### **Original Research Article**

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# Work-related stress assessment among a garment factory employees in Bangalore suburban locality

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#### **ABSTRACT**

**Background:** India's Garment Industry has been rapidly growing in last few years. The Garment Industry is of major importance to the Indian economy as it contributes substantially to India's export earnings. Thus employees working in the above sociological context of working life are expected to be affected by the general acceleration of the pace of life, contributing to work intensification and constant time pressure. Managers play a key role in reducing the significant sources of stress and shaping the future of employees. Thus the above study was undertaken among managers and supervisory level staff. The objectives of the study were to estimate the magnitude and level of work-related stress and to find the association of socio-demographic factors with work-related stress in garment manufacturing factory.

**Methods:** A cross-sectional study was undertaken for 4 months, from October 2015 to January 2016, in a selected garment factory, located in the periphery of Bangalore city. A total of 167 supervisors and 41 managers, were included in the study. Stress was assessed by using 'Tool to assess and classify work stress and associated symptoms', developed by Centre for public health, NIMHANS.

**Results:** Prevalence of work-related stress was 26% (95% CI; 18.04-26.36). Managers had higher prevalence of stress (29.3%) when compared to supervisors (25.1%). Majority of managers were perceived to have moderate stress level (58.4%) when compared to supervisors (26.10%). Among all the socio-demographic factors; age, total monthly income, travel time and mode of transport were significantly associated with work-related stress (p<0.05).

**Conclusions:** Organization changes viz., effort-reward imbalances, needs to be corrected and appropriate transport facilities meeting the employee requirements have to be provided, to cope up stress associated with travelling.

Keywords: Stress, Work-related stress, Manager, Supervisor, Employee, Industry

#### INTRODUCTION

Indian sub-continent is the second largest manufacturer of garments after China. Today India is booming with fashion and lifestyle, with the organized retail trade growing at a rate of 30% per annum. India's Garment Industry has been rapidly growing in last few years. The

Garment Industry is of major importance to the Indian economy as it contributes substantially to India's export earnings. Today's changing consumer preferences buying branded apparel and fashion accessories, major boom in retail industry, and discount stores, shopping malls etc., along with government policy focused on fast-track textile export growth, and ambitious goals have led

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to increase in orders from global buyers accompanied by a rise of investments in the garment sector of the country creating several investment opportunities in India. Thus employees working in the above sociological context of working life are expected to be affected by the general acceleration of the pace of life, contributing to work intensification, constant time pressure, multitasking and the need to learn new things just to maintain the status quo.<sup>2</sup> In addition to these structural and long-term changes, the uncertain economic crisis places increasing pressure on both employers and workers to remain competitive. Many of these changes opportunities for development; nevertheless, when poorly managed, they pose increasing risks for psychosocial disorders and result in negative health and safety outcomes.3,4

There is often confusion between challenge and stress in the workplace. While challenge at work can have positive effects on people, whereas work-related stress is an occupational health and safety hazard that can pose risks to health. World Health Organization's (WHO) has defined work-related stress as 'the reaction people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.<sup>5</sup> Work-related psychosocial risks and stress, together with their associated negative health and business outcomes affect a remarkable number of workplaces (EU-OSHA). Significant changes have affected workplaces over the last several decades and resulted in new occupational safety and health (OSH) challenges, which include global developments such as increasing socio-political globalization, urbanization and the establishment of a free market, advances in information and communication technology, new types of contractual and working time arrangements as well as significant demographic changes.6

The research literature has consistently revealed that; workplace characteristics affect the level of stress and number of health problems experienced by workers. Some of them include, mental health problems such as post-traumatic stress disorder, depression, and/or anxiety, Physical health problems, such as musculoskeletal disorders, and increased risk of physical diseases or illness, e.g. cardiovascular disease (precursors to physical ill health outcomes may include muscular tension and increased blood pressure); and social relationships which can contribute to a breakdown of relationships both at work and home.<sup>6</sup> Thus stress at work compromises workers performance (precursors to poor work may include difficulty concentrating and memory loss), contributing to work injuries and illnesses, subsequently impact the organization with decreased productivity.<sup>7</sup>

The WHO advises that 'stress occurs in a wide range of work circumstances but is often made worse when employees feel they have little support from supervisors and colleagues and where they have little control over work or how they can cope with its demands and pressures.' Some of the potential sources elicited are, workplace environment, which includes both social environment (organisational culture and function, interpersonal relationships, etc.), physical environment (e.g. equipment's used), work-systems (E.g., work-load or work pace, work schedule or working hours).<sup>5,8</sup> Reddy and Ramamurthy concluded that stress was found to be considerably influenced by age-related factors among 200 male executives. 9 Sharma reported a finding from a study by the Defence Institute of Psychological Research (DIPR) which revealed that increase in the occupational factors such as years of job experience and job hierarchy increased the levels of stress among officers, junior commissioned officers (JCO) and jawans.<sup>2,10</sup> While physical work-related hazards (e.g. respiratory diseases in relation to occupational exposures) have been explored in a large number of earlier studies in occupational settings (Ahasan et al, Khanam et al), psychologically adverse working conditions and their potential health effects have been addressed insufficiently.<sup>11</sup> Demographic variables that are proven to relate to someone's job stressor/health relationships include gender, age, marital status, job tenure, job title, and hierarchical level (Dua); Lind and Otte, Murphy), among which gender, age and hierarchical level were found to be the most significant, as further explanations reveal. But, Studies exploring the association of socio-demographic variables with workstress among garment manufacturing sectors are scarce in Indian context. 12

Managers pay a key role in reducing the significant sources of stress (Blake et al), as this leads to a higher employee satisfaction, increases the productivity of the workforce and reduces negative consequences of stress, which at the end, results in higher profits. Work-related stress should become an issue which increasingly features on the agenda of efficient managers (McHugh). 13 Managers and supervisors play a vital role in shaping the future of employees as they are the support pillars who can make or break any situation for them. It should be in their best interest to keep stress levels in the workplace to a minimum level. There are some organizational changes that managers and supervisors can undertake to reduce stress at workplace related to the job in hand as that's the point of ignition for stress.<sup>14</sup> Thus the above study was undertaken among managers and supervisory staff to estimate the magnitude and level of work-related stress and to find the association of socio-demographic factors with work-related stress in garment manufacturing setting.

#### **METHODS**

A cross-sectional study was undertaken for 4 months, from Oct 2015 to Jan 2016, in a selected garment factory, located in the periphery of Bangalore city (~30 km), the capital of Karnataka. Three criteria were employed to select the factory: 1) Relatively fast traffic-related accessibility 2) A size of the work force between 200 and

250 employees, which was considered both statistically sufficient and logistically feasible and, 3) The factory owner's willing to cooperate (e.g., granting unrestricted access on pre-specified dates).

The chosen factory employed a total of 1200 men and women working as helpers, machine operators, cutters, folders, iron men/women, packing men/women, supervisors, quality inspectors, technical staff, finance personnel, and managers. Range of sections represented the common structure in any garment factories in India. Each individual in first-line of management who monitors and regulates baseline employees in their performance of delegated tasks (supervisor) and a person responsible for controlling or administering a group of supervisors working in the factory (including the management i.e., managers) were considered eligible for the study. Thus a total of 167 supervisors and 41 managers, with minimum 6 months of experience in current employment were approached for participation. No exclusion criteria were applied based on the assumption at the outset of the study that all potential participants would be adults. After obtaining clearance from Intuitional Ethics Committee, a written informed consent was obtained from all participants. Each subject was contacted in person and detailed standardized explanations with information on, amongst others, the involved parties, background of the study, survey procedures, and anonymity of participants were slowly read out before administering the tool. Data was collected using a self-administered questionnaire during their leisure time at work (before and after breaks). The approximate time taken to interview each subject was 20 minutes. Employee participation was voluntary upon signature of a formal consent.

#### Research instrument

Stress was assessed by using 'Tool to assess and classify work stress and associated symptoms', developed by Centre for public health, NIMHANS. Initial part of tool contained questions pertaining to socio-demographic profile; Job designation, work-section, age, sex, marital status, education, travel time to industry, mode of transport, and total monthly income, followed by stress assessment questions categorized as 5 domains of: career development, role in organization, organizational environment, organizational support and work-life balance. Career development was measured by two items that captured perceptions of; salary, recognition, promotion prospects of effort-reward imbalance and job security. Organizational role included role overload and role ambiguity. Questions pertaining to working conditions, time-pressure, and relationships with peers and superiors formed the part of organizational environment. Perceived adequacy of appraisal, feedback and training were measured by organizational support. Work-life balance contained subset of questions measuring difficulties in balancing work and personallife. Responses to the questions were based on workplace

experiences within in past six months. Scoring ranged from a minimum affirmative score of 0 to a maximum score of 98 and employees who scored 48 or more were considered to be stressed. Responses on all items were scored in a two-stage process: First as a dichotomous variable of agreement and in a second step as the extent of dis-/agreement (a little/very much). If combined, both steps yielded a 4-point Likert-scale (1½ disagree very much, 2½ disagree a little, 3½ agree a little, 4½ agree very much). <sup>15</sup>

#### Statistical analyses

A descriptive analysis was performed by using means, standard deviations, minimum and maximum values of the scores attributed to continuous variables and ratios referring to categorical variables. Associations between participant characteristics and work-related stress were assessed using both univariate and multivariable logistic regression models. Unadjusted analysis was undertaken by using chi-square test to test the association between stress at work and other categorical variables. Later, a multiple logistic regression analysis was applied, adjusting for confounding variables. A 5% level of significance was used for all performed analyses.

#### **RESULTS**

## Descriptive statistics: Characteristics of the studied population

The categorical variables of socio-demographic, occupational and lifestyles features are shown in Table 1. Most participants were male (83.7%), married or living with a partner (70.7%), and majority had had education higher than schooling (62%). Majority of subjects were in the age group of 26 to 30 years with mean age 29 (IQR; 26-32) yr. Highest proportion of subjects were deployed in production section (21.2%) followed by quality check and cutting sections. Supervisors (80.3%) outnumbered managers (15.4%) across all sections. The workers performed activities only during day shifts. Majority of participants had income less than 20000 per month (46.6%). Most of them spent less than 30 minutes (46.2) to travel from residence to factory. Majority of them utilized company provided vehicle as mode of transportation from their place of residence to factory (84.6).

#### Stress at work

Prevalence of work-related stress was 26% (95% CI; 18.04-26.36) as given in Table 2. Managers had higher prevalence of stress (29.3%) when compared to supervisors (25.1%). However, the difference in prevalence of stress between two categories was not found to be statistically significant (p=0.59). Further, among stressed; majority of managers perceived to have moderate stress level (58.4%) when compared to supervisors (26.10%) whereas majority of supervisors

were found to have mild stress level (73.8%) as shown in Figure 1. None of participants were found to have severe stress level.

Table 1: Distribution of study subjects based on Sociodemographic factors.

Job designation	No. (%)				
Managers	41 (19.7)				
Supervisors	167 (80.3)				
Name of section					
Production	44 (21.2)				
Cutting	30 (14.4)				
Sewing	10 (4.8)				
Finishing	09 (4.3)				
Maintenance	25 (12.0)				
Supply chain	12 (5.8)				
Human resource	10 (4.8)				
Training	18 (8.7)				
Quality check	35 (16.8)				
Others	15 (7.2)				
Age group (in yrs.)					
≤25	47 (22.6)				
26-30	103 (49.5)				
≥31	58 (27.9)				
Gender					
Male	174 (83.7)				
Female	34 (16.3)				
<b>Education level</b>					
Schooling	79 (38)				
Intermediate	e 99 (47.6)				
Graduate	19 (9.1)				
Professional	11 (5.3)				
Income group (Rs)					
≤20000	97 (46.6)				
21000-30000	68 (32.7)				
≥31000	43 (20.7)				
Travel time (in min)					
≤30	96 (46.2)				
31-60	39 (18.8)				
≥61	73 (35.1)				
Mode of transport					
Factory vehicle	176 (84.6)				
Other means	32 (15.4)				

Table 2: Prevalence of work-related stress according to job-designation.

Stress	Job design	Job designation		
	Manager No. (%)	Supervisor No. (%)	Total No. (%)	
Present	12(29.3)	42(25.1)	54(26.0)	
Absent	29(70.7)	125(74.9)	154(74.0)	
Total	41(100)	167(100)	208(100)	

 $\chi^2=0.291$ , p=0.59.

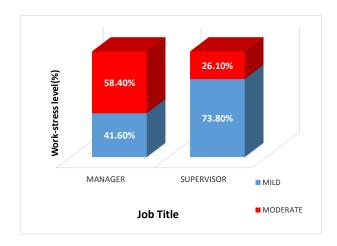


Figure 1: Levels of work-related stress according to job-designation.

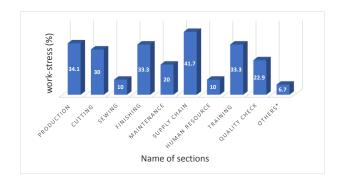


Figure 2: Section wise distribution of work-related stress.

Subjects working in supply chain had highest prevalence of work-stress when compared to all other sections; followed by production, training and maintenance sections. Whereas rest all other sections were found to have comparatively lesser prevalence of work-stress as shown in Figure 2.

Chi-square test was applied to find the association between socio-demographic factors and work-related stress. Among all the socio-demographic factors; age, total monthly income, travel time and mode of transport were significantly associated with work-related stress (p<0.05). Further, on multiple logistic regression, it was observed that subjects in the age group of 26 to 30 years were 4.64 times more likelihood of developing stress when compared to subjects aged less than 25 years. Subjects with monthly income were less than 20000 were 4.25 times more likely to be stressed than those whose income exceeded 30000 per month. The association between monthly income and work-relate stress was statistically significant. However after adjusting for other confounders the association was found to be nonsignificant. On univariate analysis, it was observed that subjects requiring a travel time of more than 60 minutes were 2.71 times at higher risk of work-related stress than those who spent less than 30 min in travelling. On further

analysis after adjusting for various confounders workstress level among those whose required travel time greater than 60 min and between 30 to 60 minutes were 4.32 and 2.57 times more likely to be stressed than those requiring less than 30 minutes respectively. The difference in prevalence of stress between the two categories was statistically significant (p<0.001). Subjects who resorted to other modes of transport viz.,

bringing their own vehicle or public transports were 3.08 times (on univariate analysis) and 5.18 times (on multivariate analysis) more likely to be stressed than who chose company provided vehicle as their mode of transport. The difference in prevalence of stress between two categories, was statistically significant (p<0.01) as shown in Table 3.

Table 3: Univariate and Multiple logistic regression analysis of work-related stress and associated factors.

Variable name		Work-stress		Univariate		Multiple logistic regression	
	Level	Present No. (%)	Absent No. (%)	OR (95% CI)	P value	OR (95% CI)	P value
Age	≥31	24 (41.4)	34 (58.6)	2.04 (0.8-4.8)	0.04	3.76 (1.4-10.04)	0.08
	26-30	18 (17.5)	85 (82.5)	0.61 (0.2-1.4)	< 0.01	4.64 (1.9-10.9)	< 0.01
	≤25	12 (25.5)	35 (74.5)	1	-	1	-
Gender	Male	48 (27.6)	126 (72.4)	1.77 (0.7-4.9)	0.22	-	-
	Female	6 (17.6)	28 (82.4)	1		-	-
Marital status	Unmarried	16 (26.2)	45 (73.8)	1.02 (0.5-2.0)	0.95	-	-
	Married	38 (25.9)	109 (74.1)	1		-	-
Total family Income (in Rs)	≤20000	35 (36.1)	62 (63.9)	4.25 (1.6-13.1)	< 0.01	0.13 (0.04-0.41)	0.01
	21000-30000	14 (20.6)	54 (79.4)	1.95 (0.6-6.5)	0.22	0.32 (0.09-1.09)	0.06
	≥31000	5 (11.6)	38 (88.4)	1		1	
Educational status	Higher education	32 (24.8)	97 (75.2)	0.85 (0.4-1.6)	0.62	-	-
	Schooling	22 (27.8)	57 (72.2)	1		-	-
Travel time (in min)	≥61	27 (37)	46 (63)	2.71 (1.3-5.5)	< 0.01	4.32 (1.8-10.1)	0.01
	31-60	10 (25.6)	29 (74.4)	1.59 (0.6-3.8)	0.29	2.57 (0.9-6.7)	0.05
	≤30	17 (17.7)	79 (82.3)	1		1	-
Mode of transport	Other means*	15 (46.9)	17 (53.1)	3.08 (1.3-6.7)	< 0.01	5.18 (2.0-12.9)	< 0.01
	Factory vehicle	39 (22.2)	137 (77.8)	1		1	-

Other means\*: own vehicle, public transport, walking.

#### **DISCUSSION**

Prevalence of work-related stress in the current study was 22.2% and managers had higher stress level (i.e. 29.3%) when compared to supervisors (i.e. 25.1%). In a similar study, carried out by Sein et al, using Job Content Questionnaire, in April 2009, on 200 rubber glove factory employees in central Thailand revealed; prevalence of job stress was 27.5% and Low supervisor social support and high job insecurity were found to be associated factors. 8,16

The experience of occupational stress due to pressure from overload, personal responsibilities and managerial role, may be due to their position in the industry and have to work up to the expectation of their seniors. It was well expected by managers and supervisors as they are to show their ability to reach higher position in the organization and consequently experience more work stress.<sup>17</sup>

A similar findings a cross sectional study by Prakash et al at Central Hospital, South East Central Railway (SECR),

Bilaspur. Moderate stress was high among employees i.e. 57%, followed by mild stress 42%, where as severe stress was experienced by only 1%, when compared to control group. Among associated factors top 5 stressors were identified to be postural discomfort (96%), noisy work place (95%), long duties with improper rest (88%), fear of susceptibility to accidents due to drowsiness caused by fatigue and exhaustion (83%), absence of toilet in job requiring long hours of working and responsibilities of thousands of life. 18 In 2003 a study by Choy et al, among 34 multinational companies operating in Malaysia revealed, managers had higher prevalence of stress due to heavy workloads, higher stress levels among managers may be attributed to high job demands in the form of set forth targets and responsibility of large number of employees under their span of control, when compared to other cadre of employees. 19 In our study, subjects with monthly income less than 20000 perceived higher stress levels, than those whose income exceeded 30000 per month, similarly in a study by Maria Carmen Martinez et al on electric utility workers, it was also observed that income and regular physical activity were inversely related to stress.20

Davidson et al found that female managers are under much more pressure than their male counterparts, and Antoniou et al found that female teachers experienced significantly higher levels of occupational stress compared to their male counterparts.<sup>22</sup> In our study female employees experienced lesser level of stress than males, may be as they were engaged in less demanding tasks at work than men and they often had lesser non-work demands.

Concerning the relationship between age and occupational stress, the ability to handle stress associated with job and organization was found to increase with age. Dua et al, in their research revealed that younger staff members reported more job stress than older staff Similarly Ben-Bakr et al found that employees who are less than 30 years old experienced higher levels of stress and that staff between the ages 31 and 40 suffered the most from job stress.<sup>23</sup> But contrasting to above studies, in our study, stress was less among younger employees than their counterpart's reason could be; the flexibility to change and adopt to the organizational climate or ability to learn new techniques and adopt skills faster than their counterparts in transitioning economy.

In the present study, the stress was high among subjects who opted other modes of transport, than those who utilised company provided vehicle, as their mode of transport. Findings could be because of convenient timings, lesser probability to face traffic and propensity to meet accidents. A study by Richard in 2011 found, data for both the work and leisure studies showed; that for car users, alternative transport modes are inferior on the salient attributes such as convenience and flexibility even though car users rate modes such as walking and cycling as performing well, if not better, on less important attributes such as the environment, health and even excitement.<sup>24</sup>

Current study observed subjects requiring a travel time of more than 60 minutes were at higher risk of developing stress than those who spent less than 30 min in travelling. In another study by Eric Hansson observed, monotonous relations were found between duration of public transport commuting and the health outcomes. For the category commuting >60 min odds ratios (ORs) ranged from 1.2-1.6 for the different outcomes. For car commuting, the relationships were concave downward or flat, with increasing subjective health complaints up to 30-60 min (ORs ranging from 1.2-1.4), and lower ORs in the >60 min category.<sup>25</sup> A number of limitations of our study need to be noted. We drew on cross-sectional data, which does not allow inferences of causality from observed associations. Although we were able to adjust for important confounders in our statistical analyses, residual or unmeasured confounding can never be ruled out. It is important to note, though, that the generalizability of our findings to other industrial settings or other employment sectors in India may be limited.

#### **CONCLUSION**

Prevalence of work-related stress was 26% (95% CI; 18.04-26.36). The prevalence of stress was high among managers when compared to supervisors. Further, the prevalence of moderate stress was high among managers when compared to supervisors. Thus the attitudes, feelings and emotions of employees towards organization play a vital role in determining their performance and behaviour. Therefore the organizations need to pay increasing attention on understanding Organizational Climate, enhancing the Job Satisfaction of their employees and thus reducing the Stress at work-place. On multiple logistic regression after adjusting other variables, it was found that; work-related stress was significantly associated with age, total monthly income of family, travel time and mode of transport. When there is no balance between the effort undertaken and the reward received, negative feelings may be triggered as a response to stress. Also, low income often associated with other negative factors like increased job insecurity, irregular working hours, occupational hazards and low work control, that can enhance their mutual negative effects, increasing stress at work and its harmful consequences. Thus high income level, career opportunities and appreciation are the rewards expected.

#### Recommendations

Stress management programmes, both individual focused and organizational focused may be conducted. The individual focused strategies like relaxation techniques, biofeedback, meditation, exercise can be undertaken. The organizational focused strategies like adapting organization structure, selection and placement, training, altering physical and environmental job characteristics, job rotation and emphasizing health concerns can done to minimize stress.

Effort-reward imbalances are to be corrected and travelling related difficulties need to be resolved, in order for employee to reach factory on time and safely.

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