for People
- Participation
- Lack of feedback and keeping up with technological change.

Being in an innovative role, career development, organizational structure, climate and recent episodic events can result in stress. This stress can directly affect the performance of the individual. During the past decade, the banking sector had undergone rapid and striking changes. Policy changes due to globalization and liberalization has increased competition and has led to the entrance of more private (corporate) sector banks, thus introducing new technologies. Due to these changes, the employees in the banking sector are experiencing a high level of stress [8,9]. The implications of the above said transformations have affected the social, economical and psychological domains of the bank employees and their relations. Evidence from existing literature states that more than 60% of the bank employees have one or other problem directly or indirectly related to these drastic changes [10,11]. All the factors discussed above are prospective attributes to cause occupational stress and related disorders among the employees.

VI. Case study

This study was conducted among 100 employees of Nationalized and non-nationalized banks in the city of Madurai, Tamilnadu, India. The major tools used for the study is TOPSIS by which we have rated the employees' stress level. Based on the results of the TOPSIS analysis, a questionnaire was designed to identify the various STRESSORS for the employees. The questionnaire contains items to measure the recent experience on physical, mental and behavioral symptoms. Also the height and weight of the employees were taken into account.

VII. Application of TOPSIS

There are a variety of multiple criteria techniques to aid selection in conditions of multiple criteria. The acronym TOPSIS [12-14] stands for technique for preference by similarity to the ideal solution [15]. TOPSIS was initially presented by Hwang and Yoon

[16], Lai et al. [17], and Yoon and Hwang [18]. TOPSIS is attractive in that limited subjective input is needed from decision makers. The only subjective input needed is weights. The calculation of the normalized relative weight of each criterion can be done by calculating the geometric mean. Finally, the normalized weights are calculated by comparing pair-wise values obtained with a total value of the pair-wise [19].

Table 1: Fixing of Weightage

Evaluation criteria	Geometric Mean	Weightage
Physical Symptoms	15.40	0.2735
Mental Symptoms	16.13	0.2865
BMI	24.77	0.4399

VIII. Results of the TOPSIS method:

The top 49 alternatives (employees) were found to experience high stress. The ideal solution range of the alternatives obtained from the TOPSIS calculation is shown in the Table 2.

IX. Analysis

The cholesterol level, Blood pressure level, and sugar levels of the 49 selected alternatives were measured and analyzed. BMI Level [20] (Body mass Index was calculated)

$$\text{BMI} = \text{Weight in (Kg)} / \text{Height}^2 \text{ in (Meter)} \quad (1)$$

The analyses of the Body Mass Index among the highly stressed 49 chosen respondents were measured and the results are shown as in Table 3.

Table 2: The ideal solution range value Obtained from the TOPSIS Calculation

No of employees	C_i^* Ideal solution range
51	0.129-0.421
49	0.603-0.842

Table 3: BMI Level distribution of the selected Employees

BMI LEVEL	No of Employees
20.01-22.00	0
22.01-24.00	0
24.01-26.00	1
26.01-28.00	23
28.01-30.00	20
30.01-32.00	5

The analyses of the Cholesterol level among the highly stressed 49 chosen respondents were measured and the results are shown as in Table 4.

Table 4: Cholesterol range and distribution of the selected Employees

TYPE OF LEVEL	CHOLESTEROL RANGE	NO OF EMPLOYEES
NORMAL	<200 mg/dL	0
BORDER LINE	200-240 mg/dL	10
HIGH	241-250 mg/dL	35
VERY HIGH	251-260 mg/dL	4

The analyses of the Blood Pressure level among the highly stressed 49 chosen respondents were measured and the results are shown as in Table 5.

Table 5: Blood Pressure range and distribution among the selected Employees

TYPE OF LEVEL	Blood Pressure Level	No Of Employees
Low	<120/80 mm Hg	2
Normal	120/80 mm Hg	2
High	121/80 to 130/90 mmHg	11
Very high	131/91 to 160/100 mmHg	22
Extremely high	>160/100 mmHg	12

Among the 49 highly stressed employees, 35 of them had high cholesterol level and 4 had very high cholesterol level. On analyzing these employees from the questionnaire the following were found. The distribution of the consumption of fat content by the employees is presented in Table 6.

Table 6: Consumption of fat contents of employees

		Consuming oily items 6 or more days a week	Consuming oily items 3-5 days a week	Consuming oily items less than 3 days a week
No of persons		11	29	9
	Normal	0	0	0
	Borderline	2	3	5
	High	5	26	4
	Very High	4	0	0
Blood pressure level	Low	0	1	1
	Normal	0	2	0
	High	3	6	2
	Very High	4	14	4
	Extremely High	3	7	2

X. Inferences

The people with very high BMI were found to consume more fat items in their diet which makes them physically tardy and prevents them from doing certain tasks in the office and this turned to be a factor for their stress [21].

The 4 people with very high cholesterol level had very high

stress level and were ranked in the top 10 of the TOPSIS analysis. Most of these people had high blood pressure too. The distribution of the mode of transport by the employees is presented in Table 7.

Table 7: Distribution of mode of transport among the selected Employees

Mode of transport		Private (4wheeler)	Private (Auto)	Private (Two wheeler)	Public transport	Bicycle
No of persons		14	7	18	8	2
Cholesterol level	Normal	0	0	0	0	0
	Borderline	1	1	3	2	2
	High	9	6	15	6	0
	Very High	4	0	0	0	0
Blood pressure	Low	0	1	1	0	0
	Normal	0	0	0	1	1
	High	1	3	4	2	1
	Very High	7	2	10	3	0
	Extremely High	6	1	4	1	0

It is seen that the people with high and extremely high cholesterol level preferred private mode of transport.

- Also % of people with very high Blood pressure and extremely high pressure are the ones who travel in cars and two wheelers (Self drive). Traffic could be the main reason for their high blood pressure which in turn causes stress. The characteristics observed from the questionnaire among the highly stressed people in the TOPSIS method [22] [23] [24]
1. Top 20% consume high fat content in their diet.
 2. 78% opt for private transport (mostly cars) to their workplace.
 3. Only 5 of the employees in the stressed level had a morning walk and they were observed to have borderline cholesterol and were ranked above 25 in the TOPSIS method.
 4. More than 60% of the stressed employees had 2 or more children.
 5. 11 of the employees' were having their residence near temple/church and 9 of them were found to be ranked above 25 and 2 were above 20th rank.
 6. None of these 49 employees had the habit of practicing yoga or meditation regularly.
 7. 29 of the employees i.e. 60% of the employees stressed lived in rented houses.
 8. 24 people lived in city limits most of them were found to be in the top of the stressed list on comparing to those with residence outside the city limits.
 9. Only 9 of the employees had the habit of going out to films or parks in Sundays/ holidays and they were all found to be ranked above 25 in the top 49.
 10. 75% of the stressed employees had the habit of either smoking or consuming alcohol.

XI. Conclusion

1. The major stress indicators of the respondents were found to be their BMI level, Blood pressure and cholesterol content.
2. Consuming low cholesterol content diet, having a morning walk, involving in stress relieving activities[25] like films, tours and doing meditation and yoga were the common habits missing among the highly stressed people.
3. These activities when followed were found to reduce the stress level of the employees.

XII. Suggestions

1. Introduce 'PRANAYAM' (brain stilling and control of vital force) as a holistic managerial to deal with occupational strategy.
2. Encourage open channel of communication to deal work related stress.
3. Provide counseling on work related and personnel problems of the employee.
4. One should have a good time management, by having a balanced schedule and plan regular breaks and try to reach the place earlier ,and don't over commit.
5. PROCRASTINATION-finding ways to care of the piled up stuff.
6. Simplify our life to reduce stress.
7. Walking 20 minutes a day helps in keeping the nervous system calm and reduces the stress level.
8. To have supplements wit vitamins and minerals.
9. Start usage of herbal products which helps in treatment of nervous system, insomnia, restlessness and chest pains and to increase deep sleep.

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- Colds –
- Digestive Upsets –
- Total –

How many times will you consume fat contents in your diet in a week?

- 6 or more
- 3-5 days
- Less than 3 days

What is your mode of transport to the office?

- Four wheeler
- Auto
- Two-wheeler
- Public transport
- Bicycle

Annexure 1:

Real Time Survey: Stress Management using Optimization Tool

How do you Show your stress?

Using the following scale, rate your current/recent experience of each of these symptoms.

Always	Almost always	Most of the times	Sometimes	Rarely	Never
5	4	3	2	1	0

- Headaches –
- Insomnia –
- Fatigue –
- Anxiety –
- Can't Breathe –
- Accident Prone –