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Psychosocial stress of the building construction workers

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ABSTRACT
Construction industry plays a vital role in development of infrastructure of a country. About 50% of the subjects of unorganised sector belonged to construction industry in our country. The questionnaire based cross sectional prospective study was undertaken to know the socio-economic status and the psychosocial stress & strain faced by the workers due to occupational exposure. The average age of the workers was 30.6±10.9 years. Majority of them (79.2%) were literates and earned below Rs 5000/-. About 59% were smokers and 37% consumed alcohol. The mean duration of present occupational exposure was 8.6±8.0 years. The workers were victim of different health impairment like occupational health hazards, psychosocial stress & strain etc. The psychosocial stress & strain were due to long working hours (73.3%), lower wages (60.4%), job uncertainty (56.9%), poor communication among workers with supervisors (22.7%). Exploitation by labour contractor, gender discrimination, sexual harassment was observed. Low job satisfaction (42.4%), injuries & accidents (47%) were also reported. About 94.6% of the workers were not aware of the different social security schemes. This occupationally exposed group of workers were victims of different psychosocial stresses & strains and other health impairments.

Keywords: *Psychosocial stress, Construction workers, Bullying & mobbing*

INTRODUCTION

Industry plays a significant role in building up of a nation. In India, construction industry plays a vital role in the development of infrastructures. It is one of the most hazardous industry. Workers belonged to organised/formal and unorganised/informal sectors. About 340 million (roughly 92% of total workers) workforce is engaged in unorganised sector of which around half of them are alone from the construction industry (NCEUS, 2006; Das, 2007; Ramesh, 2009; Rajasekhar et al., 2009). In India it is one of the fastest growing industries with an annual growth of 10% (CIDC, 2003; Baruah, 2008). It consisted of different types of job categories like raj mistry, centering mistry, marble mistry, painter,

electrician, plumber etc. Usually the workers are poor and daily wage earner. They are victims of different health hazards, diseases, psychosocial / occupational stress and strain.

Work stress is generally known for negative impact on productivity and job satisfaction among workers of different professions (McVicar, 2003; Ng et al., 2005; Ibem et al., 2011). Job stress & strain was believed to be one of the causes of absenteeism, low workers morale, high rate of accident and poor turnover rates (Wahab, 2010). Ibem et al. (2011) reported that the stress & strain among construction workers were due to work load, fixed time frame, lack of training, poor communication among workers as well as with supervisors. Leiter (1991) and Ng et al. (2005) suggested that the other causes of stress & strain among workers were inadequate room for innovation, lower wages, ambiguity of job requirement, inadequate knowledge of project objectives, long working hours, tight schedules and unfavourable working conditions etc. Lower wages and exploitation by labour contractors to the unorganised construction workers was noted by self employed women's association (SEWA, 2000).

Health Safety and Executive (HSE) suggested health priorities for construction industrial workers with reference to manual handing of building materials, hand & arm vibration syndrome and cement dermatitis (Beswick et al., 2007). It was also found that the level of stress among construction workers was more in respect of four major factors (too much work- 64.1%, pressure - 59.9% , ambitious deadlines-59.7% and conflicting demands-52.2%). Insomnia, nausea and headaches due to psychosocial stresses like job uncertainty, sexual harassment and gender discrimination in women construction workers was reported by Goldenhar et al. (1998) and Linda & Goldenher (1999).

Kaminskas and Antanaitis (2010) reported that most of the occupational diseases found in construction workers were multifactorial in nature. Huges et al. (1997) noted that psychosocial factors like job satisfaction and social support might influence the prevalence of musculoskeletal symptoms (Morken et al., 2000). Latza et al. (2002) and Abbe (2008) found that chronic low back pain in construction workers might be due to awkward posture and repetitive nature of work.

Construction workers were prone to injuries and or accidents. It was observed that the prevalence rate of injuries and accidents ranged from 5% to 41% (Shah and Jain, 2007; EI, 2008; Mehta, 2009; Joshi et al., 2011). Some other reports suggested that the prevalence rate

of injuries and accidents ranged from 18 % to 35% (Van et al., 2008; Lipscimb et al., 2006; Decklin, 2009; Hola, 2007; FACE, 2006). According to Express News Service (2008), about 17% of the construction workers met with fatal accidents.

Regan et al (2011) reported that the average body mass index (BMI) of 60.26% construction workers were high and might be categorised as obese. The average BMI of Indian men were 20.1±2.7 kg/m^2 as stated by Kuriyan et al. (2008). It may be noted that subcutaneous fat acts as a thermoregulator of the body (Chatterjee, 1985).

According to ILO (2012), the concept of decent work for construction workers is the work carried out in a safe physical environment under national law and international conventions. Government of India and State Governments enacted Acts and framed Rules for governing the work condition and workers of industries. Though the different social security schemes / measures / programmes for different working groups associated with informal / unorganized sectors including agriculture had been well circulated through mass medias by the authorities, yet the construction worker were not aware of these schemes and as such did not availed off (NCEUS, 2007; NCEUS, 2009a; NCEUS, 2009b). Li & Peng (2006) stated that 90% of the migrated construction workers from rural area were excluded from urban social security schemes and they had to pay for their own health care. It was further stated that they could not save money from their daily wages for their old age.

Research studies on occupational health especially psychosocial stresses in construction industries in India are lacking. Considering the meagreness of reports the present study was undertaken with the following objectives.

1. To know the socio-economic status of the construction workers.
2. To assess the psychosocial stress and strain faced by the workers due to exposure to work.

MATERIALS AND METHODS

This is a cross sectional prospective study. Different employment units/groups located in & around north-east part of Kolkata were selected by stratified random sampling technique. Attempts were made to cover all the workers in each selected unit. A questionnaire was prepared, tested and validated. These subjects were apprised of the study protocol. Written consent of each subject was taken for their voluntary participation. The questionnaire was administered to each worker separately individually after gaining his/her confidence.

The individual responses were noted in proforma. The socioeconomic status (age, sex, marital status, caste, income, literacy etc), occupational exposure history, psycho-social problems (bullying, mobbing, frustration, job satisfaction, boredom, job stress and strain etc.), main medical complaints were noted and different anthropometric measurements were taken. Scoring for psychosocial stresses on a scale of 5 had been done following procedure of Maier (1970a) and Brown (1974). The psychosocial problems for bonding and cohesiveness had been scored on the scale of 19 as suggested by Seashore (1954) and Maier (1970b). Height, weight (bare foot) was measured following standard techniques. Body mass index (BMI) was calculated using the formula as suggested by World Health Organisation (WHO) (WHO, 1995).

$BMI = W / H^2$

where W = weight in Kg(s)

H = height in metre(s)

Collected data was analysed using EPI INFO (WHO) software (2007).

RESULTS

The study covered 255 (male- 246, female-9) exposed construction workers. Distribution of subjects according to socio-economic characteristics had been presented in Table 1. It was observed that there were 57.6% Hindus and rest were Muslims. They mainly belonged to general caste (62.4%). It was seen that 60.8% of the subjects were married. About 79.2% of the subjects were literate. Most of the workers (57.2%) were earning below Rs.5000/-. It was difficult to maintain an average family size of 5 members with this income. In some cases, it was observed that the subjects' expenditure was higher than their income.

Construction of building involved different job categories. Here according to job similarity the subjects have been grouped into six categories. Percentage distribution of workers according to job categories had been shown in Figure 1. The main job categories were helpers- 48.2% followed by raj mistry- 24.7% and supervisors-12.2%. The workers were exposed to different types of working environment.

Table 1 Distribution of subjects according to socio-economic characteristics

Socio-economic characters		Number (%)
Gender	*Male*	246 (96.5)
	Female	9 (3.5)
Religion	*Hindu*	147 (57.6)
	Muslim	108 (42.4)
Caste	*General*	159 (62.3)
	Schedule Caste	92 (36.1)
	Others	4 (1.6)
Marital status	*Married*	155 (60.7)
	Unmarried	93 (36.5)
	Other	7 (2.8)
Education	*Illiterate*	53 (20.8)
	Literate	202 (79.2)
	1 to 5	94 (36.9)
	6 to 10	81 (31.8)
	11 to 12	14 (5.4)
	Above 12	13 (5.1)
Family type	Nuclear	149 (58.4)
	Joint family	106 (41.6)
Income	*Less than Rs. 5000*	146 (57.2)
	Rs. 5000 to Rs. 7500	66 (25.9)
	Rs. 7500 to Rs. 10000	31 (12.2)
	Above Rs. 10,000	12 (4.7)

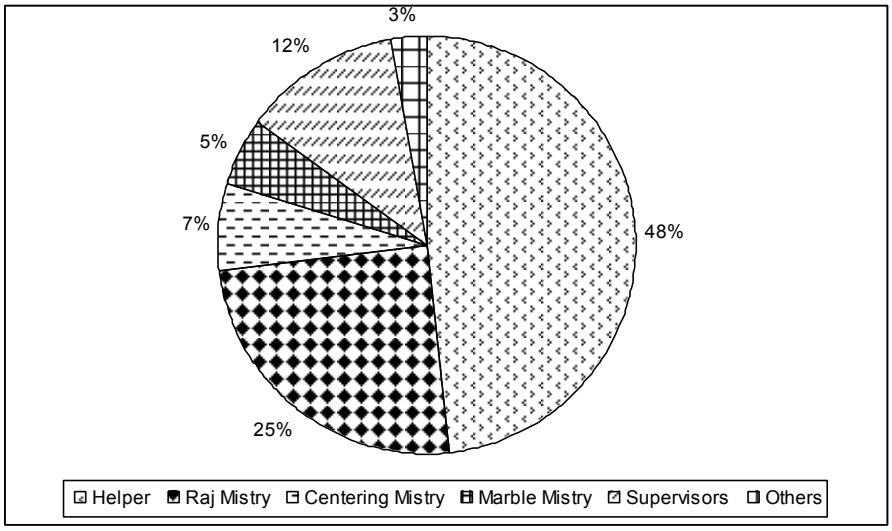


Figure-1

Percentage distribution of workers according to job categories

Table 2 Physical characteristics of the subjects (mean ± SD)

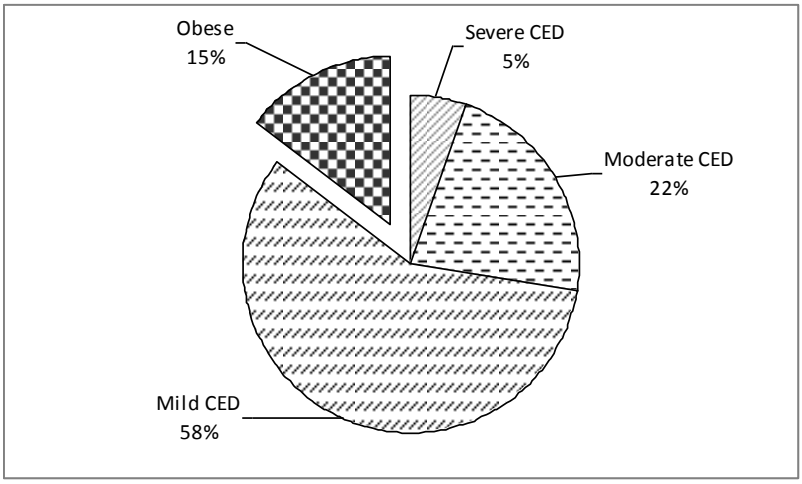
Parameter	Male n=246	Female n=9	Total n=255
Age (Years)	30.2±10.8 (16-67)	39.7±11.3 (27-65)	30.6±10.9 (16-67)
Height (cms)	162.6±5.9 (147-185)	146.8±3.9 (141-155)	162.0±6.6 (141-185)
Weight (Kgs)	52.9±8.4 (36-77)	41.3±6.9 (35-56)	52.6±8.6 (35-77)

Figures in the parenthesis are the ranges.

The physical characteristics of the subjects had been depicted in Table 2. It may be seen that the average age of the subjects was 30.2±10.8 years. It was further observed that the main bulk (64.3%) of the subjects belonged to 20-39 years age groups. The mean height and weight of the studied subject's was 162.0±6.6 cms and 52.6±8.6 Kgs respectively.

Figure-2

Percentage distribution of BMI (CED & Obese) in workers



The calculated average BMI of the subjects was 19.96±2.75 kg/m^2 (13.72-29.87 kg/m^2). The mean BMI of male subjects was 19.99±2.73 kg/m^2 and that of female was 19.10±3.52 kg/m^2. However, it was noted that about 32.7% of the subjects were suffering from chronic energy deficiency (CED) disorder with BMI < 18.50 kg/m^2. It was further observed that BMI>24.99 Kg/m^2 was found in 5.6% subjects and they might be categorised as obese. Percentage distribution of CED and obese workers is presented in figure-2. It was

observed that mild CED was found in 58% of the subjects followed by moderate CED in 22% of the total CED suffering subjects.

About 59% of subjects were smokers and smoked mainly bidi. It was also noted that 65.7% of workers in the age groups of 20-39 years were smokers and smoked on an average of 12 bidis per day. The other habits of chewing tobacco (21%), pan (12%), pan masala etc. were also noted. Addiction to alcohol was observed in 37% of subjects mainly consumed country liquor. About 10.7% of them beat their wife and children due to psychosocial stress & strain like anxiety and frustration. Alcohol consumption due to workplace bullying, mobbing, anxiety and frustration was found in 24.4% of the subjects.

The subjects were exposed to different types of working environment. The mean duration of present occupational exposure was 8.6 years. About 53% of the workers were working for more than 5 years duration. It was observed that they worked for on an average of 10.0 ± 1.9 hours per day. About 97.8% of the subjects worked on no work no pay basis. They worked from morning 6 a.m. to evening 6 p.m. with a lunch break for half / one hour. At times, they had to work even upto 12 hours. The study revealed that 47% subjects were victims of injuries/ accidents. The different types of injuries/ accidents as reported were mainly due to (a) cut by sharp objects (54.2%), (b) falling of objects from height (22.5%), (c) fall from height (15.8%) etc. The workers were not habituated of using preventing measures like helmets, boots, gloves, masks etc. Proper cleaning and washing of hand & legs after work or during lunch break was not a common practice. Rough and keratotic skin of palm & feet was found. They wore stained & dirty clothe for days together at work was also observed.

Distribution of workers according to their psychosocial stress and strain had been presented in Table 3. It was found that a good number of construction workers were suffering from job stress & strain. This might be due to low wages (60.4%), job insecurity (56.9%), repetitive work (21.6%) and bullying by superiors (22.7%). It was observed that 42.4% of the subjects were not satisfied while doing same type of work. Bullying by superiors at workplace might be responsible for anxiety and of frustration among 22.7% of the workers. About 20% of older workers felt that the new workers were not cooperating with them at the workplace. It was observed that majority of them (56.9%) were uncertain about their next day's engagement.

Table 3 Distribution of workers according to their psychosocial stress and strain

Types of psychosocial stress & strain	Numbers of subjects	Percentage
Low wages	154	60.4
Job insecurity	145	56.9
Repetitive work	55	21.6
Bullying by superiors	58	22.7
Not satisfied by work	109	42.7

About 98% of the subjects felt that they were part of the working group and would like to stay with the same group. The mean bonding cohesiveness value for staying in same group for exposed subjects was 14.6 ± 2.5 in a total score of 19. It was found that about 94.9% subjects were neither aware nor availing off the different social security measures / schemes like old age pension, accident benefits, education benefits, home loan, maternity leave etc. as available presents.

DISCUSSION

The present study showed lower percentage of schedule caste and scheduled tribes worker's participation contrary to the findings of Baruah (2008). The literacy rate (79.2%) of the present study was more or less comparable with that of Census 2011 (West Bengal) report applicable to general population (77.08%).

The average height (162.0±6.6 cms) of the subjects of present study was similar to the Indian standard height (160.7±98 cms) (Chakrabarti, 1997). The mean weight of the studied subjects (52.6±8.6 Kgs) was slightly less than the average Indian's standard weight of 55.2±11.3 Kgs (Chakrabarti, 1997). The average weight of the subjects of this study was more than that of the subjects of the earlier studies carried out in unorganized sector (Chatterjee et al, 1982; Gangopadhyay et al., 2004; Gangopadhyay et al. 2009). The average BMI for both male (19.99±2.73 kg/m^2) and female (19.10±3.52 kg/m^2) subjects of this study was found to be within normal range (18.50 to 24.99 kg/m^2). Kuriyan et al (2008) found similar average BMI for Indian males. According to WHO classification, BMI is associated with degree of underweight and or over weight which at times may be associated with risk of suffering from some diseases (WHO, 1995; WHO, 2000). The present study revealed that

about 32.7% workers were found to suffering from chronic energy deficiency (CED). Majority of subjects were suffering from mild CED (58%). A higher percentage of general population of West Bengal (male-40.5%, female-44.9%) was suffering from CED compared to that of present studied subjects (NNMB, 2002).

About 59% subjects were smokers and they used to smoke to get some relief from the work stress & strain. In a study conducted in south India reported by Sellappa et al. (2010) revealed that lesser number of construction workers were smokers than our study. Similarly the prevalence of addiction to alcohol of this study (37%) was more or less similar to the findings of Sellappa et al (42%). They usually consume alcohol to get relieved from the jobs stress & strain and for enjoyment. Excess intake of alcohol might result in loss of mental state; resulting in misbehaviour with general public, their family members etc and may lead to scolding, assaulting & beating of wife and children etc. (Tiwary et al., 2012). The other cause might be their helplessness of un-fulfilment of their daily needs. Alcoholism might be responsible for other health impairments like liver ailments etc (Tiwary & Gangopadhyay, 2011; Tiwary et al., 2012). The mean duration of occupational exposure was 8.6 years. A study by Sellappa 2010 revealed higher average duration of occupational exposure (13.3 years) than the present study. The worker of our study worked for 10 hours on an average which is more compared to than that of Indian Factories Acts maximum stipulated time of 48 hours in a week (IFA, 1948). The major cause for working for long hour might be to get maximum overtime allowances. In a report by Beswick et al. (2007) showed similar work pressure and ambitious dead lines was found which resulted in work stress & strain among construction workers.

The accident & injuries of this study (47%) was less than the report of several authors (Mbaye et al., 2001; Yu et al., 2002; Husberg et al., 2005; Lipscomp et al., 2006; Zeng et al., 2008; Shah & Mehta, 2009). Similarly, Joshi et al. (2011) and Fatality Assessment & Control Evaluation (FACE, 2006) programme observed lower rate of (5% to 35%) injuries/ accidents of construction workers than the present study. The finding of SEWA indicated similar rate of injury as observed in the present study (SEWA, 2000). These injuries/accidents were responsible for loss of man days.

The Psychosocial stress & strain amongst the studied subjects was observed in 60.4% subjects. The Psychosocial stress & strain might be due to low wages, job insecurity, job satisfaction, anxiety, frustration, repetitive work and bullying by superiors. Ibem et al. (2011)

found out lower prevalence rate of psychosocial stress & strain than that of our studied subjects. More or less similar percentage prevalence rate for bullying by superiors to the new/junior workers was also noted by Ibem et al. (2011). Our findings of anxiety due to work burden and fixed time frame compulsion of work were more or less similar as obtained by Beswick et al. (2007) and Ibem et al (2011).

The feeling of unsatisfaction, monotony, boredom due to repetitive work as obtained in our study correlated the study of different authors (Huges et al., 1997, Morken et al., 2000, Leiter, 1991, Ng et al. 2005). The present study revealed that low back pain was in 58% of subjects. It might be due to awkward posture, carrying of load, repetitive work etc. Morken et al., (2000) and SEWA (2000) reported of higher prevalence rate of low back pain compared to our findings. However, Latza et al. (2008) reported of lower prevalence rate for low back pain.

Our findings on psychosocial stress & strain due to ambiguity of job requirements (56.9%) showed lower prevalence rate than Baruah (2008) and correlated the study of Leiter (1991) and Ng et al (2005).

All most all the subjects (98%) felt that they were part of the working group and would like to stay with the same group. The main reasons most probably were familiarity of work culture and active help by the fellow workers in case of need. Comparatively, lower percentage of workers worked in a group in the study of Ibem et al 2011.

Majority of the subjects (94.9%) were neither aware of nor availing of the different social security measures / schemes like old age pension, accident benefits, education benefits, home loan, maternity leave etc. though it was already in vogue. For spread of this information each & every subjects were apprised of the different schemes / measures separately, individually during collection of data. Higher prevalence rate for workers availed off the different social security schemes was reported by Rajshekhar et al. (2009).

CONCLUSION

The construction workers were poor. Majority of them were literate. Their wages were low. Hence, fulfilment of their basic needs was a difficult proposition. The workers were exposed to different types of working environment. The subjects were suffering from chronic energy deficiency (CED) disorder and obesity. Smoking and alcohol intake is a

problem. Excess intake of alcohol might result in loss of mental state; misbehaviour with general public, their family members etc. They worked for long hours. The workers might be lacking in concentration towards work due to tiredness and work load. The injuries/accidents were responsible for loss of man days. High job demands might aggravate work stress & strain among the workers. The workers were suffering from job stress & strain. Low wages, job insecurity, repetitive work and bullying by superiors were some of the causes of occupational stress & strain. A good number of subjects were suffering from low back pain. They were neither aware off nor availed off the different available social security schemes. Individual awareness during collection of data was made. However, awareness programmes was necessary for their overall upliftment.

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Conflicts of interest disclosed: Nil

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