FACTORS AFFECTING JOB STRESS AMONG IT PROFESSIONALS IN APPAREL INDUSTRY: A CASE STUDY IN SRI LANKA

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ABSTRACT: Occupational stress is the physical and emotional response which occurs when the requirements of the job do not match the capabilities, resources or needs of the worker. Stress affects the employee productivity and the quality of results. Work related Stress is one of the significant issues in IT industry. The concerned problem has been narrowed down by considering only IT professionals in a leading apparel manufacturing company of Sri Lanka. This paper aims at gaining an in-depth understanding of occupational stress among IT professionals in Apparel Industry addressing the questions what causes work related stress and how it affects IT professionals. Contingent upon the fluctuated way of the exploration, a blended philosophy including both subjective and quantitative strategies has been utilized. From the literature review and with the consultation of psychology experts, eight variables were chosen for this research study. A survey was conducted to gather the primary data and SPSS software was utilized to quantify and analyze the factors affecting to the stress of IT professionals of the concerned company. Statistical measures such as mean, standard deviation and regression analysis were applied to measure the relationship among the variables. Three Hundred and Fourteen IT employees responded to the survey who were selected using convenience sampling method. Regression Analysis was applied to identify a relationship between work related stress and stressor variables under 95% level of significance. The outcomes propose that Work load, Work Environment and Work-Family interaction are exceptionally influencing to create stress in IT professionals.

Keywords: Occupational Stress, IT professionals, Apparel industry

1. INTRODUCTION

Stress is defined as harmful physical and emotional effect on a person occurred by various factors. Occupational stress can occur when the requirements of the job do not match the capabilities, resources or needs of the worker (Prabhu, 2015). This has been identified as a significantly increasing problem in the modern world due to its effect on the employee productivity. Though a number of researches has been done regarding occupational stress in other countries, there has been only a few studies conducted in Sri Lanka regarding the same. But only a very few researches found relating to occupational stress among IT professionals and there are no researches found focusing the IT professionals in the apparel industry in Sri Lanka. The apparel business is one of the largest industries in the Sri Lankan economy that occupies a large portion in the labor force of the country. During the past few decades, IT sector has been the driver for continuous growth of this Industry. But it was highlighted that very less attention had been given to the IT sector employees of the apparel industry and to understand their occupational stress. Hence, this study was conducted on the

same and the concerned problem has been narrowed down by considering IT professionals employed in one of the leading companies which is a large scale apparel and textile manufacturing organization headquartered in Sri Lanka. Therefore, main objectives of this study is to find out the key factors which manifest job stress of IT professionals in this company and to examine a relationship between those factors and job stress variable.

Fernando, 2010 studied on occupational stress in apparel industry employees of Sri Lanka, basing 10 apparel factories under Board of Investment. Job Ambiguity, Job Involvement, Culture, Salary and Environment are the considered variables in the study. Data was gathered using questionarries and were evaluated using statistical tools such as percentage analysis, multiple regression analysis, the coefficient of correlation, factor analysis and chi-square. According to the analysis five variables were significantly influenced total stress of workers.

Jayasuriya, 2012 studied the Sri Lankan IT experts focusing subjects like; what causes organizational stress, How it impacts IT experts and the business, what are the levels of stress winning in Sri Lankan IT experts. The examination was a mixed procedure including both subjective and quantitative techniques. Findings revealed that the stress levels are not as high compared to other countries and causes of organizational stress were unique to Sri Lankan context.

Kumar and Madhu, 2012 done a review to examine the impact of elements in charge of work stress among the representatives in the compound Industries in Kerala, India. Primary data collected using a Likert type questionnaires. Reliability of data was tested using Cronbach Alpha Test. Furthermore, and factors were validated confirmatory factor analysis (CFA).

2. METHODOLOGY

Based on the references Fernando,2010, Jayasuriya,2012, Kumar and Madhu,2012 along with the instructions of research specialists, eight factors were selected for this study. They are role conflict (RC), work environment (WE), work load (WL), work relationship (WR), managerial behavior (MB), mental demand (MD), work family interaction (WFI) and career development (CD). These variables were held as independent variables, and "Stress" being the dependent variable.

A questionnaire was developed considering these eight factors and it consisted of three parts namely, first, middle and last draft. The first draft concentrated on six demographic areas such as Job category, Gender, Age, Marital Status, Job Experience and Educational Level. The second draft of the survey consisted of 40 items with eight subscales representing the independent variables. Each

inquiry was of Likert type with five settled options varying from Strongly Disagree to Strongly Agree. Scoring was done using a value ranking from 1 to 5. Finally, 10 questions were included in the last draft to measure the dependent variable which was "Stress". This questionnaire was designed by using AIS survey questionnaire model (Prabhu, 2015) and validated by Cronbach alpha test (Alexopoulos, 2011).

In this study, the above questionnaire was used in data gathering from existing IT employees in the company. According to the statistics obtained from Human Resource division, there are 968 IT Professionals which can be considered as the audience for this study purpose. But as per their instructions it was difficult to accumulate data from the entire population due to various obstacles. Therefore, it was decided to randomly select 314 IT employees using convenience sampling method and they were the final respondents of this study.

For the analysis purposes, primary data gathered from the questionnaire was used.

Based on demographic categorization given in the first draft of the questionnaire, stress levels of the employees were analyzed under descriptive statistics.

A code was developed for each of the response sets in the second draft of the questionnaire, and numerical codes were assigned for each response. These responses were transformed into a progression of numbers and captured using SPSS 16 software for further statistical investigation. Additionally, a correlation matrix was also calculated to measure the linear relationship strength of explanatory variables with response variable. Finally, regression analysis was applied to identify a relationship between work related stress and stressors variables. Following hypothesis test and fitted Multiple Linear Regression model were considered for this analysis. In order to check the significance of coefficients of the variables, test statistic was used under 5% level of significance. Since it is important to examine the appropriateness of the model before drawing conclusions, the researcher also carried out the 'Residual Analysis' to confirm the model being fitted.

H$_0$: There is no relationship between Stress manifest factors and Stress variable ($\beta_j = 0$)

H$_1$: There is a relationship between one or more Stress manifest factors and Stress variable (at least one $\beta_j \neq 0$); where j = 1, 2, 3, 4, 5, 6, 7, 8

Model: Stress = $\beta_0 + \beta_1 RC + \beta_2 MD + \beta_3 WE + \beta_4 MB + \beta_5 WL + \beta_6 CD + \beta_7 WFI + \beta_8 WR + \alpha$; where β_j is the regression coefficient and α is the error term.

3. RESULTS AND DISCUSSION

3.1. RELIABILITY TEST

The reliability of the findings is measured using the Cronbach's alpha value test. An analysis giving a Cronbach's alpha value greater than 0.7 is acceptable and value within 0.8 and 0.9 for a construct is termed as 'good' whilst an alpha value above 0.9 is termed 'excellent' (Alexopoulos, 2011). Cronbach's Alpha test was applied for this study and observed value was 0.723. Which implies that the considered data set in this study were reliable and data can be used for further analysis**.**

3.2. DESCRIPTIVE STATISTICS

Descriptive analysis was carried out for employees using stress level which drives form the questionnaire results under the six sections of in the first draft. In order to measure the stress of employees stress score was used. Stress score was break up to stress levels as given in the Table 1.

Table 1. Stress categorization by the score value

Stress Score	Stress Level
10 to 39	Low
40 to 69	Moderate
Above 70	High

3.2.1. CALCULATIONS OF DEGREE OF STRESS LEVEL

The calculations of the degree of stress level for all the variables are presented in Table 2 along with frequencies and percentages.

*Table 2: The Degree of Total Variables / Overall- Percentage*

Stress Level	Frequency	Percentage
Low	140	44.6%
Moderate	73	23.2%
High	101	32.2%

According to the aggregate score of the respondents, they have been classified into a different levels of stress. Table 2 shows that the highest frequency (140) is recorded under low level. It is indicated that a high number of respondents are 'not suffering' from stress. When there are employees with low stress levels, the employee can concentrate on his own development and the organization can also utilize the resource for organizational optimum growth. But 101 respondents are under 'high stress' level. This stress situation cannot be considered good for the person as well as the organization.

3.2.2. STRESS LEVELS – VARIABLES WISE

Overall Stress by Job category

Figure 1 displays that majority of employees have low stress level under executive category compare to other job categories. According to the results obtain from Figure 1, most of the employees which lie under Junior
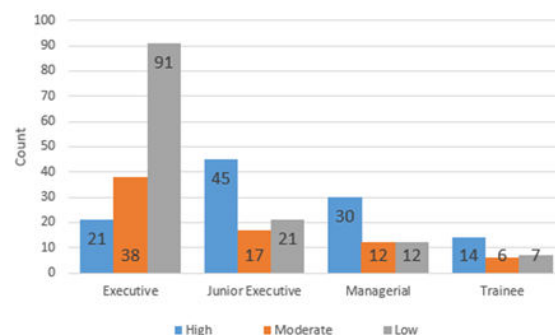
Executive, Managerial and Trainee employees have high stress levels.

Figure 1. Job category wise overall stress

Gender Impact

Table 3: Stress analysis by Gender

Stress Level	Gender		Total	Percentages	
	Female	Male		Female	Male
High	13	88	101	12.87%	87.13%
Low	93	47	140	66.43%	33.57%
Moderate	39	34	73	53.42%	46.58%
Total	145	169	314	46.18%	53.82%

Table 3 summarizes that majority of high stress level respondents were male. But under low stress level category majority of respondents were female.
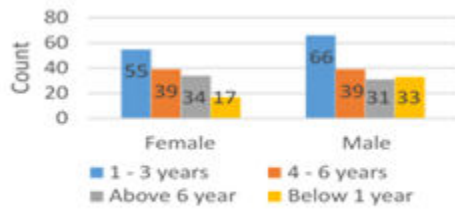

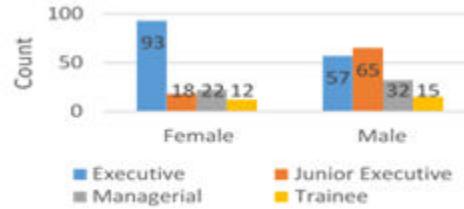*Figure 2. Gender wise Job Experience*

Figure 3. Gender wise Job Category

Findings from the descriptive analysis under gender impact it is reveals that majority of the sample workers were male in high stress level category. Figure 2, indicates that male employees were high in 1-3 years and below 1 year job experience categories. And Figure 3 displays, that Junior Executive and Trainee level male employees were high in number than females. This could explain the reason why a high percentage of male employees fallen in to high stress level category in the company.

Marital status impact

Table 4. Stress analysis by Marital Status

Stress Level	Marital status		Total	Percentages	
	Married	Single		Married	Single
High	65	36	101	64.36%	35.64%
Low	67	73	140	47.86%	52.14%
Moderate	35	38	73	47.95%	52.05%
Total	167	147	314	53.18%	46.82%

Table 4 demonstrates that most of the respondents were married employees under High stress level category. For other categories, percentages seem to be even for both martial statuses.
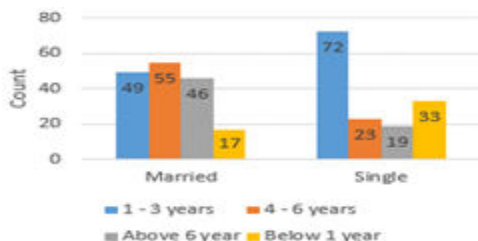

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Figure 4. Matrial status wise Job Experience   *Figure 5. Matrial status wise Job Category*

Findings from the descriptive analysis under marital status impact, it was observed that majority of married respondents are in high stress level category. In Figure 4, more married employees are found in 4-6 years and Above 6 year job experience category than single employees. In Figure 5, data analysis illustrates that the total number of workers in the managerial category for married employees were comparatively larger number than the same of single employees. Based on the results of Figure 1, most of the employees which lie under Junior Executive, Managerial and Trainee employees have high stress levels. Therefore, these comments support why a high number of married employees in the company have fallen into high stress level category.

Age group impact

Table 5: Stress analysis by Age group

Stress Level	Age group				Total	Percentages			
	G1	G2	G3	G4		G1	G2	G3	G4
High	57	38	6	0	101	56.4%	37.6%	5.9%	0.0%
Low	38	62	16	24	140	27.1%	44.3%	11.4%	17.1%
Moderate	16	46	11	0	73	21.9%	63.0%	15.1%	0.0%
Total	111	146	33	24	314	35.4%	46.5%	10.5%	7.6%

G1: Below 25 year, G2: 26 – 35 years, G3: 36 – 45 years, G4: Above 46

According to data set of the Table 5, According to the study majority (94%) of the high stress level employees are coming from (56.4% plus 37.6%) age groups below 25 years and 26-35 years. Under the age category 46 above, only Low stress people were found.

3.3. PEARSON CORRELATION ANALYSIS

Table 6: Correlation matrix of stress variables

	RC	WE	WL	WR	MB	MD	WFI	CD	SS
RC	1.000								
WE	0.014	1.000							
WL	0.032	0.318	1.000						
WR	0.103	0.342	0.252	1.000					
MB	0.140	0.504	0.189	0.628	1.000				
MD	-0.003	0.020	0.361	-0.202	-0.132	1.000			
WI	-0.020	0.273	-0.340	0.165	0.336	-0.399	1.000		
CD	0.205	0.217	-0.066	0.165	0.502	0.142	0.174	1.000	
SS	**0.072**	**0.687**	**0.606**	**0.546**	**0.609**	**0.065**	**0.230**	**0.271**	1.000

Table 6 notes that independent variables against dependent variable correlations were positive, meaning there is a unidirectional relationship between stressor variables and employee stress but the relationship is linear.

3.4. THE CALCULATIONS OF DEGREE OF STRESS LEVEL

Regression analysis is to recognize how a variable of importance (Response Variable) is influenced by changes in another variable (Explanatory Variable). This method was applied in this study in order fulfill one of the key objective in the research.

3.4.1. REGRESSION ANALYSIS

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.6867	0.4716	0.4699	16.19057
2	0.7994	0.6390	0.6367	13.40354
3	0.8506	0.7235	0.7208	11.74998
4	0.8716	0.7598	0.7567	10.96958
5	0.8803	0.7750	0.7713	10.63422
6	0.8858	0.7846	0.7804	10.42025

Under the stepwise regression analysis above results were obtained. It is found that among the eight factors six factors were significant. According to the output given by SPSS, the Independent variables of the model can predict 78.5% of the variance in the Dependent variable. Therefore, model 6 can be identified as an accurate model and it was selected to fit a regression model for stress manifest variables with stress score.

Table 8: ANOVA table results – Model 6

ANOVA					
	Sum of Squares	D.F.	Mean Square	F	Sig.
Regression	121446.108	6	20241.018	186.413	.000
Residual	33334.545	307	108.582		

Table 9: Significance of coefficients – Model 6

Model Number		Unstandardized Coefficients		Stand.Coeffi.	t	Sig.
		B	Std. Error	Beta		
6	(Constant)	-135.923	6.9464		-19.57	0.000
	Work_Env	14.726	1.5436	0.32	9.54	0.000
	Work_Load	14.750	0.9158	0.53	16.11	0.000
	Work_Rel	10.590	2.0024	0.19	5.29	0.000
	Managerial_behavior	4.364	2.0950	0.09	2.08	0.038
	Work_Family_inter	9.214	1.2444	0.24	7.40	0.000
	Career_dev	5.698	1.5349	0.12	3.71	0.000

Dependent variable: Stress Score

The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. Table 8 reveals that the overall model is accepted since the F- value is greater than the rejection criteria value at a 5% level of significance. Table 9 shows that

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all the independent variables statistically and significantly predict the dependent variable as the all t ratio values are significant. Therefore, null hypotheses are rejected at a 5% level of significance. Based on this results Stressor and Stress variable relationship can be interpreted as follows.

Stress Score = -135.92+14.73WE+14.75WL+10.59WR+4.36MB+9.21WFI +5.69CD

3.4.2. RESIDUAL ANALYSIS
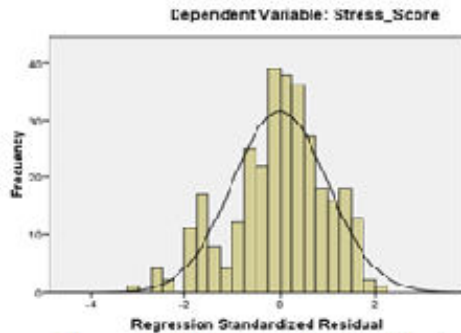
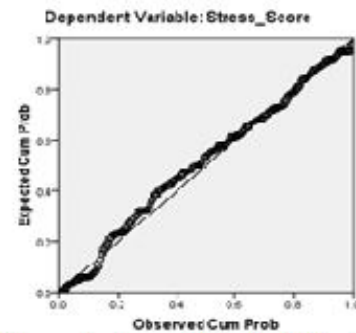Figure 6. Histogram for Residuals   Figure 7. Normal Probability plot

After fitting a regression model performing a residual analysis is important in order to validate the fitted model. One of the main assumptions when fitting a regression line is residuals are normally distributed. According to the graphical representation of residuals in figure 6 (Histogram) shows that the residuals are normally distributed with low value of standard deviation such as 0.99. And also according to the normal probability plot of residuals are approximately lie on the line in figure 7. Based on that result a conclusion can be made such as residual values of the fitted model are lie in a normal distribution.

3.5. STRESS MAP
By considering the multiple regression analysis fitted model equation and using the stress categorization in Table 1, following mathematical optimization model was designed.

Objective function:
Stress Score = -135.92+14.73WE+14.75WL+10.59WR+4.36MB+9.21WFI +5.69CD

Constraints:
WE ≤ 5, WL ≤ 5, WR ≤ 5, CD ≤ 5, WFI ≤ 5
WE, WL, WR, MB, CD, and WFI are non-negative variables.

Optimum values of the objective function were obtained by considering the three main stress level upper bound values which are 39, 69 and 100 for Low stress, Moderate stress and High stress sequentially. By solving the above mentioned optimization

problem using Microsoft excel solver package a stress map was drawn by taking the optimum values of stressors and natural logarithm values of stress score.
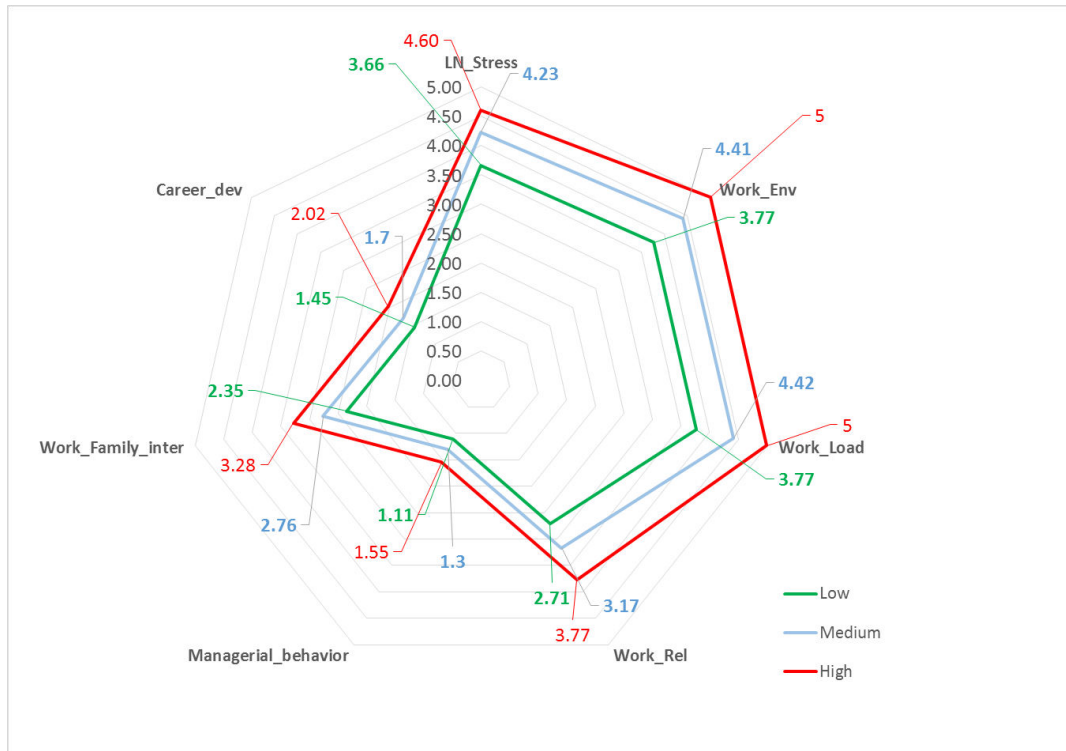

Figure 8. Stress Map

4. CONCLUSION

According to the results the majority of the IT professionals (44.6%) are in low stress level in the concerned company. But 32.2% of employees were under high stress level category, out of that 94% of workers are coming from the age groups below 25 years and 26 to 35 years. Therefore, essential strides are to be taken to supplant employees as workers at development age in this way it may diminish the stress of employees in this company. By considering stress factors, it is found that among the eight factors six factors were significant under the stepwise regression analysis. The two factors, role conflict and mental demand were not significant stress factors in the study. According to standard coefficients of the beta **work environment, work load** and **work family interaction** are the main 3 factors which cause to the current level of stress.

After identifying the stress factors the mathematical equation was found to measure the stress level of a particular employee with an accuracy of 78.5% predictive power. In order to keep the employees in low or moderate stress level it is very important to

identify the exceeding limits of all stress factors. Stress Map developed in this study can be used as stress indicating tool to get an idea about an employee and where they stands with respect to considered stress factors in the selected company.

5. REFERENCES

Prabhu, S. (2015), Study of prevalence of work related stress and co-morbidities and its effect on work performance, *International Journal of Research in Medical Sciences*, 3(11), pp 3161-3162

Fernando, W.R.P.K. (2010), Exhaustion and Stress: An Empirical Study among Workers in Apparel Industry of Sri Lanka, *International Conference on Business and Information*, University of Kelaniya, Sri Lanka

Jayasuriya, R.M. (2012), Organizational Stress among Sri Lankan IT Professionals, National Council of Teachers of Mathematics, 1, pp 111-114

Satheesh Kumar, K. & Madhu, G. (2012), Analysis of factors responsible for of work stress in chemical industries, 2(1), pp 78-80

Alexopoulos, E. C. (2011), Perceived Stress Scale: Reliability and Validity Study, *International Journal, Environ Res Public Health*, pp 3287–3298

(1998). The American Institute of Stress survey questionnaire: Workplace Stress Survey. Retrieved June 1, 2017 from: https://www.stress.org/self-assessment/