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Work Stress among Cement Manufacturing Workers of Kashmir Division: An Empirical Study

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Keywords: *work stress, qualifications, workers, cement industry.*

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Work Stress among Cement Manufacturing Workers of Kashmir Division: An Empirical Study

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Abstract- Cement Manufacturing Industry is being considered as one of the major sources of revenue in Kashmir division after the Tourism industry. But the performance of this industry has been equally under the threat because of rapidly increasing work stress which has become a huge challenge for the employers globally, as the increasing levels of stress results into the lower productivity, increased absenteeism and assortment of other employee tribulations at the work place. Aim: The aim of this paper was to investigate as to which extent the demographic variables (i.e. Qualification, Length of tenure and marital status) influence the work stress of cement manufacturing workers in Kashmir division. Methods: The sample size consists total of 300 workers, 150 workers were selected from JK Cements Ltd. and 150 from the Khyber Cements Pvt. Ltd. The data was analyzed with help of SPSS-20 software for testing of hypothesis. The correlation test was applied to measure the relationship between work stress and contents of job. Similarly, multiple regression tests were used for investigating the origin and effect relationship between predictor variables and reason variable and to check the impact of demographics t-test, f-test was used. Conclusions: Study revealed that among factory workers unmarried workers were experiencing relatively more stress as compared to their married counterparts. Also, workers possessing the least educational qualification experience the higher levels of stress as compared to the workers possessing relatively higher educational qualifications. Further study revealed that, Workers with tenure of 0-09 years were experiencing the higher levels of stress compared to those who were possessing the tenure of 30& above years.

Keywords: work stress, qualifications, workers, cement industry.

I. Introduction

Cement manufacturing industry of India is the second largest producer of cement in the world and its contribution is quite high in national GDP. India is producing 350 million tons of cement per year and it is expected to grow to 550 million tons by financial year 2020. India is a vast country, so the development of cities and rural areas will certainly starts from infrastructure and the demand of cement will also increase, Amy Saunders (2014).In Kashmir division also Cement industry plays a very significant role in generating revenue for the government after the Tourism industry. So, it is equally important to increase the productivity of the workers in this very manufacturing sector by increasing the efficiency of workers/employees. In today's competitive and technologically advanced business world it is also believed that , safe and healthy physical work environment will be a great support for the workers in order to carry out their work in a more effective and efficient manner. Moreover, recent studies on physical workplace environment revealed that, uncongenial physical work-environment do decrease the quality of work, especially among workers in industrial sector. The uncongeniality and misfit of physical work-environment indeed affects not only the motivation level of workers, but also the satisfaction level, social relations, performance and health of the workers. Physical work environment can be considered not only as a collection of physical stimuli (i.e. air, noise, temperature, light etc), but also as a physical structure (i.e. size, furniture, hallways, etc) and as a symbolic artifact (i.e. the work setting) Badayai (2010).

II. Review of Literature

Physical work environment also includes contents of job (i.e. Job Demand, control over the job and support from supervisor and co-workers). When the work environment is worse, because of poor work conditions workers will experience more distress, and eventually this will affect their productivity and physical as well as mental health. Researchers have focused their attention on causal factors of stress, stress manifestations, moderators, coping strategies and relaxation techniques adopted by the organizational participants. Work stress is rapidly increasing and has become challenge for the employers because high levels of stress results into low productivity, increased absenteeism and collection of other employee problems like alcoholism, drug abuse, hypertension and host of cardiovascular problems etc Meneze (2005).The study conducted by Parks (2002) reported that stress tends to cause damage that could make work environment to be less conducive for workers; stress results could jeopardize the workers performance and productivity at workplace. Kumar & Madhu (2011) found that factors responsible for work stress are more prominent among the workers. It was also noticed that lack of control among lower category of employees particularly among workers was more as compared to other categories of employees. Joy and Radhakrishnan (2013) found that factors like poor physical environment, no role in

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decision making, dual career, threat to job security, boring repetitive work, personal / family problems, social / physical isolation, etc are some of the major causes of stress at the work-place among the operational level workers. Pilar et.al (2013) revealed that, men have showed only one dimension i.e. Job demands as a significant stressor (quantitative demands), whose effect on job stress was weakened slightly by the direct effects of control and support. With women, in contrast, emotional and intellectual aspects (qualitative demands) and were also found statistically significant. Moreover, social support has a greater weakening result on the levels of work stress in women than in men and also suggests that, by applying the Job Demand Control and Support model in function of the gender will contribute to a superior perceptive of how to reduce the levels of job stress in both men and women, helping the design of more effective policies in this area.

The above studies go a long way in helping to understand the work environment of the manufacturing workers and the possible reasons behind their feelings of stress at work. Besides, this there is a great risk to health and other hazards, physical injuries etc because of low job control, high job demands and low social support at work. Since, the focus of our study is on cement industry so; in order to have a deeper insight into some important researches conducted over the years on the cement industry are reviewed as under.

III. Studies on Cement Industry

Today Cement industry has gained attention of the researchers throughout the world which in turn made the cement industry an important subject of the research endeavor, Rafiq et.al (2015). In line with this phenomenon a study conducted by IYAWE et.al (2000) to investigate the influence of age, nature of job and duration of employment on the blood pressure of the workers of a cement factory in Nigeria. The results revealed Blood pressure increased with age and increase in blood pressure was not influenced by "cement related jobs" in the factory. Newly employed workers were found to have higher mean systolic and diastolic pressures than others. Shields, (2006) revealed stress and depression in women was reported higher compared to the male counterparts, also low levels of Co-workers support were associated with higher causes of depression and stress among men. In the same way, Mahdad, (2002) and Saatchi (2008) declared that mental health problem of employees was the main hazard for organizational productivity in cement industry of Iran. Various studies conducted, for example (Ahola, 2009; Shields, 2006; Haslam et al.2005; Boya et al. 2008; Takada et al. 2009; Stoetzer et al.2009; Date et al .2009; Wieelaw et al. 2008) revealed that depression and anxiety of employees have a direct relationship with job stress, impaired work performance, safety, lifestyle factors, working environment, problematic interpersonal relationship at work, long working hours per day and finally psychological work exposures. Jungwee Park (2007), found that married workers were likely to have active and lower- job strains than never-married workers. But, this was contrary to the findings of Chandra Mohan et.al (2013) which inferred that married employees comparatively experience higher stress than unmarried.

IV. Need for the Study

In view of the extant research review cited above it is evident that, numerous studies have been conducted to identify the factors causing work stress among workers of manufacturing industries and Job Demand-Control-Support (JDCS) model is one of the most widely used work stress model related to the contents of work and helps to measure health problems especially, related to heart diseases, mental distress, physical injuries etc among the factory workers in various manufacturing industries. But, very few studies have been conducted on the manufacturing workers whether nationally or internationally and no study has been carried out so far by using the Karasek's (DCS) Model particularly over the Cement Industry workers to check the levels of stress in relation with demographic variables in Kashmir division of J&K State.

V. Objectives of the Study

The present study has been designed to find out the contributory factors leading to stress in relation to their demographic variables by using the work stress questionnaire developed by Lambert et.al. (2006) and Karasek's (JDCS) Model (1979) among the workers of Cement Industry of Kashmir Division with following set of objectives.

1. To critically review the extant literature available on the topic of research undertaken.
2. To study the demographic profile of the respondents.
3. To make a comparative assessment of work stress on the basis of demographic variables.
4. To determine the co-relation between work stress and Contents of work of the sample study respondents.
5. To provide suggestions on the basis of results of the study and the coping strategies in order to minimize the levels of stress among the respondents of the sample study organizations.

VI. Research Hypotheses

H1: "There is no significant difference between the levels of stress experienced by the sample respondents on the basis of their marital status"

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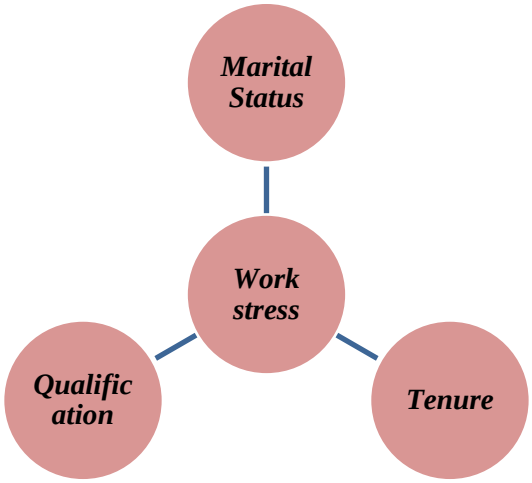
H2: "There is a significant difference between the levels of stress experienced by the sample respondents on the basis of their qualification"

H3: "There is a significant difference between the levels of stress experienced by the sample respondents on the basis of their work tenure"

VII. Conceptual Model of the Study



The diagram showing the hypothetical factors of work stress among manufacturing worker

VIII. Research Methodology

For the present study researcher adopted the Job Content Questionnaire which was developed by Karasek, (1979) & Johnson (1988) for measuring Job Demand, Control and Support and for measuring work Stress a Questionnaire developed by Lambert et.al (2006) was adopted. In the state of J&K two leading cement manufacturing organizations were selected for the present study namely JK Cements Ltd. and the other one namely Khyber cements Pvt. Ltd. Apart from convenience based sampling method the above mentioned two organizations have also been selected on the basis of their dominance in terms of their market share in the state of J&K.

a) Sample Design

Present study constitutes a sample selected at the operational level (factory workers). Proportionate sample method was chosen for the present study (i.e. Total population of workers in each organization/Total population of both the organizations*Sample size calculated by using sample size calculator). The sample size was restricted to300 workers which were selected from the sample organizations.

b) Instrument Reliability

In order to check the reliability of the Instrument in our settings, the responses were received from the (50) operational level workers, the correlation between the items of the various dimensions were calculated by using SPSS version 20. The Cronbach's alpha coefficient for all the dimensions are revealed in table (1) shown as under;

Table 1 : Cronbach's Alpha Coefficients (α) of the *JCQ Subscale (N=50)

Scale No. of Items	Cronbach's (α) coefficient
Stress (4)	0.863
Skill-Discretion (4)	0.749
Job-Authority (7)	0.875
Job-Demand (4)	0.756
Supervisory-Support (8)	0.734
Coworkers-Support (5)	0.854
Overall Realiablity	0.940

**JCQ=JOB CONTENT QUESTIONNAIRE*

Note: This indicates a good internal reliability, based on average inter-item correlation.

IX. Results and Discussions

a) Differences of Means Test on the basis of marital status

Independent sample t- test was conducted as reflected in Table (2), mean score of stress for married workers was 2.54 against their unmarried counterparts where mean score was 3.01, which revealed unmarried workers experience relatively more stress. And the difference of mean scores was statistically insignificant. This supports the work of Jungwee Park (2007), who found that married workers were likely to have active and lower- job strains than unmarried workers. But, was contrary to the findings of Chandra Mohan et.al (2013) which inferred that married employees comparatively experience higher stress than unmarried.

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Table 2 : Independent sample T-test for comparisons of stress in terms of Marital Status

Dimension	M. STATUS*	**N	Mean	t-value	Sig.
Stress	Married	275	2.5473	2.554	.016
	Unmarried	25	3.0100		

*M.STATUS= Marital Status, **N=Number of Workers in each category

* Significant at 5% level (P<0.05)

b) *One-way ANOVA for multiple comparisons of stress levels in terms of Qualification*

As revealed by Table (3) mean score 2.87, imply that workers possessing qualification between 1st -5th were most stressful, followed by workers who were non-educated with mean score 2.62. As compared to workers with high qualifications (i.e., PG & above) with mean score 2.39 were facing least work stress. Which supports the work of (Bano & Jha 2012; Finkelstein, et.al. 2007; Gallo & Matthews, 2003) who found that lower the levels of education, higher will be the levels of stress. The results of One-Way ANOVA revealed the difference was statistically insignificant.

Table 3 : One-way ANOVA for stress levels in terms of Qualification

Dimension	Qualifications	*N	Mean	Std. Deviation	f-value	Sig.
Stress	Non-educated	106	2.6294	.89321	1.515	0.198
	1st-5th	31	2.8710	.88240		
	6th-10th	114	2.5142	.73746		
	11th-final year	23	2.5326	.87355		
	P.G & above	26	2.3942	.93588		

*N=Number of Workers in each category,

* Significant at 5% level (P<0.05)

c) *One-way ANOVA for multiple comparisons of stress levels in terms of tenure*

Table (4) revealed that workers having tenure between 0-09 years were experiencing more levels of stress with mean score 2.78, reflected that newly joined workers or those who were in their initial years of service were experiencing higher levels of stress compared to workers having tenure of 30 & above years with mean score 2.45. This partly supports the findings of Gallo & Matthews, (2003) that as people grow older with their job they experience less levels of stress. Analysis of variance revealed that, difference was statistically significant.

Table 4 : One-way ANOVA for stress levels in terms of Tenure

Dimension	Tenure	*N	Mean	Std. Deviation	F-value	Sig.
Stress	0-9	47	2.7862	.91169	2.720	0.450
	10-19	143	2.6618	.74336		
	20-29	76	2.6064	.77800		
	30&above	34	2.4545	. 83689		
	Total	300	2.5858	.84522		

*N=Number of workers in each category

* Significant at 5% level (P<0.05)

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d) Research Hypotheses Testing Results

The Independent sample t-test and the One-way ANOVA test also helps to test the above set hypothesis as under:

H	*Hypothesis*	*P-Value*	*Supporting/Not-supporting*
1	*"There is no significant difference between the levels of stress experienced by the sample respondents on the basis of their marital status"*	*0.016*	*Supporting*
2	*"There is a significant difference between the levels of stress experienced by the sample respondents on the basis of their qualification"*	*0.198*	*Not- supporting*
3	*"There is a significant difference between the levels of stress experienced by the sample respondents on the basis of their work tenure"*	*0.450*	*Not- supporting*

e) Bivariate Correlation Analysis of various Dimensions

An analysis of data contained in Table (6) below revealed that work stress was positively associated with Job Authority (r = 0.200**), revealing increase in this factor will lead to increase in stress levels of workers and vice-versa, favoring the findings of Ben (2007). Whereas, Supervisory support (r = -0.295**) and Coworkers support (r = -0.191**) found to be negatively correlated with work stress which means that any decrease in social support will increase the levels of stress among the workers or vice-versa in proportion of their correlation. This supports the findings of Raeda, (2003) that stress is negatively associated with support from coworkers and supervisors. And, it was also found that Job Demand (r = -0.081) and Skill Discretion (r = 0.042) revealed no correlation of these two factors with the levels of stress, that does not support the findings of (Karasek & Theorell, 1990, Cox et.el, 2000 & WHO Report, 2007). Since all the independent variables except skill discretion & job demand were found to be associated with work Stress it becomes imperative to understand which variable is having a deeper and significant impact over the work stress. For this purpose it becomes necessary to perform the regression analysis of the data.

Table 6 : Correlations Matrix among various dimensions

Dimensions		*Stress*	*Skill Discretion*	*Job Demand*	*Supervisory Support*	*Coworker Support*	*Job Authority*
Stress	*Pearson Correlation*	*1*					
	Sig. (2-tailed)						
Skill Discretion	*Pearson Correlation*	*.042*	*1*				
	Sig. (2-tailed)	*.467*					
Job demand	*Pearson Correlation*	*-.081*	*.013*	*1*			
	Sig. (2-tailed)	*.162*	*.824*				
Supervisory Support	*Pearson Correlation*	*-.295***	*-.022*	*.089*	*1*		
	Sig. (2-tailed)	*.000*	*.700*	*.125*			
Coworker Support	*Pearson Correlation*	*-.191***	*.095*	*.132*	*.121*	*1*	

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	Sig. (2-tailed)	*.001*	*.101*	*.022*	*.037*		
Job Authority	*Pearson Correlation*	*.200***	*.016*	*-.110*	*-.021*	*-.194*	*1*
	Sig. (2-tailed)	*.001*	*.789*	*.058*	*.722*	*.001*	

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

f) Regression Analysis

Table (7) revealed that value of R2 shows that approximately 29% of the variation of work stress is explained by the job contents (i.e. Skill Discretion, Job Authority, Job Demand, Supervisory Support & Coworkers Support).The significance of model in terms of overall fit is expressed by F = 6.684 (Table 8). The Beta values of 0.166 (Table 9) revealed, Job authority shows there is a significant ($p<0.05$) and positive impact of this factors over the work stress. Whereas, Beta value of -0.273 & -0.127, reflects there is a significant ($p>0.05$) but negative impact of supervisory support & coworkers support over work stress. However, Beta value of skill discretion 0.046 & job demand -0.022 reveals there is no significant ($p>0.05$) impact of these two factors on work stress. In other words job authority; coworker support and supervisory support are much useful to predict the work stress of cement factory workers of Kashmir Division as compared to job demand & skill discretion.

Table 7 : Regression Analysis Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	*.533[a]*	*.285*	*.242*	*.5167*

a) Predictors: (constant), job authority, skill discretion, supervisory support, job demand, coworker support.

Table 8 : ANOVA a

Model		Sum of Squares	Df	Mean Square	F Value	Sig.
1	Regression	*8.923*	*5*	*1.785*	*6.684*	*.000[b]*
	Residual	*22.427*	*84*	*.267*		
	Total	*31.350*	*89*			

a. Dependent Variable: STRESS

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b) *Predictors: (Constant), Job Authority, Skill Discretion, Supervisory Support, Job Demand, Coworker Support*

Table 9 : Coefficients a

Model		Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.
		B	Std. Error	Beta		
1	(Constant)	*4.472*	*.919*		*4.865*	*.000*
	Skill – Discretion	*.126*	*.150*	*.046*	*.842*	*.400*
	Job – Demand	*-.043*	*.106*	*-.022*	*-.406*	*.685*
	Supervisory –Support	*-.892*	*.178*	*-.273*	*-5.007*	*.000*
	Coworker- Support	*-.209*	*.092*	*-.127*	*-2.270*	*.024*
	Job – Authority	*.524*	*.174*	*.166*	*3.006*	*.003*

X. Conclusions and Suggetions

The in-depth analysis of work stress, along with the contents of job which are Job Demand, Control & Support revealed the following findings:-

a) *Work-Stress*

- Unmarried workers were experiencing relatively more stress with the mean score of 3.01 compared to their married counterparts with the mean score of 2.54, and were found to be statistically in significant.
- Also, least qualified workers i.e. 1st-5th and non-educated ones were experiencing the higher levels of stress reflecting from the means score of 2.87 as compared to the workers possessing higher qualifications i.e.PG & above and difference was statistically insignificant.
- And, workers having tenure between 0-09 years were experiencing more levels of stress with mean score of 2.78, compared to the workers having tenure of 30&above years with mean score of 2.45 and was statistically significant.
- Whereas, supervisory support & coworkers support were negatively correlated with the job stress as reflected by the (Table 6) which means any decrease in these two factors will lead to increase in job stress and the other two factors namely, job demand and skill discretion did not showed any correlation with job stress at all.
- However regression analysis revealed that job stress was found to be significantly associated with job authority, supervisory support and coworkers support.
- Whereas in regression analysis no correlation was found for skill discretion and job demand with job stress.

b) *Suggestions of the Study*

It is evident from findings of the study that workers were experiencing the visible levels of work stress in both organizations. So, it is very important for the management to make proper use of Stress Management Programs available for the factory level workers in order to control the levels of stress on time.

- There was a high job control among older workers possessing very low qualifications or non-educated ones which should be addressed by the management through proper distribution of job authority on the basis of qualifications & work experience and not on the basis of favoritism and seniority only.
- Lack of social support was found higher among highly qualified workers and also among newly appointees, which means lack of well organized feedback system of organization and relationship gaps among the coworkers as well as with the supervisors.
- Work guidance programmes that could foster prevention of mental disorder, resulting from stress on the job on the part of workers, should also be introduced at the workplace.
- Technological changes, work organization, and job contents should be designed in a way that the workers are not exposed to physical or mental strain leading to illness or accidents.
- Forms of remuneration and the distribution of working hours should also be taken into account while assigning the tasks to the workers.

c) *Limitations of the Study*

As the other studies are not flawless similarly the present study also has certain limitations, which are as under:

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- The present study is specific to the selected organizations of Kashmir Division only.
- Additionally, data was collected from the operational or lower level workers only, while excluding the other levels of the organization.
- Also contents of job and stress were analyzed in relation of demographic variables only.

d) Suggestions for future studies

- It is suggested to carry out the study concerning this topic and industry with some more dimensions.
- It may also be impressed here that in order to enrich the study researcher should go for different levels within an organization.
- And, also the researcher has taken a limited number of demographic variables only, so it suggested add-up some more important variables.

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