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Implementing stress management techniques among middle level managers in construction industries

R.Praveen[(1)]
PG Scholar, Department of Civil Engineering
Kongu Engineering College,
Perundurai, Erode, India.
Smilepraveen94@gmail.com

N.Nandhini[(2)]
Assistant Professor, Department of Civil Engineering
Kongu Engineering College,
Perundurai, Erode, India.
nandhinin@kongu.ac.in

Abstract— A Site Engineer is exceptionally vital for a Construction venture. The duties of a Site Engineer are wide as he should give adequate guidance and supervision when they are any specialized issue, legitimate administration and furthermore readiness of day by day advances reports of Construction works. The site engineers must possess certain basic roles and responsibilities for the execution and completion of the project. Within this contexts, the site engineers in the construction project are highly stressful due to conflict of boundary condition, Inadequate room for innovation and bureaucracy purpose, Communication problem among project team members, Poor crisis management mechanisms, Shift works and Over workloads are involved during implementing the plan in Construction sites. The main Objectives of my project is to identify the major Stressors influencing the stress through Questionnaire survey conducted among Site Engineers at various construction sites and to analyzing those factors using Statistical Tools. Finally to implement some Stress Management Techniques to manage these stress and also recommended some personal characteristics to improve their leadership level in construction projects.

Key Words- Middle-Level Managers, Stress, Stressors, Stress Management Techniques, Construction Industry.

I. INTRODUCTION

The construction industry has been long recognized as stressful sectors. Around 70% of building professionals suffered from stress, nervousness, or sadness as a direct result of functioning in the erection industry. The role the construction site engineer plays is elemental to the success of their organization. Site engineers carry out one of the toughest and hardest jobs in the construction process. Site engineers are generally considered key persons in the success of a construction project. The role of site engineer includes not only scheduling, organizing, and supervising the project team and the progress of work in construction projects. Site management is well thought-out by a high work overload, long working hours, and many inconsistent parties to deal with including the management, the subcontractors, the subordinates, the client, etc. Every single judgment is prepared by site engineers has a through an impact on time, expenditure, quality, and final success of a construction project, it is unavoidable that site engineers are subject to the great contract of stress in their job. This characteristic of the work makes it extremely prone to stress. Hence, stress is painstaking to have a negative crash on the soul. However, stress is not harmful. "Without stress, there would be no life. "The stimulus of stress is essential for every successful experience, as it is always accompanied by motivation. Stress can have severe implications for both the individual's healthiness and performance. In terms of health, the relationship between stress and different serious illnesses has been scientifically established. The author asserted that managers suffer extreme physiological symptoms from stress at work, which compel them to premature retirement from work before they have had the opportunity to complete their potential organizational life. In terms of performance, decision making, decision making under stress becomes faulty. Based on the nature of construction site engineer and the literature on stress, this study aims to investigate the impact of different types of stress occur on-site management in construction industry.

II. STRESS MANAGEMENT

Stress in the workplace can be managed using a variety of tools and techniques at the number of levels. At an individual level a focus on diet, exercise, cognitive techniques, and relaxation training. At team level, these can include supervisory training, team building and sensitivity training that could focus on issues of racism. At structural or managerial level technique might focus on modifying job time

or budge, plummeting physical hazards, humanizing occupation ladders, modifying the utilize of guidance and expertise, job turning round and improvement and empowerment.

III. OBJECTIVES

- To study the problems faced by site engineer in the construction industry.
- To identify the stressors influencing stress.
- To implement some stress management techniques among site engineers.
- Recommend some personal characteristics to improve their leadership skills on-site management in construction industry.

IV. LITERATURE REVIEW

1) Kamardeen et al examined the synchronous impact of six individual qualities of development expert, for example, sex, age, occupation, wage, conjugal status, identity characteristics on business-related mental sickness. At long last they leading the specific program to lessen the work worry in the development industry.

2) Haydam et al concentrated on the experience of worry in the Civil Engineering segments of the development business and furthermore concentrating on contractual worker's site operator and foreman working in the NMBM and the particular stressors that influence them the commonness of side effects of strain, stress and gloom.

3) Defrank et al actualize some pressure administration methods among Construction Industry in the UK. To diminish general pressure while dealing with the site in the development industry.

4) Lamar et al recognized three pressure in particular employment push, enthusiastic pressure, the physical pressure in light of the fact that the site administrator and specialists are working extended periods and more convoluted because of the absence of assets. Diminish these worries to actualize some pressure administration program and to fulfill their necessities.

5) Gut et al concentrated on South Africa individuals (high contrast) had part of work environment worry in the development industry. By utilizing study, badgering and segregation were found to connect with the high apparent level of work worry, to diminish these components to execute as a feature of more extensive pressure administration programs among site administration people.

6) Edwards et al concentrated on word related pressure influences the wellbeing of development experts. Absolutely 7 sorts of wellsprings of stress is confined by experienced experts in South Africa are working to tight due dates, work extend periods of time, insufficient time to adjust with family, kept occupied and possessed, enhance their abilities, buckle down.

7) Styfire et al speak to the Site supervisors confront some basic circumstance in the development industry. So they examination these variables and actualize some emergency administration, inescapable site chief while thinking about exhausted to lessen the pressure.

8) Dwindle et al examine some universal review of pressure and psychological well-being overview in Australia they distinguished some subscales are work pressure, situational stress, individual or self pressure and they measure the anxiety by utilizing pressure scale. Execute some pressure administration program to decrease the anxiety.

9) Frases et al actualize some individual qualities to enhance their administration abilities in development destinations. They can enhance their aptitudes while applying the attributes specifically state of development industry and furthermore deal with their pressure.

10) Djebarni et al Studied semi-organized meetings with 71 site directors and examine all the more particularly worried about the effect of three sorts of stressors, specifically manager stretch, work pressure and condition work pressure. In at last some incorporated preparing programs that have been produced to provide food for a full range of pressure related issues.

V. METHODOLOGY

The methodology is carried out accordingly to the objectives of the study. The study includes the literature review and interviews with various site engineers at the construction site. The factors that influence the stressors and its stress were identified from literature review and interviews. Based on these factors questionnaire is prepared and the survey is conducted through Google forms and distributed manually among site engineers. To find the top factors (stressors) that to influence the stress on middle-level managers from various construction sites. And to implement some stress management techniques among site engineers to manage the stress while implementing the plan at construction sites. In this study, questionnaires and personal interview were used as a tool for collecting data for quantitative analysis and qualitative analysis. The cause for using a questionnaire is that the option of responses can be acquired in a structural manner, according to questionnaires are the most common method used to identify the practice of companies. Although designing a questionnaire appears to be relatively simple, it is a complex process. The inquiries must be detailed and chosen precisely and the point of the task should constantly be borne.

VI. STRESSORS INFLUENCING STRESS (FACTORS)

Stressors have the physical, synthetic and mental reaction within the body. Body stressors create involuntary stressors on skin, skeleton, tendons, ligaments, brute force, and mental strain that cause tissue deformity and in surprising basis tissue disappointment. Substance stressor likewise creates biomechanical reactions related to digestion and tissues repair. Physical stressors may create torment and weaken work execution. Ceaseless torment and debilitation requiring medicinal consideration may come about because of outrageous physical stressors. The accompanying stressors are recognized amid the site visit at different Construction sites.

1) WORK STRESS

- Communication problems among workers
- Working long hours
- Conflict boundary condition
- Staffing Problem

2) WORKPLACE STRESS

- Over Compensation specially for female engineer
- Inadequate room for innovation and bureaucracy

3) EMOTIONAL STRESS
- Failure of work
- Communication problem among project team members

4) PHYSIOLOGICAL STRESS
- Physical Hazards
- Unpredictable condition

5) MANAGERIAL STRESS
- Poor crisis management mechanism
- Urgency decision without adequate information

6) ROLE BASED STRESS
- Fragmentation of work
- Very low income when compare to other job

7) OCCUPATIONAL STRESS
- Hostility work environment
- Night shift
- Authority's imbalance

8) JOB STRESS
- Over workload
- Poor group relationship

9) Environmental Job stress
- Any unpredictable failure
- Job complexity

VII. QUESTIONNAIRE SURVEY

The questionnaire was prepared and distributed among site engineers of different construction sites in order to grasp their views regarding the factors (stressors) influencing the stress among middle level managers at construction sites. The views of respondents are collected through five point scale rating system. The following table shows the details of the questionnaire survey conducted among various construction site engineers.

Table.1 Response Rate

DESCRIPTION	SURVEY COLLECTED
Questionnaire Distributed	189
Response Collected	152
Male Respondents	133
Female Respondents	19
Respondent Rate	83%

VIII. RESULTS

In this survey totally 189 questionnaires were distributed to the targeted respondent in order to identify the factors (stressors) influencing stress among site engineers in construction sites. In those 152 responses has been received. The responses rate of this survey was 83%. The response rate will be explained in the below table and chart by using SPSS software and implement some stress management techniques to manage these stress while managing the site.

1. RELIABILITY ANALYSIS

Prior to data analysis, the reliability of data was assessed using Cronbach's Alpha method. The Cronbach's Alpha is the most common measure used to test the reliability, which gives us a measure of internal consistency. Our results showed Cronbach's alpha as 0.826, which indicates a high level of internal consistency for our scale as recommended by Nunnaly (1978). The Cronbach's alpha obtained for the data collected through questionnaire survey is given in the following table

Table.2 Reliability Analysis

Cronbach's alpha	No. of items
0.826	30

2. DESCRIPTIVE STATICTICS

Table.3 Demographic Profile of respondent

sl.no	demographic profile of respondent	category	no. of respondent	%
1	Gender	Male	133	87.5
		Female	19	12.5
2	Experience	0-1 year	55	36.2
		1-3 year	67	44.1
		3-5 year	18	11.8
		5 & above	12	7.9
3	Qualification	Engineering	138	90.8
		Diploma	14	9.2
4	Designation	Site engineer	152	100
5	Age	19-21 year	13	8.6
		22-25 year	116	76.3
		25 & above year	23	15.1
6	Salary	5000-10000	45	29.6
		10000-15000	59	38.8
		Above 15000	48	31.6

In this analysis totally 189 questionnaires were distributed in that 152 response were collected. In gender 133 site engineer are comes under the male category and the response rate of this male site engineers was 87.5% and 19 site engineer are comes under female category and the response rate of this female site engineer was 12.5%. In that 152 response 8.6% of site engineer are belong in 19-21 year of age people. 76.3% of site engineer are belong in 22-25 year of age people and 15.1% of site engineer are belong in 25&above of age people. In Gender around 87.5% of site engineer are belong in male respondent and 12.5% of site engineer are belong in female respondent. In Experience 36.2% of site engineer are belong in 0-1 year of experience and 44.1% of site engineer are belong in 1-3 year of experience, 11.1% of site engineer are belong in 3-5 year of experience and 7.9% of site engineer are belong in 5 and above year of experience. In Qualification 90.8% of site engineer are belong in engineering category and 9.2% of site engineer are belong in Diploma Category. In salary 45 site engineers are belonging under the category of

rupees 5000 to 10000 and the response rate of this site engineer's was 29.6% and 59 site engineer's are belonging under the category of rupees 10000 to 15000 and the response rate of this site engineer's was 38.3% also 48 site engineer's are belonging under the category of rupees 15000 and above and the response rate of this site engineer's was 31.6%.

3. PRINCIPAL COMPONENTS ANALYSIS

The main aim of this analysis is to reduce any larger set of variables into a smaller set of principle components. The KMO measure of sampling adequacy is implemented in our study, which gave an acceptable result of 0.710.Thereby all independent variables used for questionnaire survey are correlated and the variable that closely represent the construct are included, leaving others and a new measurement scale was framed by shortening the existing scale to major 11 variables as given in the table

Table.3 Principle Component Analysis

The narrated eleven dimensions of construction site engineer's stressors explained to the extent of 65.605 percent. The most important perceived stress among the construction site engineers is communication problem' since its respective Eigen value is 5.112, which consists of 5 variables. Since the second and third factors are staffing problem, Inadequate room their respective Eigen value is 1.993 and 1.873 percent respectively. The variance explained by these factors is 6.644 and 6.244 percent respectively. The next important factor is shift work and over workload which consists of 4 and 2 variables respectively. These two stress factors explained to the extent of 5.406 and 5.156 percent respectively. The Tenth and Eleventh stress is Unpredictable failure and Job complexity which consists of three and two variables respectively. Since the respective Eigen value are 1.096 and 1.023 respectively.

Stressors	No. of variables	Eigen values	Percentage variance	Cumulative Percentage variance
Communication	5	5.112	17.038	17.038
Staffing problem	4	1.993	6.644	23.682
Inadequate room	5	1.873	6.244	29.926
Shift work	4	1.622	5.406	35.332
Over workload	2	1.557	5.156	40.488
Climatic condition	2	1.476	4.887	45.375
Poor crisis management mechanism	2	1.396	4.587	49.962
Work fragmentation	3	1.254	4.320	54.282
Low income	3	1.116	4.099	58.373
Unpredictable failure	3	1.096	3.848	62.220
Job complexity	2	1.023	3.385	65.605
KMO Measures of sampling Adequacy:0.710		Bartlett's test of sphericity: Chi-Square value:910.455		

4. MEAN SCORE ANALYSIS

Table.4 Mean Score Analysis

Stressors	F value	significance
Communication problem	1.098	0.360
Staffing problem	0.587	0.673
Inadequate room	2.788	0.029
Shift work	1.875	0.118
Over workload	0.612	0.655
Climatic condition	0.973	0.424
Poor crisis management mechanism	0.625	0.645
Work fragmentation	3.201	0.015
Low income	0.716	0.582
Unpredictable failure	0.456	0.768
Job complexity	0.891	0.471

The descriptive statistical analysis is performed to obtain the mean score for 11 identified major variables. The frequency analysis method was carried out for descriptive statistical analysis. The results shows that the low incomes when compared to other job, fragmentation of work have highest mean scores of 3.83 and 3.75 in stressors influencing the stress of middle level managers in construction industry. It is then followed by poor crisis management mechanism (3.70), communication problem (3.63), over workload (3.48), shift works (3.46), unpredictable failure (3.45), inadequate room (3.43), job complexity (3.42), staffing problem (3.36).

5. ONE-WAY ANOVA

Table.5 One-way Anova

Further the research is carried out with one-way analysis of variance (ANOVA) to determine whether there is any significant difference between the means of variables provided

Stressors	Mean score	Standard deviation	Co efficient of variance
Communication problem	3.69	0.951	0.904
Staffing problem	3.36	1.019	1.039
Inadequate room	3.43	1.160	1.346
Shift work	3.46	1.073	1.151
Over workload	3.48	1.023	1.046
Climatic condition	3.38	1.015	1.031
Poor crisis management mechanism	3.70	1.004	1.007
Work fragmentation	3.75	1.152	1.328
Low income	3.83	1.132	1.282
Unpredictable failure	3.45	0.955	0.912
Job complexity	3.42	1.026	1.053

by the respondents namely site engineers, project members, and site managers. The one-way analysis is carried out for the identified 11 major factors and the results are summarized as follows. From the above result it is evident that inadequate room for innovation and bureaucracy purpose and fragmentation of work having significance level .029 and .015 which are below .05 are therefore said to have statistically significant difference in their means among the 11 major variables. Therefore the result shows that the perception of site engineers, project members and site managers significantly varies for innovation and bureaucracy purpose and fragmentation of work.

6. DISCUSSIONS

The above results were done by using SPSS statistical tool. The result shows that the major 11 factors are identified by using extraction of factors in principle component analysis. In that we conclude the above 11 major factors (stressors) to influencing the stress of site engineers while managing the site. To manage or reduce these stress while implementing some stress management techniques among site engineers in construction industry. Around 15 to 20 construction site the following stress management techniques will be implemented to manage the stress.

IX. STRESS MANAGEMENT TECHNIQUES

Around 20 construction industry the stress management techniques will be implemented among construction site engineers. To manage these stress some stress management techniques will be adopted among site engineers. The following stress management techniques were found with the help of both literature studies and Psychologist.

- Stress education training
- Keep fit programmes
- Relaxation training and counselling
- Stress management programmes or workshops
- Training or coaching programmes
- Biofeedback
- Meditation
- Time management
- Stress audit
- Participation in planning and decision making

After implementation the survey will be done in after 15 days of stress management techniques implement. And to compare these results of both before and after implementation of techniques. The following results shows that the after implementing stress management techniques the stress level have been decreased.

Table.6 Stress Management Techniques After Implementation

Stressors	0–15 days	16–30 days	31–45 days
Communication problem	37.6	31.1	21.3
Staffing problem	30.9	24.8	19.8
Inadequate room	26.3	19.1	18.2
Shift work	32.9	28.9	25.9
Over workload	33.6	25.6	21.1
Climatic condition	32.9	22.5	17.5
Poor crisis management	35.5	29.4	20.8
Work fragmentation	30.3	21.3	17.9
Low income	35.5	32.9	29.1
Unpredictable failure	29.6	22.3	16.4
Job complexity	23.7	19.1	15.2

After implementing the stress management techniques the 15 days of results shows that the stress level of communication problem was 37.6% but it can be reduced to after 45 days while adopting this techniques while execute the plan the stress level of 45 days was 21.3%. In poor crisis management mechanism the 15 days of results shows that the stress level was 35.5% but it can be reduced to adopted these techniques in to 45 days the stress level was 20.8%. In work fragmentation the 15 days of results from implementing the stress management techniques the stress level was 30.3% but it can be reduced 45 days the stress level was 17.9%.

X. CONCLUSION

In Construction sectors the Site Engineers feels 90% of stress will arise while execute the plan at Construction sites. Because the Site Engineers is the only persons to spend more times than the management persons. This research has identified and critically analyzed the 11 major factors that influencing the stress of middle level managers at Construction sites namely Communication problem, Staffing problem, Inadequate room for innovation and bureaucracy purpose, Shift work, Over workload, Climatic condition, Poor Crisis management mechanisms, Fragmentation of work, Very low income when compared to other job, Unpredictable failure, Job complexity. The study found that the variable Low income and fragmentation of work showed greater mean scores for stressors influencing stress of middle level managers in construction industry. Further One-way analysis has been carried out and the results revealed that there is a significant difference in the perception of Construction Site Engineers, Project Managers, Site Managers regarding the variables of inadequate room for innovation and bureaucracy purpose and fragmentation of work. Finally to reduce or manage these stress to implement some stress management techniques among Construction Site Engineers. The results shows in this table (6) the site engineers feels the stress will easily manageable while adopting the stress management techniques in construction industry.

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