Original Article

A Study on the Morbidity Profile of Construction Workers in Visakhapatnam City

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Abstract

Background: Construction workers are exposed to risks that differ markedly from general industry related to occupational health and safety.

Objectives:

- To study the morbidity profile of construction workers.
- To assess the socio-demographic profile of construction workers
- To assess working conditions and facilities available at construction site.
- To know the usage of personal protective equipment (PPE) among construction workers.

Methodology: An observational, descriptive cross-sectional study conducted by Department of Community Medicine, Andhra Medical College, Visakhapatnam among 305 construction workers. All male and female construction workers aged above 14 years who were available at the construction site. After obtaining permission from the Institutional Ethics Committee, and Informed written consent data was collected. Data analysis was done by using SPSS software.

Results: In the present study the current morbidity among the study population was 46.9%. The most common morbidity among construction workers was musculoskeletal problems (34.1%), followed by respiratory disorders (30.5%), gastrointestinal problems (23.6%), skin problems (21.6%), and central nervous system problems (22.6%). About 40.7% of the study participants were using personal protective equipment.

Conclusion: Health education for workers is required to create awareness regarding workplace problems and the correct usage of Personal Protective equipment.

Keywords: Construction workers, Morbidity, Profile.

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Introduction

The construction industry is one of the most stable growing industries in the world and construction labor forms 7.5% of the world labor force [1]. According to the International Labour Organization (ILO)[2], in richer countries where labor is expensive, machines have largely replaced workers in many new construction tasks. In developing countries, where labor is cheap, most tasks are still done by manual methods with minimal use of machinery and equipment [3].

Most of the construction laborers migrate to cities and metros are from poor families and are illiterate. Their lack of education and skill make their choice very limited. When they come to big cities, they have to face several problems because of their inexperience and lack of skill. They become easy victims of exploitation and have to work for their day-to-day sustenance[4]. A wide range of activities are involved in construction and the workers engaged in this industry are victims of different occupational disorders likephysical, chemical, biological, and environmental hazards[5]. Other problems include handling different materials required for construction, and exposure to harsh environmental conditions like cold, heat, radiation, and so on, which result in accidents and adverse health conditions that can lead topsychosocial strain [6].

Not enough studies have been done on the morbidity profile of building construction workers who work at various construction sites in Visakhapatnam, (A smart city undergoing rapid urbanization) though very few studies have been done in Andhra Pradesh state. Hence this study was done to know the various morbidities of construction workers and their prevalence rates and the safety measures that those construction workers follow.

Objectives:

- To study the morbidity profile of construction workers.
- To assess the socio-demographic profile of construction workers
- To assess working conditions and facilities available at construction site.
- To know the usage of personal protective equipment (PPE) among construction workers.

Methodology

Study design: An observational, descriptive cross-sectional study.

Study setting: Department of Community Medicine, Andhra Medical College, Visakhapatnam. Greater Visakhapatnam Municipal Corporation is divided in to six zones. Two zones were selected randomly by lottery method i.e. zone one and zone two.

Sampling technique: There are 6 zones in Greater Visakhapatnam Municipal Corporation. Two zones were selected randomly by lottery method. They were zone I and zone II. A total of four construction sites were selected randomly from these two zones. Two construction sites in Zone I located in MADHURAWADA AREA and two sites from Zone II one in SEETHAMMADHARA & other in VENKOJIPALEM AREA. From each construction site seventy five construction workers were interviewed and from one construction site (Venkojipalem area) eighty workers were interviewed, there by attaining a sample size of 305.

Sample size calculation:

A pilot study was conducted to know the prevalence rate of current morbidity among 50 construction workers and that was found to be 47.8%. According to this prevalence rate, considering an allowable error of 10% at 95% confidence interval. Thus sample size was calculated by using the formula $N = 4pq/L^2$.

Where p = prevalence, q = 100-p and L = allowable error (10% of p).

Sample size (N) = $4pq/L^2$

= [(4 x 47.8 x 52.2) / (4.78 x 4.78)] = 305. ,

Hence, N = 305construction workers.

Study period: 2016 to 2017

Study population: Construction workers belonging to the selected building construction sites.

Inclusion criteria:

All males and females aged above 14 years who were available at the construction site, gave their informed consent and willing to participate in the study were included.

Exclusion criteria:

All construction workers who were not willing to participate in the study and below 14 years of age (child labor) were excluded.

1. A child is a person who has not completed his fourteenth year of age. No child shall be employed or permitted to work in any of the occupations and processes specified by the Ministry of Labour and Employment of the Government of India. (The Child Labour (Prohibition and Regulation) Act, 1986 and Rules.4.) [7].

Method of data collection:

Study participants were explained about the purpose of the study and efforts were taken for their maximum co-operation in the study. After taking the informed & written consent, detailed information of the study subjects like name, age, gender, religion, marital status, education, socio economic status and migration status was taken. History of diabetes mellitus, hypertension, whether diagnosed or treated, or taking treatment was asked. Information about working hours, work experience, morbidity conditions, working conditions, personal protective equipment usage, and details of facilities provided at work place was obtained. Blood pressure was recorded and tested for random blood sugar.

Study tools:

Pre-designed, semi-structured interview schedule, non stretchable measuring tape, Calibrated standard adult weighing scale, sphygmomanometer, stethoscope, glucometer, testing strips, lancets.

Ethical consideration:

After obtaining permission from the Institutional Ethics Committee, Andhra Medical College, Visakhapatnam (Date & Reference no. 38/IEC/AMC/2015), GVMC Commissioner, Visakhapatnam district division, Andhra Pradesh, the study was commenced. Prior permission was obtained from in charges of building construction sites. Informed written consent in the local language was taken from all the study participants who were included in the study. For those who were illiterates, the consent was read out & explained to them and consent was obtained by taking their thumb impression in the presence of a witness.

Data analysis: Data analysis was done by using SPSS software (trial version 21) and Microsoft Excel worksheet 2013. Categorical variables were represented as proportions/percentages and quantitative variables were represented as means and standard deviation. Chi-square test was done for finding out the significance of association. P value < 0.05 is considered as statistical significance at 95% confidence interval.

Results

In the present study 73.8% were males and 26.2% were females and more than half (52.8%) of the study population i.e. 51.6% of males & 56.3% of females were in the age group 20-30 years. Twenty five percent of males and 24.4 % of females (total -24.6%) were in the age group of 31-40 years. The mean age of workers was 30.87±9.02 years. The mean age of males was 30.94±9.27 years and of females was 30.69±8.30 years.

Table 1: Distribution of study participantsbased on sociodemographic characteristics

Variable	Grouping	Male		Female		Total	
		n	(%)	n	(%)	n	(%)
Marital status	Married	151	(67.1)	70	(87.5)	221	(72.5)
	Unmarried	74	(32.9)	10	(12.5)	84	(27.5)
	Total	225	(100)	80	(100)	305	(100)
Religion	Hindu	209	(92.9)	77	(96.3)	286	(93.8)
	Christian	9	(4.0)	2	(2.5)	11	(3.6)
	Muslim	7	(3.1)	1	(1.3)	8	(2.6)
	Total	225	(100)	80	(100)	305	(100)
Education	Illiterate	92	(40.9)	67	(83.8)	159	(52.1)
	Primary	26	(74.3)	9	(11.6)	35	(11.5)
	Secondary	39	(17.3)	39	(17.3)	42	(13.8)
	High school & above	68	(30.2)	1	(1.3)	69	(22.6)
	Total	225	(100)	80	(100)	305	(100)

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Socioeconomic status	Upper class	0	0	0
	Upper middle	21 (9.3)	7 (8.8)	28 (9.2)
	Lower middle	78 (34.7)	24 (30.0)	102 (33.4)
	Upper lower	100 (44.4)	43 (53.8)	143 (46.9)
	Lower class	26 (11.6)	6 (7.5)	32 (10.5)
	Total	225 (100)	80 (100)	305 (100)

In the present study, 72.5% of the study population was married. 87.5% of females and 67.1% of males were married. Most of the workers (93.8%) were Hindu by religion. Regarding educational status, 52.1% of the study population were illiterate. 40.9% of males and 83.8% of females were illiterates. The majority (90.8%) of study participants belong to low economic groups (Lower middle, upper lower, and lower classes) according to modified BG Prasad's economic classification. 46.9% belong to the upper lower class (class - IV) while 33.4% belong to the lower middle class (class - III), and only 9.2% belong to the upper middle class (class II).

Table 2: Gender-wise distribution of the study population according to current morbidity

Gender	Current morbidity		Total
	Present n (%)	Absent n (%)	n (%)
Male	100 (44.4)	125 (55.6)	225 (100)
Female	43 (53.8)	37 (46.3)	80 (100)
Total	143 (46.9)	162 (53.1)	305 (100)

Chi square value=1.040, p value= 0.308.

In the present study current morbidity among study participants was 46.9%. It was 53.8% among females whereas in males it was 44.4% and the difference between them was found to be statistically not significant (p>o.o5).

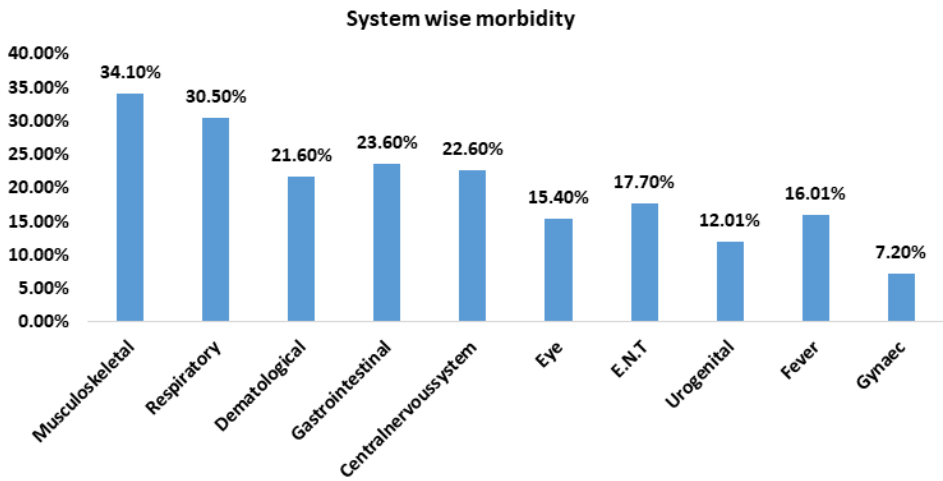

Figure 1: Distribution of study participants according to system-wise morbidity (multiple responses)

The most common morbidity among construction workers was musculoskeletal problems (34.1%), followed by respiratory disorders (30.5%), gastrointestinal problems (23.6%), skin problems (21.6%), and central nervous system problems (22.6%). Other conditions reported were E.N.T (17.7%), eye (15.4%), and urogenital problems (12.1%). 7.2% of female workers had gynecological problems.

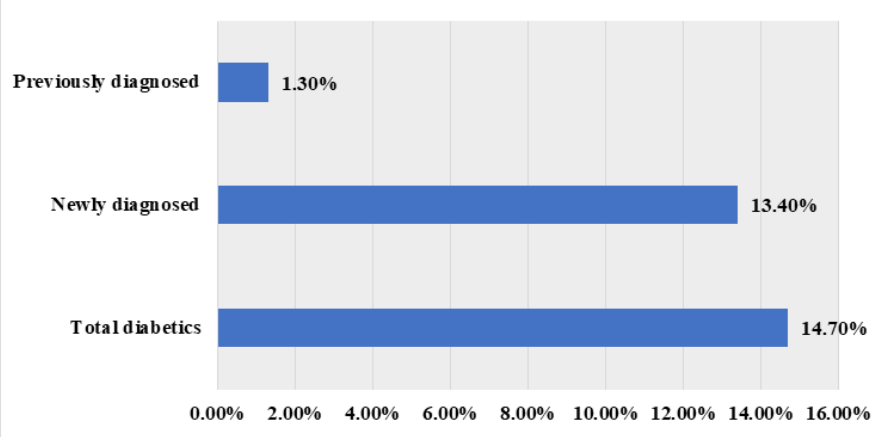

Figure 2: Distribution of study participants according to Diabetes Mellitus

In the present study 14.70% were diabetic among whom 13.4% were newly diagnosed at the time of the study.

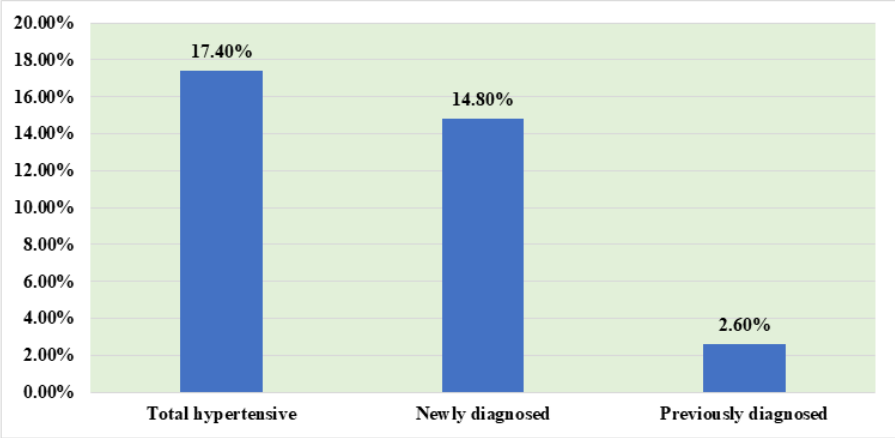

Figure 3: Distribution of study participants according to hypertension

In the present study 17.4% had hypertension, of whom 14.8% were newly diagnosed at the time of study and only 2.6% were previously diagnosed.

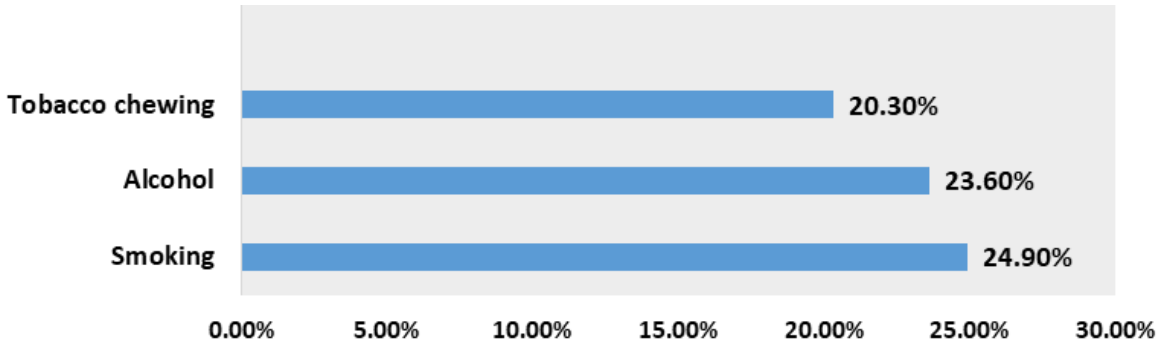

Figure 4: Distribution of study participants according to personal habits (multiple responses)

The percentage of smoking among study participants was 24.9%, the percentage of smokeless form of tobacco use was 20.3% and the percentage of alcohol usage among study participants was 23.6%. Only 3 female participants were smokers. Among smokers (24.9%), 23.3 % were using cigarettes, 1.4%

Bedi and 0.3% were using chutta. 20.3% of study participants were using smokeless form of tobacco, among 17% of the workers were using khaini as the smokeless form of tobacco.

Table 3: The association between work experience and current morbidity among study participants

Work experience	Current morbidity		Total	
	Present		Absent	
	n	(%)	n	(%)	n	(%)
<5yrs	54	(38.3)	87	(61.7)	141	(100)
5-10yrs	59	(52.7)	53	(47.3)	112	(100)
>10yrs	30	(57.7)	22	(42.3)	52	(100)
Total	143	(46.9)	162	(53.1)	305	(100)

Chi square value=0.81, p value= 0.017.

The current morbidity was more (57.7%) in the workers who had been working for more than ten years and it was less(38.3%) in the workers who had been working for less than five years and the difference between was found to be statistically significant.

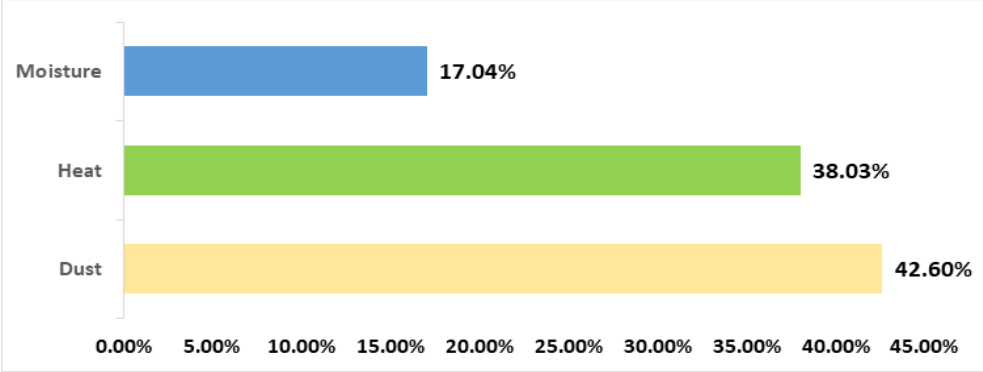

Figure 5: Distribution of study participants according to type of workplace problem (multiple responses)

Among the workers who reported workplace problems, 42.06% of the workers complained of dust, followed by heat (38.03%) and moisture (17.04%).

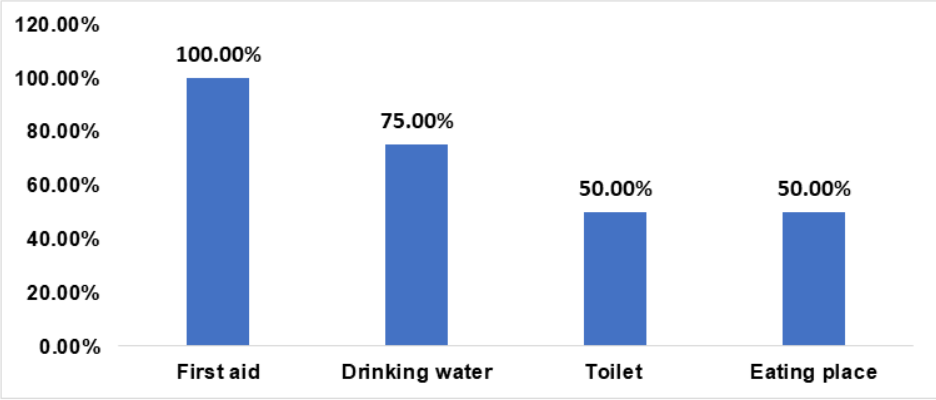

Figure 6: Distribution of facilities provided at the workplace

Out of the four construction sites the first aid facility was present at all the construction sites (100%), a drinking water facility was available at three construction sites (75%) eatingfacility was available at two construction sites (50%) and toilet facility was available at only two construction sites (50%).

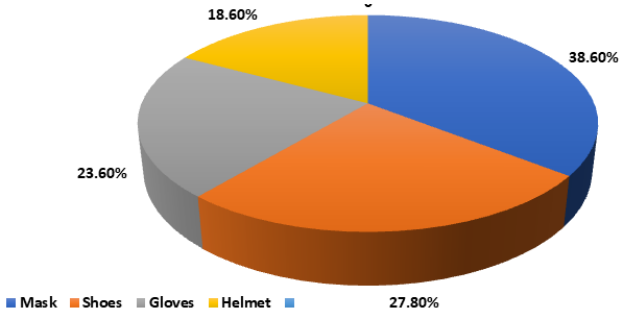

Figure 7: Distribution of study participants according to type of PPE usage (multiple responses)

Only 40.7% of the study participants were using personal protective equipment.

Among the workers who reported P.P.E. usage, 38.6% of the workers were using mask followed by shoes (27.08%), helmet (18.6%) and gloves (23.6%).

Discussion

In the present study, 73.8% were males and 26.2% were females. Present study findings were similar to the findings of a study done by Hardeep Rai Sharma et al[8] in Gondar town found that 70% were males and 30% were females.

In the present study the current morbidity among the study population was 46.9%. It was 53.8% among females and in males, it was 44.4%. This shows that morbidity was high among construction workers and it might be due to poverty, illiteracy, working environment lack of safety measures, etc. These findings were similar to the study done by Patel HC et al [9]in Surat city who reported that 48.3% had one or more complaints.

In the present study, the most common morbidity was musculoskeletal problems (34.1%) followed by respiratory disorders (30.5%), and gastrointestinal problems (23.6%). The present study findings were less when compared to studies done by Hardeep Rai Sharma et al [8]in Gondar city found that 69% of the workers had skin problems, followed by 67% of eye problems, 67% of headaches, R. B. Gurav et al [10] in Maharashtra found that 60.76% workers had musculoskeletal problems, followed by skin problems (11.46%), gastrointestinal problems (8.68%), Jayakrishnanet al [11] in Kerala stated that the prevalence of current tobacco use (60.2%), alcohol use (18.8%), respiratory diseases (14.7%), skin diseases (16.1%) and Sandeep H.et al[12]in Bengaluru reported that most prevalent morbidities among Construction Workers were Psychological Distress (43.65%), Generalized Body Pain (20.81%), Hypertension (19.63%). The present study findings were high when compared to the study done by Balakrishnan B. Adsul et al [13] in Mumbai found that the highest morbidity at the construction site was acute febrile illness (23.11%) followed by various respiratory infections (12.6%), injuries (7.9%).

In the present study, 21.3% reported injury at the workplace (males-23.1%, females-16.2%) of whom 11.5% were hurt by sharp instruments, and remaining workers the cause was falls from height. The most common part injured was upper extremity (6.2%), followed by lower extremity (4.3%), Head (2.3%) and injury on the back (1.3%). Similar observations were seen in a study done by Hardeep Rai Sharma et al [8] in Gondar city found that accidents at the worksite were 20.83% Shah CK et al.[14] in Ahmedabad the prevalence rate of injury due to all causes was found to be 25.42%, the most leading cause of injury was a particle in the eye 7.08%, followed by struck by a hammer/instrument (6.25%), falling from a height (5%), struck by a falling object (2.92%), electrical injury (2.5%) and struck by a vehicle (1.67%) and hurt by the sharp instrument was 72.92%.

In the present study, 43% reported the workplace problems (males-44%, females-41.2%). 42.06% of the workers complained of dust as work workplace problem. Other workplace problems were heat (38.03%) and moisture (17.04%). The present study findings were less when compared to the study done by Nahid Sultana et al [6] in Dhaka city 70.8% complained that dust was the majorhazard in their workplace followed by heat (61.9%), and moisture(27.6%).

In the present study, 46.2% of the workers had less than 5 years of work experience, followed by 5-10 years of work experience in 36.7% and more than 10 years of work experience in 17% of workers. The present study findings were similar to the study done by Hardeep Rai Sharma et al [8] in Gondar town found that 41% of the workers had 1 to 5 years of work experience, 43% of the workers had below 1-year work experience and 13% workers had 5-10 years of work experience.

In the present study, only 40.7% of the study participants were using personal protective equipment. Among the workers who reported P.P.E. usage, 38.6% of the workers were using masks followed by shoes (27.08%), helmets (18.6%), and gloves (23.6%). These findings were similar to another study done by Karthik R Shah et al [15] in Ahmedabad revealed that only 45.7% of the subjects were using one or the other personal protective devices, of whom the majority of them i.e. 83.3% were using gloves.

Conclusions:

In the present study the current morbidity among study population was 46.9%. The most common morbidity among construction workers was musculoskeletal problems (34.1%), followed by respiratory disorders (30.5%), gastrointestinal problems (23.6%), skin problems (21.6%), and central nervous system problems (22.6%).

Health education for workers is required to create awareness regarding the ill effects of smoking, tobacco chewing, and alcohol consumption. Safe drinking water supply must be ensured at the workplace and toilets, separate for males and females must be provided. Personal protective equipment like masks, gloves, helmets, and shoes must be used by all construction workers to reduce occupational hazards. Construction workers must undergo periodic health check-ups for evaluation of various ailments.

Limitations:

1. Construction workers engaged in activities other than building works can also be included.
2. Diagnosis of diseased conditions is based on clinical examination. Further studies with detailed investigations are recommended.

Ethics approval: (Date & Reference no. 38/ IEC/AMC/2015).from Andra Medical College Visakhapatam

Conflicts of interest: Nil

Source of Funding: Nil

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