

Correlation of Job Stress in Hydro-Survey-2016

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Abstract: The engineers in hydro projects of Nepal at construction sites were studied for their Job Stress. Level of Stress was found as "Moderately Stressed". These six factors of satisfaction scale were found negative correlations with Job Demand sub scale of Stress and Overall Stress. The four subs scales of stress were positively correlated with overall stress. The correlation between Self developed scale and adopted scale (AIS), was moderate (p value + 0.57). Inter-item correlations and correlation between sub scales were found less than 0.5, with few exceptions. This satisfied the discrimination validity. Detail studies on test-retest, validity and psychological responsiveness were recommended for future research.

Job satisfaction was found negative moderate correlation with (p - 0.339 to -0.445) occupational stress. Occupational Stress and Intention to Stay were found moderate negative correlation (-0.332 to -0.442). Job Expectation was found weak (negligible: 0.031) positive correlation with stress. Content Validity was assured by all four sub scales and nine job factors.

Job stress was found association with number of children, Meaning to work and Core Self Evaluation Concept. The new scale of stress was as good as adopted scale with higher value of Cronbach's Alfa on reliability.

Key Words: Job stress, Job Demand, Job Control, Job Resources, Job Support, Job burn out.

1. INTRODUCTION:

Attempts were made to measure job stresses in construction Industry in various parts of the world. An attempt to measure job stress was made in Nepal among the engineers in construction sites of hydro projects. The study measured engineers on job stress with two types of scales. The stress was measured as perceived in past one month using quantitative questionnaire. The scales and subscales were analyzed for various correlations. Results were discussed in this paper. The self developed scale was of 21 items and was divided into four sub scales. The sub scales were named as: Project General (Demand), Project Work (Control), Project Team (Support) and Project Environment (Resources).

1.1 Job Expectation (JE)

Vroom's Expectancy theory assumes that expectation behavior results from conscious choices among alternatives whose purpose it is to maximize pleasure and minimize pain. The relationship between people's expectation at work and their goals is not as simple as it seems to be (Thomson, 1975) [18].

1.2 Job satisfaction (JS)

Robbins (2003) [9] stated that job satisfaction refers to an employee's overall attitude toward his or her job. Job satisfaction is a most important component that encourages a worker to income promotion, recognition and the achievement of other objectives that leads to the feelings of success that infers delight and passion in one's work (Kaliski, 2007) [14]. "The pleasurable emotional state resulting from the perception of one's job as fulfilling or allowing the fulfillment of one's important job values" (Locke and Weiss, 1976) [10].

1.3 Job or Work or Occupational stress (OS)

Arnold and Fieldman, (1986) [1] defines stress as relation of individual with new or threatening factors in their work environment. McGrath (1975) [11] argued moderate level of stress empower people to perform better.

1.4 Organizational Justice (OJ)

Greenberg (1987) introduced the concept of organizational justice with regard to how an employee judges the behavior of the organization and the employee's resulting attitude and behavior. "Organizational justice concerns employees' perceptions of fairness within a company".

1.5 Work-Life Balance (WLB)

"Organizations also need to respect employee's desires to have more time off to pursue their own interests. Implementing work-family policies helps to ease family demands, and by doing so, reduces employee absenteeism and turnover. Initiatives may include telecommuting, flexi time (Baltes, 1999) [2], job-sharing, shorter work weeks and on-site child care centers.

1.6 Overall Intention to leave or Stay (IS) scale

Intention to leave refers to conscious and deliberate willfulness to leave the organization. Job satisfaction and organizational commitment are the two most important factors which play an important role in determining employees' intention to leave their job. (Shrestha & Shrestha, 2012) [17].

1.7 Meaning to Work (MW)

One's work is believed to provide to individual three/four main things: economic growth, social status, sense of belongingness and even a sense of purpose or meaning (Sverko and Vizek-Vidoviac, 1995: Pratt and Ashaforth, 2003) [13]. Meaningful work is as important and perhaps more (O' Brien, 1992: Pratt and Ashaforth, 2003) [12]. Meaning to work has effect on motivation and performance (Roberson, 1990: Pratt and Ashaforth, 2003) [13].

1.8 Core Self Evaluation Concept (CSEC)

CSEC is defined as individual perception about oneself and one's basic evaluation (Packer, 1980: Bono and Judge, 2003) [3]. CSEC is defined as any individual subconscious bottom line evaluations about oneself and evaluations about their abilities (Judge et al, 1997) [7]. Although individuals may have core evaluations in multiple domains (e.g. evaluations of self, evaluations of others, evaluations of the world), early work on core evaluations demonstrated that core self -evaluations were the most important. (Judge, Locke, Durham, & Kluger, 1998)[8]

2. THEORETICAL REVIEW:

2.1 Job Demand Control Model (JDC Model or Theory):

JDC Models: for chronic stress of occupation various contribution were made. This theory states stress is related with demand of job (Job demand) (Caplan, Cabb, French, Haririson, and Pinman, 1985: Peterson, 2009); Perception of Control (Dosyer, Ganster, 1992: Peterson, 2009) [12] and Support and social Support (Coplan et al, 1980; Fisher, 1985; French, 2000: Peterson, 2009). JD-C model (Karasek, 1979: Peterson, 2009) [12] which has the following strength has been the base of this study:

1. This theory recognizes the long term outcome of daily work stress. Work load and work pressure in projects can lead to negative outcome as stress, which can be posited by control and support (Peterson, 2009) [12].
2. This model focuses on environmental stressors within the project setting (Karasek, 1979; Karasek and Theorell, 1990: Peterson, 2009) [13].
3. Views stress as individual reaction (Peterson, 2009) [12], so suitable to apply with CSEC and MW in this study.
4. Teaches individual to handle stresses (Peterson, 2009) [12]; engineers have to learn to handle stresses in sites.
5. Other researches were event focus (Peterson, 2009) [12] but this is overall project environment setting focused and in this study, the event earthquake is not the purpose of study.
6. The psychological demands are linked with psychological illness (Peterson, 2009) [12]. In this study the uses of research is ultimately to relate with outcome like intention to stay.
7. This theory was applied extensively in work places (Peterson, 2009) [12]. After a decade the model was revised as JD-C-S Model (Johnson Hall, 1988; Karasek, 1998; Karasek and Theorell, 1990; Sarget and Tery, 2000; Tery and Jimmieson, 1999: Peterson, 2009)[12]. The Iso-Strain hypothesis states that the highest strain is experienced when perceived job demand are higher and perceived control and support are low (Van de Doef and Maes, 1999: Peterson, 2009). This model is suitable because it has statistically significant, measure of demand and control as well as inclusion of moderator is possible (Peterson, 2009) [12].

2.2 Job Demand – Resources Model (JDR Theory): (Lazarus, 1991; Lazarus and Forman, 1989; Lazarus and Lauding, 2008: Sizilas, 2011) [16]; when job demand is more than available resources then stress rises. Job stress is individual reaction which depends on individual and organizational factors (Montgomery, 1991; Ouyan, 2009: Shrestha and Shrestha, 2012) [17]. French and Caplan (1972) define job stress is related to either job demand a person can not meet or lack of sufficient resources to meet the job needs (Larsen, 2003: Shrestha and Shrestha, 2012) [17].

3. RESEARCH METHODS:

3.1 Instruments:

Self developed 21 items job stress scale was used along with American Institute of Stress (AIS) scale of 8 items. The self developed scale was divided into four sub scales: Project Demand, Project work (Control), Project team (Support) and Project Environment (Resources). For the correlation of Stress Job Satisfaction self developed scale on aspect and Overall Job Satisfaction (OJS) Scale of 5 items (Brayfield and Rothe, 1951: Bono and Judge, 2003 ;) [3] was used. Self developed Scale of Job Expectation (JE) 12 items; Meaning to Scale (MW) Hackman and Oldham, 1975[6] and Core Self Evaluation Concept (CSEC) (Bono and Judge, 2003) [3] and organizational Justice (OJ) 7 item scale of

Choi, 2008 and Masterson, 2001 (Colquitt, 2012) [4], Intention to Leave 2 item scale (1. Mersi and Humphry, 1980 2. Donnelly and Ivanceobhich, 1975: Rahim, 1997: Shrestha and Shrestha, 2012) [17]; were used.

3.2 Reliability and Validity

The study is quantitative, x- sectional study. Population of 500 engineers in various hydro projects over Nepal was surveyed with web base and paper survey with sample size N=219. The analysis was done by SPSS 20.0 version. Reliability test was by Cronbach's Alfa(r) and association was analyzed by Pearson's coefficient. The reliability was tested during Pretest at N=14, at N=65; and N=219. The overall reliability of Cronbach's Alfa good (0.811) was obtained.

3.3 Psychometric Criteria

Table: 1: Psychometric Quality Criteria (Saane et al, 2003) [15].

Internal Consistency Scale	r>0.79 (JE and JS found: 0.863 & 0.924).
Internal consistency in sub scale range	r>0.79
Test Retest range of Scale	r>0.69
Convergent validity Scale	p>0.49
Convergent validity range of sub scales	p>0.49
Discrimination Validity	p< 0.5

Content Validity requires minimum four (4) aspects among eleven (11) work factors (Saane et al, 2003).

4. ANALYSIS AND FINDINGS:

4.1 Job stress was found associated with job expectation (JE), job satisfaction (JS), meaning to work (MW) and Core Self Evaluation Concept (CSEC). Job Stress was associated with number of Children. Surprisingly work life balance (WLB) and organizational justice (OJ) were found no association with Job Stress.

4.2 With Job satisfaction sub scales:

Six factors of job satisfaction, while examining the correlations with four sub scales and overall scale of stress were found as explained below:

"Pay satisfaction" was found Negatively correlated with job demons sub scale (with p value of -0.25 (low significance). Pay has also negative low correlation with overall stress (OS) scale of 21 items (p as -0.241) low association. But with the overall AIS scale:(-0.147) Negative negligible, weaker than overall stress above.

Promotion, Transfer and Career advancement: was negatively associated (with p value of -0.216) low significance with Job demand Stress. OS:-0.241 (low), AIS scale:-0.140 (negligible). Reward and Recognition: With Job demand Stress: No Association. With The overall stress scale of 21 items: Not associated. Which is correct the reward and recognition is not included in self made Job Stress Scale. This confirms the calculation of this analysis is correct. In the same way it confirms the scale developed was valid and reliable. The data collected are also correct. With the overall AIS scale:(-0.248) negative low association with AIS scale this includes "Reward and Recognition" as one of the eight items in the scale. This is another evidence of validity and reliability of this research.

Work load: with Job demands Stress: -0.241(low significance) at 0.001 levels. With the overall stress scale of 21 item Scale: low p value (-0.291) obtained. With the overall AIS scale:(-0.227) negative low significant.

Job security: With Job demands Stress: Negatively associated with p value of -0.195(low significance) at 0.001 levels. Since the item was included in Job demand Sub scale only, so job security is associated with this sub scale only that is what researcher expected. With Project Team sub factor of Stress: No association. With Project Work Sub factor of Stress: No association. With Project Environment: No association. With The overall stress scale of 21 item Scale: low p value (-0.184) obtained. With the overall AIS scale: Not significant. Sigma is zero, so recommended for staggered dots. There was no item on Job security so the result is correct.

The Employer or the Company: With Job demands Stress: No association .With Project Team sub factor of Stress: any association. With Project Work Sub factor of Stress: No association. With Project Environment: Negative low (-0.226) Association. With The overall stress scale of 21 item Scale: low p value (-0.298).With the overall AIS scale: Negatively associated (with p=-0.245) with low significance.

In the same way the four sub scales of stress were found the following associations:

4.3 Correlations between sub scale of Stress:

Job Demand Sub scale: With Project Team sub factor of Stress: negligible (0.19).

With Project Work Sub factor of Stress: low (0.207).

With Project Environment:

low (0.372).

Job demand sub scale has p value less than 0.5 with all these three sub Scales, because as explained reliability and validity these sub factors measure same thing but in different concept. So correlation between these three sub factors (scales) should be positive but less than 0.5 thus results found were correct.

With the overall stress scale of 21 item Scale: moderate correlation of p value (+ 0.633), obtained, which was expected as per theory: job demand was the cause of highest Stress.

With the overall AIS scale:

+0.362 low correlation.

The AIS scale reliability was low in this study and AIS include other factors than job demand. So it was reasonable.

Project Team or Support sub scale:

With Project Work Sub factor of Stress:

negligible (p value 0.171)

Project Environment:

(p=0.136) negligible correlations.

With The overall stress scale of 21 item Scale:

(p value +0.323) low.

With the overall AIS scale:

(+0.156) negligible.

Project Work or Control Sub factor:

With Project Environment:

low p value 0.344.

With The overall stress scale of 21 item Scale:

moderate positive correlation value +0.523.

With the overall AIS scale:

low correlation of +0.348.

Project Environment or Resources:

With The overall stress scale of 21 item Scale:

moderate positive correlation of +0.626.

With the overall AIS scale:

moderate positive correlation of + 0.418.

The p value between all sub scale are less than 0.5 because they all measure stress but in different concept. But the p value with main scale depends on situation, but all positive.

4.4 Test of two types of Stress Scales:

The p value obtained between these two scales is moderate 0.507 which is higher than 0.5. So this proved all validity criteria of a stress scale. Both measured overall stress, so the correlation must be higher than 0.5 as calculated from p value. Both of the scales were giving comparable mean value or level of stress: Moderate level of stress of engineers in hydro projects. Both of the scale had similar distribution of stress. This all prove the validity and reliability of the scales and findings on job stress among engineers in hydro project construction of Nepal.

4.5 Correlation of Dependent Variables:

Correlation was analyzed two times in 4X4 matrix. One was for self developed scale and another was for adopted scales. Both tables were found symmetric showing correlations between expectation, satisfaction, stress and intention to Stay.

Job satisfaction was found negative correlation with moderate value of p - 0.339 nearer to moderate (low) with Occupational stress. Overall Job Satisfaction (OJS) and AIS were found correlated with moderate p value of -0.445.

Occupational Stress and Intention to Stay were found moderate significant negative correlation of p value -0.332(low).

In the same way AIS and IS was correlated with moderate p value of -0.442.

4.6 Inter -Item Correlations

Inside the occupational stress measurement (21 items) scale, such correlations were not found among first five general factors (5) items. The other items were analyzed as correlations between stress sub scales.

In AIS scale "condition at site unpleasant and some times unsafe "with" My job is affecting health and emotional well being" were correlated with p value of 0.543. No other items were correlated with p value higher than 0.5.

In all other tools adopted none of the items were correlated with p value more than 0.5. The correlation between stress scales was already explained.

5. CONCLUSION AND RECOMMENDATION:

The scales satisfied discriminate validity criteria. Because the entire four sub scales of stress were correlated with each other by less than 0.5 value of Pearson's Coefficient. The scale was found satisfied correlations and associations with satisfaction (negative moderate), expectation (positive), and meaning to work and CSEC. Inter-item correlation was found less than 0.5 (p value) which found internal consistency. The correlations with independent variables (satisfaction on: pay, promotion, reward, work load, job security and the employer) were found excellent with all sub scale and scales of stress (negative with reasonable value of p). Content validity of stress scale was satisfied with inclusion of more than nine factors of job. The reliability of self developed stress scale was found > 0.7. The

correlation between Self developed scale and adopted scale e. g. aspect wise stress scale (21 items) and AIS (8 items) was moderate (p value > 0.5). So this proved all validity criteria of self developed scale of stress. Because these both measure overall stress (but in different concept). So the association must be high (higher than 0.5) enough to be compared. The mean, sd. range, distribution was similar to other scales of stress.

The scale of stress developed was found capable of measuring stress among engineers in hydro project construction. Job stress as measured from both scales was found able to predict Intention to Stay as an outcome. Higher expectation could predict higher stress. Higher satisfaction could predict lesser stress. The scale of stress is recommended for test-retest and psychological responsiveness There shall be strength and weakness on stress scales (D'Bruien, 2006) [5]. The scale can be tested for construction engineer as a whole to evaluate the reliability, validity and psychological responsiveness.

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