Research Article

Psychological stress and musculoskeletal problems among unorganized building construction workers in Chiplun, Ratnagiri district, India

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ABSTRACT

Background: At present, yearly progress of construction industry is 10% and it is included in the fastest growing industrial area of India. Workers suffering from psychological strain were unhealthy, less motivated, less productive, and unsafe at work. **Objectives:** The objective of this study is to research the sociodemographic aspect of unorganized workers and psychological strain among them. **Materials and Methods:** This cross-sectional research study was conducted at Dervan Chiplun, Ratnagiri, Maharashtra. A total of 98 construction site workers were included in the study. For data collection, researchers used the instrument "the strain inventory scale" designed and developed by Gerard Hargreaves from the strain management: The Essential Guide to Thinking and Working Smarter. **Results:** Almost 82.7% of workers have high strain and 3.6% have extreme high strain. Single workers had significantly higher strain than that of married workers. There was no significant association between strain level with respect to age, sex, and literacy level. **Conclusion:** Research unveiled that most of construction workers were suffering from strain. Employers and higher authorities should accept the concept of level of prevention through ergonomics, work design, organizational development, workers training and counseling, pre-placement and periodic examination, and enhanced occupational health services to reduce the worksite strain.

KEY WORDS: Construction Workers; Work Site Strain; Unorganized Sector; The Strain Inventory Scale; Psychological Strain and Stress

INTRODUCTION

In India, one of the rapidly growing industrial areas at present is the construction industry, which is growing at the rate of 10%.[1,2] As per the National Report of National Commission for Enterprises in the Unorganized Sector 2006, around 340 million workers (approximately 92% of total workers) are associated with unorganized sector, of which 50% are from construction industry.[3]

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The four main factors that are contributing for the strain among construction worker[4] are too much work (64.1%), pressure (59.9%), ambitious deadlines (59.7%), and conflicting demands (52.2%). According to research done by Gaurav *et al*., from Vadodara,[5] 76% of construction workers had a high level of strain. In another similar research done in Kolkata city,[6] it was observed that high strain was due to long working hours (73.3%), lower wages (60.4%), employment uncertainty (56.9%), and poor communication among workers with supervisors (22.7%).

Workers who suffered from psychological strain were unhealthy, less motivated, poorly productive, and unsafe at work.[7] It has been observed that work-related strain is one of the leading causes of absenteeism, low morale, and high rate of accident and less turnover rates. Other stressors identified were employment insecurity, sexual harassment at

work, and gender discrimination among female construction workers.[8,9] The pain associated with chronic symptoms like chronic back pain in construction workers due to bad posture may seem to be exaggerated due to ongoing various psychological stress factors such as work dissatisfaction or poor social support.[10,11]

Globally, musculoskeletal disorder is the single largest cause of work-related sickness, accounting for over 77% in the construction workers.[12] Musculoskeletal disorders have an impact on all dimensions of health-physical, social as well as mental health, and both through direct and indirect mechanisms.[13]

In spite of the high prevalence and wider range of adverse consequences, the studies highlighting the burden of psychological strain and musculoskeletal morbidities are very scarce in Indian setting. The current study is aimed at filling this vital gap in the knowledge regarding this sociodemographic profile of construction workers in unorganized sector and its association with psychological strain as well to suggest preventive measures.

MATERIALS AND METHODS

This cross-sectional study was conducted at construction sites in Dervan, Maharashtra, during the period from July to September 2017. The study population consisted of all the unorganized construction workers working at these construction sites during the study period. However, only the construction workers below the supervisory level and those who gave their consent for participation were included in the study. Following this protocol, a total of 98 construction workers were included in this study. Appropriate ethical clearance was obtained from the Institutional Ethical Committee, and the study was initiated.

Study Tool

A pre-tested standardized questionnaire of "strain inventory scale" was used to collect the primary quantitative data. The strain inventory scale was designed and developed by Gerard Hargreaves from the strain management: The Essential Guide to Thinking and Working Smarter. This scale has[14] situation-based questions that are scored from 1 to 5. This Likert type scale uses scoring method as follows: (1) Never, (2) seldom, (3) sometimes, (4) often, and (5) nearly all the time. The procedure of interpretation is based on the below cutoff score: 15–30: Experiencing a little pressure at work but generally feels in control (low strain), 31–45: Good level of control most of the time but situations cause strain occasionally (moderate strain), 46–60: Often feel under pressure and out of control (high strain), and 61–75: High level of pressure and feel out of control (extreme high strain).

Another pre-tested questionnaire designed in local language (Marathi and Konkani) was used to gain additional information regarding the sociodemographic and working conditions of the study participants.

Statistical Analysis

Data were cleaned, validated, and analyzed in the software Epi Info 7 designed by Center for Disease Control, USA. For continuous variables range, mean and standard deviation were calculated. For categorical variables, proportion and percentage were obtained. $P < 0.05$ was considered as statistically significant.

RESULTS

Table 1 presents that mean age of male workers was 20.6 years while that of female workers (23.9 years). Majority of workers belonged to 18–25 years age group in both the gender. Almost one-third of the male workers (67.2%) and less than half of female workers (43.9%) were single. Mean work experience of the construction workers in this study was 4.7 years, and mean duration working at present working site was 3.9 months. Figure 1 shows that all workers have moderate-to-extreme high strain. Almost 82% of workers have high strain and 3% of workers have extreme high strain. Table 2 presents that single unmarried workers had more significant high strain (56.4%, $\chi^2 = 6.6$, $P < 0.05$) than married workers. This study did not found any significant association of strain level with age, sex, and literacy level. Figure 2 shows that 56.4% of single and 43.6% of married workers belonged to high strain level group. Table 3 summarizes that 56.2% of male and 53.1% of female workers believed that their employment is secure. All the workers got support from supervisor, coworkers, family, and friends in their work.

Table 1: Sociodemographic characteristics of workers (n=98)

Variables	Male (%)	Female (%)
Mean age±SD	20.6±7.3	23.9±6.7
Age distribution (year)		
18–25	83.5	77.3
26–39	10.6	11.7
40–55	5.9	11.0
Marital status		
Married	32.8	56.1
Single	67.2	43.9
Literacy		
Illiterate	30.0	37.3
Primary	25.2	39.2
Secondary	22.8	6.7
Higher-secondary	22.0	16.8

SD: Standard deviation

Table 2: Association between "strain score" and sociodemographic characteristics of workers (*n*=98)

Variables	Strain score (%)			*P* value*
	Moderate strain	High strain	Extreme high strain	
Age distribution (year)				*P*>0.05
18–25	84.2	83.7	100.0	
26–39	15.8	10.0	0.0	
40–55	0.0	6.3	0.0	
Sex				*P*>0.05
Male	80.0	60.3	100.0	
Female	20.0	39.7	0.0	
Marital status				*P*<0.05
Married	17.6	43.6	100.0	
Single	82.4	56.4	0.0	
Literacy				*P*>0.05
Illiterate	28.0	33.7	0.0	
Primary	52.0	29.7	100.0	
Secondary	20.0	19.2	0.0	
Higher-secondary	0.0	19.4	0.0	

*Chi-square test

Table 3: Response of workers on their work and working condition (*n*=98)

Questions	Yes (%)	
	Male	Female
Do you fill that your employment is secure	56.2	53.1
Do you get support from your supervisor and coworkers in your work?	100.0	100.0
Do you get support from your family and friends in your work?	100.0	100.0
Do you ever fill sleeping problems?	51.9	39.5
Do you ever fill headache problem?	43.5	36.2
Do you ever fill backache problem?	42.5	37.6

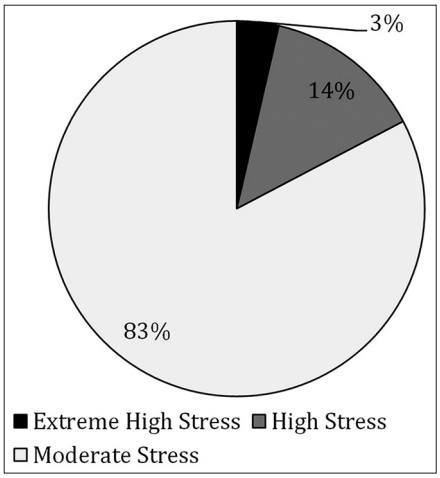

Figure 1: Strain level in workers (*n*=98)

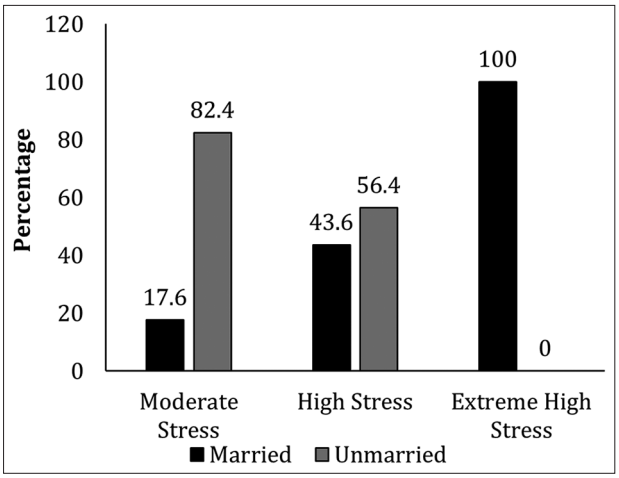

Figure 2: Strain level in married and single workers (*n*=98)

DISCUSSION

Mean age of construction site workers in this study was higher in males as compared to females. The proportion of unmarried males was higher than unmarried females. Mean work experience of the construction workers was 4.7 years and mean duration working at present working site was 3.9 months. All workers in this study experienced some level of psychological strain. There was no association of level of psychological strain and age, sex, and literacy level; however, significantly high strain was found in unmarried workers.

Major challenge for workers of unorganized sector is work site strain.[15] Mean age of male and female workers in this study was comparable with the similar research done by Gaurav *et al*.[5] and Kazuhiko *et al*.[16] This research found that almost 86% of the workers experienced a high degree of psychological strain (3.6% workers had "extreme high strain" and 82.7% workers had "high strain)." However, contrary to our findings, a higher percentage of "extreme high strain" workers were reported by Khagendra and Rachna[17] and Gaurav *et al*.[5] In another similar study done by

Tiwary *et al*.,[6] 60% of the workers in the study experienced psychological stress and strain. Ibem *et al*.[18] reported lower rates of psychological strain and stress as compared to this study. The difference may be due to different geographical settings. A study conducted in Vadodara[5] reported no significant association between psychological strain and age, sex, or literacy status. However, a significant association was noted between psychological strain score and marital status of workers in this study, which is consistent with the findings of Gaurav *et al*.[5]

Distrain, irritation, unable to concentrate, difficulty to take decision, feel less commitment to work, difficulty in sleeping, headache, backache and other physical problems of heart diseases, digestive system, and musculoskeletal disorders are the product of worksite strain.[15]

The limitation of this study is that only construction workers found during the study period were included. As construction sites are always ongoing, there is a lot of migration and many workers might have not been included. However, this study can act as a platform for performing other multicentric studies covering many construction sites at large.

CONCLUSION

According to this research, almost all the workers have high-to-extreme level of strain. To decrease the worksite strain, employers and higher authorities should accept the concept of level of prevention through ergonomics, work design, organizational development, workers training and counseling, pre-placement and periodic examination, enhanced occupational health services, etc.

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