

## Original Research Article

# Study of occupational stress among the workers of micro, small and medium enterprises, Bengaluru

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## ABSTRACT

**Background:** Occupational stress can cause mental and physical illnesses, resulting in high costs for the individual, the economy and society. Due to globalisation and changes in the nature of work, people in developing countries have to deal with increasing occupational stress. In a developing country like India, the contribution of MSMEs is highly inevitable. This study aimed to study of occupational stress among the workers of micro, small, and medium enterprises.

**Methods:** The present study was conducted among 350 workers of different MSMEs of Kottegepalya, a periphery of Bengaluru city. Those enterprises were selected whose owners had granted permission and were willing to co-operate. The data was collected through a face-to-face interview based cross-sectional survey, using a structured questionnaire which consists of socio-demographic data, occupational stress responses for assessment of occupational stress, and factors responsible for occupational stress. Chi Square, Fisher's exact test, adjusted Odds ratio and logistic regression were used for statistical analysis.

**Results:** The overall prevalence of occupational stress was 78.57%, out of those 46% workers had mild occupational stress. Majority of the workers 28.57% had an emotional response. Occupational stress was higher 95.23% in age group of 50 years; males had higher prevalence of 80.23%. Among all the socio-demographic factors; age and marital status and education were significantly associated with occupational stress ( $p < 0.05$ ).

**Conclusions:** The present study showed an increasing trend of occupational stress among workers. There is a need for interventions aimed at mitigating the occupational stress among MSMEs workers.

**Keywords:** Micro, small, and medium enterprises, Occupational stress, Workers

## INTRODUCTION

Occupational stress is the term used for ongoing stress that is related to the workplace.<sup>1</sup> Around 500 million people worldwide suffer from mental illness. Around 10% to 12% of Indians have a mental illness, which can be brought on by stress, depression, anxiety, or other factors.<sup>2</sup> As a result of globalisation and changes in the

nature of work, people in developing countries are experiencing an increase in occupational stress.<sup>3</sup> Mental health is a state of well-being in which an individual recognises his or her own abilities, is able to cope with normal life stresses, works productively, and contributes to their community.<sup>4</sup> Occupational stress is a collection of emotional, cognitive, behavioural, and physiological reactions to negative and noxious aspects of one's job, organisation, and environment. High levels of arousal and

distress, as well as feelings of helplessness, characterise this state.<sup>5</sup>

There are several working conditions called “stressors” and consist of those things which have a negative effect on a worker’s physical or emotional well-being: job control, lack of control overwork, lack of recognition for work done, job insecurity, fear of layoffs harassment, lack of respect from supervisors, racism, age discrimination, inadequate pay, job demand, poor ventilation, and heating, poor lighting, forced for overtime work, shift work, fear of an accident or even death on the job etc.<sup>1</sup>

The micro, small, and medium enterprises sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. The developing country like India, the contribution of MSME is highly inevitable.<sup>6</sup>

## METHODS

A cross-sectional study was undertaken for one year, from March 2020 to February 2021, of selected Micro, Small and Medium Enterprise (MSME) workers of Kottegepalya, a locality on the periphery of Bengaluru city, Karnataka, India.

The criteria employed to select the enterprises were relatively fast traffic-related accessibility; and nearest to the centre of our study. There were approximately more than 100 enterprises in this area, and an average of 20 workers were working in these enterprises, which was considered both statistically sufficient and logistically feasible; and, the enterprise owners' willingness to cooperate (e.g., granting unrestricted access on pre-specified dates). A total of 30 enterprises were studied. Of those, 21 enterprises were manufacturing and 9 were service enterprises. A total of 417 men and women working as helpers, machine operators, cutters, welders, fitters, packers, supervisors, designers, technical staff, clerks, and managers. All workers between 20-50 years of both genders who had given consent were included for participation in the study, except pregnant and lactating women.

The sample size was calculated considering the prevalence of stress (p) to be 26% and relative precision (d) of 5% with a 95% confidence interval using the formula:

$$Z^2 P (1-p)/d^2.$$

The calculated sample size was 295, which was corrected and increased to 350. Ethical clearance was given by the institutional ethical committee. A written informed consent was obtained from the workers. The data was collected through a face-to-face interview of workers during their leisure time at work (before and after breaks), using a structured questionnaire which consists of socio-demographic data, occupational stress responses, and

factors (stressors) responsible for occupational stress. The approximate time taken to interview each worker was 15 minutes. Workers' socio-demographic data was collected using a modified Kuppaswamy scale.<sup>7</sup> The Questionnaire/Schedule was based on the World Health Organization's health series No.6 for protecting workers and raising awareness of stress at work, as well as stress and coping strategies advised by the National Institute of Mental Health and Neuro Science.<sup>3,8</sup> The questionnaire was validated by the experts of preventive and social medicine of the institute. Occupational stress was assessed by using occupational stress responses, which had 25 close-ended questions categorised as 4 domains: behavioural response, cognitive response, emotional response, and physiological response. Each was answered with a ‘Yes’ or ‘No’. Each observation of a question, if answered 'Yes', was also as 'One' and 'Zero' for 'No'. If the score was 0-10%, it was considered as no occupational stress, 11-33% was considered as mild, 34-66% moderate, and 67-100% was considered as severe occupational stress. Workers were also asked to address factors responsible for occupational stress in the form of a questionnaire having closed-ended questions to be answered as 'Yes' or 'No'. Each question had to be scored as zero or one, every question either in affirmation (Yes) or rejection (No). If it has to be scored as one, it is also to be highlighted as bold.

The means, standard deviation, minimum, and maximum values of the scores attributed to continuous variables, as well as ratios referring to categorical variables, were used in a descriptive analysis. Chi-Square and Fishers exact test were used to examine the relationships between participant characteristics and occupational stress. The Odds ratio was used to test the relationship between occupational stress and other categorical variables in an adjusted analysis. After that, confounding variables were adjusted using a multiple logistic regression analysis. For all of the analyses, a 5% level of significance was used.

## RESULTS

The prevalence of occupational stress was 78.57% and the maximum number of workers, 161 (46%), had experienced a mild level of occupational stress. In the present study, the maximum number of workers (28.57%) experienced an emotional type of stress response, followed by 66 (18.86%) workers who had experienced more than one response to occupational stress, as shown in Table 1.

The categorical variables of socio-demographic, occupational, and lifestyle features are shown in Table (2). Most participants were males (75.1%), married (65.4%), Hindu (86.2%) and the majority had primary to high school educations (51.1%). The majority of subjects were in the age group of 20 to 29 years (39.4%), with a mean age of 34.5 years. The highest proportions of subjects were deployed in manufacturing enterprises (73.4%), followed by servicing enterprises (26.6%). The

majority of participants had an income of 10002-29972 rupees per month (56.6%). The factor which causes occupational stress among the workers was participation and control (29.7%), followed by income (28%), and more than one factor (20.2%). The Chi-square test was applied to find the association between socio-demographic factors and occupational stress. Among all the socio-demographic factors, age, marital status, and education were significantly associated with occupational stress ( $p < 0.05$ ). The Chi-square and fissure-exact tests are applied to find the association between factors which cause occupational stress and occupational stress. Among all the factors, only participation and control, and more than one factor were significantly ( $p < 0.05$ ) associated with occupational stress.

Further, on multiple logistic regressions, it was observed that the odds of occupational stress was 3.98 times higher in the age group of 40-49 years as compared to 30-39 years. Similarly, the odds of occupational stress was found to be 12.79, higher in the age group of 50 years as compared to the younger age group. Among all the sociodemographic factors, we found that age was the

most important predictor of occupational stress as show in Table 3.

**Table 1: Prevalence of occupational stress and its responses among workers.**

Variables name	Category	No. of workers (%)
		(n=350)
<b>Occupational stress</b>	Yes	275 (78.57)
	No	75 (21.43)
<b>Occupational stress</b>	Mild	161 (46)
	Moderate	99 (28.3)
	Severe	15 (4.3)
<b>Occupational stress response</b>	Behavioral	21 (6)
	Cognitive	74 (21.14)
	Emotional	100 (28.57)
	Physiological	73 (20.86)
	More than one	66 (18.86)
	Without any dimension	16 (4.57)

**Table 2: Distribution of workers based on sociodemographic factor and stressors and their association with occupational stress.**

Variables name	Category	Occupational stress, N (%)		Total, N (%)	P value
		Yes, 275 (78.57%)	No, 75 (21.43%)		
<b>Gender</b>	Male	211 (80.23)	52 (19.77)	263 (100)	0.189
	Female	64 (73.56)	23 (26.44)	87 (100)	
<b>Age (years)</b>	20-29	94 (68.12)	44 (31.88)	138 (100)	<0.0001
	30-39	62 (76.54)	19 (23.46)	81 (100)	
	40-49	79 (88.76)	10 (11.23)	89 (100)	
	50	40 (95.23)	2 (4.76)	42 (100)	
<b>Religion</b>	Hindu	242 (80.13)	60 (19.87)	302 (100)	0.155
	Muslim	26 (66.67)	13 (33.33)	39 (100)	
	Christian	7 (77.78)	2 (22.22)	9 (100)	
<b>Marital status</b>	Married	189 (82.53)	40 (17.47)	229 (100)	0.013
	Unmarried	86 (71.07)	35 (28.93)	121 (100)	
<b>Income</b>	≤10001	101 (80.8)	24 (19.2)	125 (100)	0.42
	10002-29972	151 (76.26)	47 (23.74)	198 (100)	
	>29972	23 (85.18)	4 (14.81)	27 (100)	
<b>Workers of enterprises</b>	Workers of manufacturing	204 (79.38)	53 (20.62)	257 (100)	0.543
	Workers of servicing	71 (76.34)	22 (23.66)	93 (100)	
<b>Education of workers</b>	Illiterate	51 (87.93)	7 (12.06)	58 (100)	0.002
	Primary to high school	144 (80.44)	35 (19.55)	179 (100)	
	Intermediate to postgraduate	80 (70.79)	33 (29.20)	113 (100)	
<b>Causes of occupational stress</b>	Job demands and working condition	32 (88.9)	4 (11.1)	36 (100)	0.111
	Participation and control	67 (64.42)	37 (35.58)	104 (100)	<0.0001
	Interpersonal relation ship	2 (100)	0	2 (100)	1
	Career development and job security	4 (80)	1 (20)	5 (100)	0.93
	working hours	20 (80)	5 (20)	25 (100)	0.85
	Role in the company and information	1 (50)	1 (50)	2 (100)	0.9
	Income	76 (77.56)	22 (22.44)	98 (100)	0.77
	Work home interface	5 (71.42)	2 (28.57)	7 (100)	0.64
	More than one	68 (95.77)	3 (4.23)	71 (100)	0.0001

**Table 3: Univariate and multiple logistic regression analysis of occupational stress and associated factors.**

Variables name	Category	Occupational stress		Univariate	P value	Multiple logistic regression	P value
		Yes (%)	No (%)	OR (95%CI)		OR (95%CI)	
<b>Age (in yrs)</b>	20-29	94 (68.12)	44 (31.88)	0.65 (0.35-1.22)	0.001	1.44 (0.71-2.94)	0.31
	30-39	62 (76.54)	19 (23.46)	0.27 (0.12-0.57)			
	40-49	79 (88.76)	10 (11.23)	0.10 (0.02-0.46)			
	50	40 (95.23)	2 (4.76)	12.79 (1.57-104.03)			
<b>Marital status</b>	Married	189 (82.53)	40 (17.47)	1.92 (1.14-3.23)	0.013	0.57 (0.23-1.42)	0.23
	Unmarried	86 (71.07)	35 (28.93)				
<b>Education</b>	Illiterate	51 (87.93)	7 (12.06)	1.77 (0.74-4.27)	0.002	0.51 (0.18-1.45)	0.2
	Primary to SSLC	144 (80.44)	35 (19.55)				
	PUC to Postgraduate	80 (70.79)	33 (29.20)				

## DISCUSSION

In the present study, the prevalence of occupational stress among the workers was 78.57%, which was higher than in other studies and could be because of differences in study setting and the use of different tools. A study done on industrial workers in Bengaluru in 2015 and 2017 shows the prevalence of stress at 18% and 26%, respectively.<sup>2,9</sup> It shows that stress levels are increasing year by year. According to the most recent survey (2020) of 1,908 Indian workers, 70% of them reported experiencing stress at least once during the working week on a regular basis.<sup>10</sup>

The present study was the first of its kind to report occupational stress on the basis of stress responses such as behavioural, cognitive, emotional, and physiological, and the majority of the workers (28.57%) experienced an emotional type of response.

In the present study, the male-to-female ratio was 75.1% and 24.9%. According to the annual report (2019-20) of the ministry of MSMEs, male and female worker distribution all over India in urban areas was 81.58% and 18.42% respectively.<sup>11</sup> In the present study, male and female workers had 80.23% and 24.9% of occupational stress, respectively. A study conducted by Davidson et al revealed that female managers possess more pressure than their male counterparts, while Antoniou et al. found that female teachers experience significantly higher levels of occupational stress compared to their male counterparts.<sup>12,13</sup> Our result was supported by a study done by Rajram et al which showed female workers experienced a lower level of stress than males.<sup>9</sup> In ancient Unani literature, it is clearly mentioned that melencholia (a psychological disorder) is more common in men than in women, less common in adults, and uncommon in children. Middle aged and elderly people are more prone to melencholia.<sup>14-16</sup> Concerning the relationship between age and occupational stress, the ability to handle stress associated with work and organisation was found to

increase with age. Ben-Bakr et al found that workers who are less than 30 years old experienced higher levels of stress and that workers between the ages of 31 and 40 suffered the most from job stress.<sup>17</sup>

However, in contrast to the previous studies, stress was lower among younger workers than among their counterparts in the current study, which could be due to their flexibility to change and adapt to the organisational climate or their ability to learn new techniques and adopt skills faster than their counterparts in a transitioning economy. In the present study, the older age group of 50-year-olds had a maximum level of stress of 95.23% ( $p < 0.05$ ) as shown in Table 2, which coincides with the study done by Rajaram et al.<sup>9</sup>

In the present study, 65.4% of workers were married, out of which 82.53% had occupational stress, and out of 121 unmarried workers, 71.07% had occupational stress. Our study showed married workers had greater occupational stress than unmarried workers. It may be due to extra family burdens and responsibilities that interfere with their work. In contrast with our study, a study done by Rajaram et al found that unmarried workers had some higher stress, at 26.2%, than married workers, at 25.9%.<sup>9</sup>

The maximum numbers of workers (56.6%) were in the 10002-29972Rs/month income group. The majority of participants had an income of less than 30000 Rs/month (92.7%). According to Rajaram et al (2017), subjects with a monthly income of less than 20000 were 4.25 times more likely to develop stress than those with a monthly income greater than 30000. The association between monthly income and occupational stress was statistically significant. However, after adjusting for other confounders, the association was found to be non-significant. Similarly, in a study done by Maria Carmen Martinez et al on electric utility workers, observed that income and regular physical activity were inversely related to stress.<sup>18</sup> In contrast with previous studies, the present study showed the higher income group had higher

occupational stress. The group of workers who had >29972 Rs/month income experienced 85.18% occupational stress, although they were less in number.

The stressors identified for the occupational stress were analysed among the workers. Among the 29.71% of workers, participation and control were present in only 64.42% of workers, who had stress, and 20.28% of workers who had more than one stressor had stress. Among them, 95.77% of workers had stress. It clearly showed that the stressor which causes stress in one worker was not necessary to cause stress in another worker. It depends on the ability of the worker to cope with that factor. Our findings were supported by the statements of the National Institute of Mental Health and Neuro Science (NIMHANS), which imply that stress is not always the same for everyone and what is stressful to one person may not be to another.<sup>8</sup> The analysis of the scores of the factors shows that there was only participation and control and more than one cause significantly associated with stress ( $p>0.05$ ). A study done by Kumar et al in 2011, showed that there was no significant association between occupational stress and factors associated with occupational stress.

This study has few limitations. The survey was conducted in a single geographical area, hence the result cannot be generalized. A large sample size is recommended for a more accurate evaluation of the findings.

## CONCLUSION

The prevalence of occupational stress was 78.57%, out of which 46% had mild and 28.3% had moderate occupational stress. A majority of the workers, 28.57%, had an emotional response to occupational stress. The attitudes, feelings and emotions of workers towards enterprises play a vital role in determining their performance and behaviour. Therefore, enterprises need to pay more attention to understand the work environment, enhancing the job satisfaction, and thus reducing stress at the workplace. Irrespective of any gender, the prevalence of occupational stress increased after marriage. Occupational stress had a proportionate increase with age. On multiple logistic regression after adjusting for other variables, it was found that; occupational stress was significantly associated with age. When there is no balance between the effort undertaken and the reward received, negative feelings may be triggered as a response to stress.

## Recommendations

Our findings suggested that an urgent response is needed to slow the increasing trend of occupational stress. Further study is recommended to explore the causative factors and type of response associated with occupational stress. A good and reliable instrument to measure occupational stress should be developed for further studies.

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