Original Research

A study of morbidity profile amongst construction workers at selected construction sites in Surendranagar city

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Received August 07, 2016. Accepted August 26, 2016

Abstract

Background: Work plays a central role in people's lives – whether it is on a construction site, in an office or in a factory. Workers constitute a large & important sector of the world's population. The two broad categories of construction works are building & civil engineering. Construction workers in both categories are at greater risk of developing certain health disorders & sickness than workers in many other industries. They are exposed to multiple physical, chemical & biological agents, which make them vulnerable to various health problems that include injuries, respiratory problems, dermatitis, and musculoskeletal disorders (MSDs). Apart from this, in most of the construction projects, the workers employed are unorganized in nature & often not guided by the legislations made for the health & welfare of the workers & hence are not eligible for free or subsidized care. In this context, this study was conducted to understand the health problems of construction workers & to advocate public health measures for the promotion of health & prevention of diseases among construction workers.

Objectives: To assess the morbidity profile amongst the construction workers & correlate the findings with the occupational profile of the workers.

Materials and Methods: It was a Cross-sectional study carried out among 312 construction workers from 10 different construction sites selected by simple random sampling. Data was collected and analyzed by the Statistical package for Social Sciences. Microsoft Word & Excel have been used to generate graphs, tables etc.

Results: The study revealed that most common morbidity among construction workers was one or other types of minor injuries (34%) followed by skin problems (25.64%) & MSDs (19.55%).

Conclusion: Illiteracy, poor working conditions, lack of infrastructure & security, inadequate health service utilization make these workers a vulnerable population & it shows the imperative need for an overall socioeconomic development as a key for achieving the desired status.

KEY WORDS: Musculoskeletal Disorders (MSDs), Construction, Dermatitis, Injury

Introduction

Work plays a central role in people's lives since most workers spend at least 8 hours a day in the workplace, whether it is on a construction site, in an office or in a factory.[1]

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2017.07082016627	

Occupational health is concerned with health in its relation to work and working environment.[2] Workers constitute a large and important sector of the world's population. The global workforce is about 2600 million with 75% of these working people in developing countries. The total labor force in India is estimated to be 317 Million in which the organized sector employees are only 26.8 Million (8.5%) while the unorganized sector employees are as many as 290.2 Million (91.5%). Indian industry remains highly labor-intensive and often employs relatively inexpensive and hazardous technology due to financial constraints and it is true for unorganized small sectors.[3]

The two broad categories of construction works are building and civil engineering. Building applies to works

involving structures such as houses, offices, shops, factories and schools. Civil engineering applies to all the other built structures in our environments, including roads, tunnels, canals, dams, railways, and docks.[4] Construction workers in both categories are at a greater risk of developing certain health disorders and sickness than workers in many other industries.[5] They are exposed to multiple physical, chemical and biological agents, which make them vulnerable to various health problems that include injuries, respiratory problems, dermatitis, musculoskeletal disorders and gastrointestinal diseases.[4,6] The work is hard physical labor, often under difficult conditions like adverse weather conditions and the nature of work, hours of work, low pay, poor living conditions with lack of basic amenities and separation from family, lack of job security and lack of access to occupational health services making the situation worse.[6,7] Due to ergonomic issues, they are also vulnerable to degenerative disorders. Apart from this, in most of the construction projects, the workers employed are unorganized in nature and often not guided by the legislations made for the health and welfare of the workers and hence are not eligible for free or subsidized care.[8,9]

In India they are mostly migrants from remote villages, often less[10] educated and not cautious about different preventive measures. Most of them are inter-state migrants and have poor language skills that prevent them from understanding the safety precautions given and to voice their problems. [9]

In this context, this study was conducted to understand the health problems of construction workers and to advocate public health measures for the promotion of health and prevention of diseases among construction workers.

Materials and Methods

This was a cross-sectional study carried out among 312 construction workers from 10 different construction sites. The construction projects in the district were listed (n = 37) from District Labor Department. Different construction sites located in and around part of Surendranagar city were identified and 10 construction sites were selected by the simple random method to get sufficient sample size. Total coverage of workers in each selected site was attempted (except those who were absent and were of age <14 years). These workers were appraised of the study protocol and a written consent of each worker for their voluntary participation was obtained. Data was collected through oral questionnaire method using pretested Performa. The data was analyzed by Statistical package for Social Sciences (SPSS), Microsoft Word and Excel were used to generate graphs, tables etc.

Results

This Study shows that majority of the subjects 140 (45%) were in the age group of 15-30 years, 39% were between 30-45 years of age, 14% were 45-60 years age group and only 2% were above 60 years of age. Out of total 312 workers, 89% were Hindus and the rest were Muslims (11%). Among them, around 88% (274) workers belonged to Gujarat. Only 12% (38) workers were from the other states like M.P. (16), Rajasthan (8), U.P., Bihar etc. (Table 1). According to nature of job (Figure 1) around 76% workers were unskilled while 24% were skilled workers and according to duration of job in present occupation (Table 2) around 31% workers have <5 years

Table 1: Distribution of workers according to age & sex

Age (in years)	Sex		Total
	Male	Female	
15-30	112(80.00%)	28(20.00%)	140
30-45	81(66.39%)	41(33.61%)	122
45-60	33(73.33%)	12(26.67%)	45
>60	05(100%)	00(00.00%)	5
Total	231	81	312

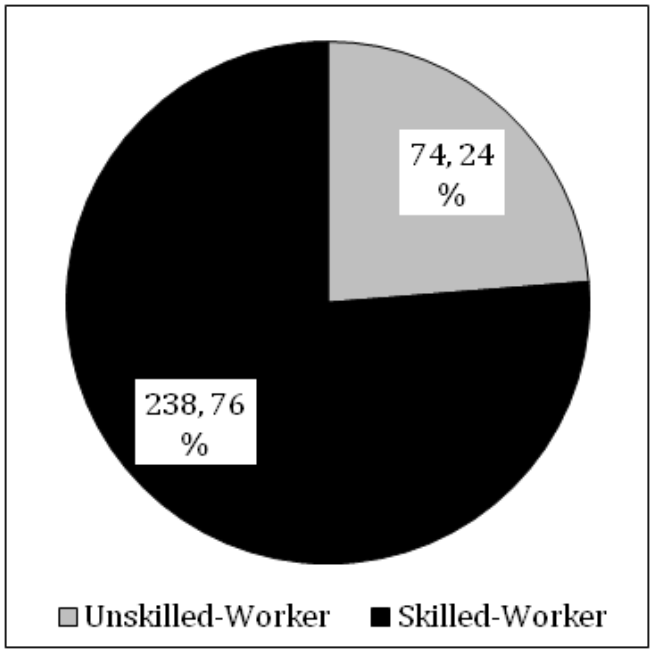

Figure 1: Distribution of workers according to Nature of job or Occupation

Table 2: Distribution of workers according to duration of job in present occupation

Duration of job (in years)	No. of workers	Percentage (%)
<5	96	30.77
5-20	165	52.88
>20	51	16.35
Total	312	100

of experience, 53% workers were having 5-20 years of experience and 16% workers were more than 20 years of experience. Regarding working hours in a day (Figure 2) around 77% workers were working for more than 8 hours per the day. In morbidity pattern, (Table 3) shows that about 61 (19.55%) workers had musculoskeletal problems like low back pain, weakness, body ache, joint pain etc., while 19 (06.09%) reported fever, 17(5.45%) reported diverse types of respiratory complaints like cough, breathlessness, chest pain etc. Nearly 28 (8.97%) were suffering from ophthalmic problems, which were mainly watering and redness in the eye. Around 15 (4.81%) respondents complained of gastrointestinal problems such as abdominal pains, constipation, diarrhea, and hemorrhoids. Among these, 80 (25.64%) had several types of skin problems like dermatitis and itching. Gynecological problems were in 10(3.21%) females and only 2.56% workers were suffering from injuries at work. Further in-depth analysis of problems; (Figure 3) shows that among 80 workers who had skin problems, 73(91%) were having only itching, while only 7(9%) workers had dermatitis; 64% of workers had skin problems in arms/ hands/ palm, and 53% in legs while only 8% and 1% workers had skin problems in abdomen and face respectively. And the skin morbidity was found statically significant (χ^2 is 33.893 and P<0.0001) with duration of job (Table 8). Findings for MSD in relation with the type of work (Table 4) shows 44% of workers were engaged in lifting and carrying activity, 26% in prolonged banding, 18% were in repeated movements and 12% were working at high places and problem of MSD was not found statically significant with duration

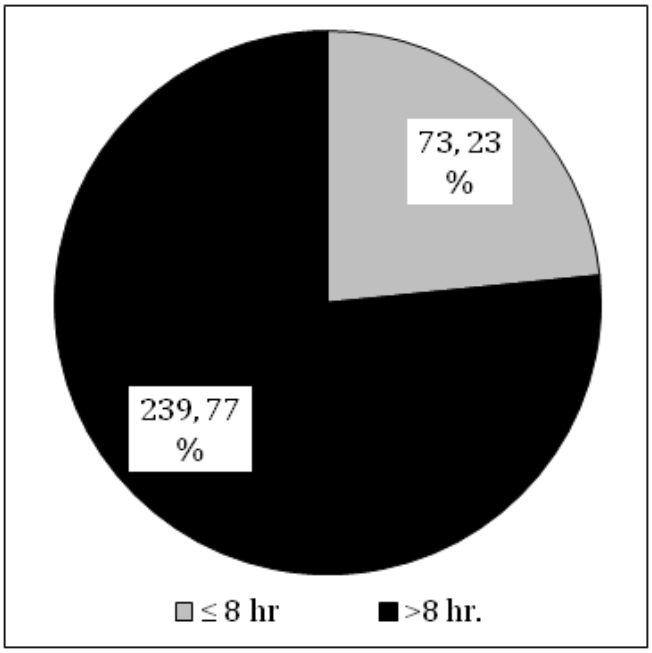

Figure 2: Distribution of workers according to total working hours in a day

Table 3: Distribution of workers according to present morbidity

Morbidity	No. of workers	Percentage (%)
Musculoskeletal disorders	61	19.55
Fever	19	06.09
G.I. problems	15	04.81
Headache	14	04.49
Respiratory Problems	17	05.45
Gynecological problems	10	03.21
Skin problems	80	25.64
Ophthalmological problems	28	08.97
Injuries	08	02.56
No problem	195	62.50

*Multiple response answers

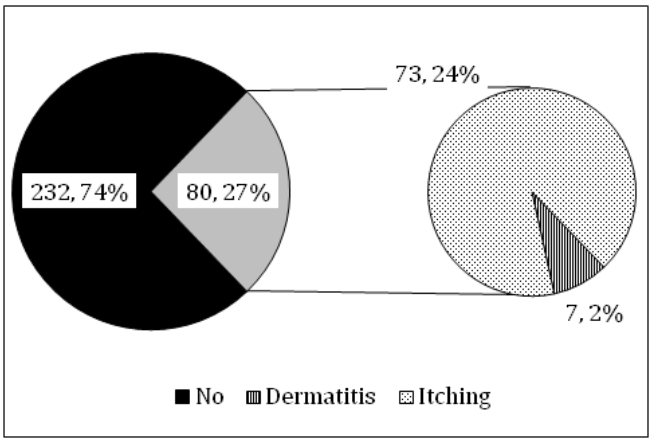

Figure 3: Distribution of workers according to dermatological problem

Table 4: Association between duration of work in present occupation and skin morbidity

Duration of work (in years)	Skin morbidity		*P*-value
	Yes	No	
<=10 years	51(63.75%)	146(62.93%)	χ^2 = 33.893
>10 years	29(36.25%)	86(37.07%)	*P*<0.0001
Total	80	232	

Table 5: Distribution of workers according to their type of work in relation to MSD

Type of workers	No. of workers with msd	Percentage (%)
Lifting & Carrying work	27	44.26
Repeated movements	11	18.03
Prolonged banding	16	26.23
Working on height	07	11.48
Total	61	100

of job or working hour (Table 7). Regarding injuries, (Table 5) shows that most of the workers had suffered from mainly from abrasion (53%), followed by cut injury (22%), Prick (15%), Blunt trauma (8%) and laceration (7%) respectively. And the relation of work type work with injuries (Figure 4) shows that injuries were common in labor work (62.62%). Labor work includes works like carry sand/ cement/ brick/ concrete etc., preparing a mixture of water/ sand/ cement, digging land, carrying clay, helpers in skilled work etc. Other works where injuries present were electric/plumbing/carpeting (12.15%), Centering (10.28%), masons (6.54%), scaffolding (5.61%) and still binding (2.8%) respectively. (Table 6) shows that 77% of h/o of injuries were in unskilled workers and rest was in skilled workers and difference observed was not found statistically significant (χ^2 is 0.00117 and *P*=0.9728).

Table 6: Association between MSD with duration of work and working hours in day of workers

Variables	MSD		*P*-value
	Present	Absent	
Duration of work			
≤10 years	33(54.10%)	164(65.34%)	χ^2=2.203
>10 years	28(45.90%)	87(34.66%)	*P*=0.1377
Working hours in a day			
>8	45(73.77%)	194(77.29%)	χ^2=0.171
≤8	16(26.23%)	57(22.71%)	*P*=0.6789

Table 7: Distribution of workers according to type of injury

Type of injury	No. of workers	Percentage (%)
Abrasion	57	53.27
Cut injury	23	21.50
Laceration	07	06.50
Prick	16	14.95
Blunt trauma	09	08.41

*Multiple response answers

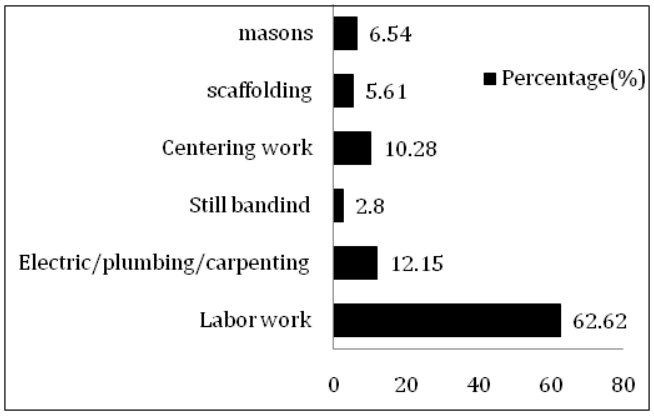

Figure 4: Distribution of injuries according to type of work

Table 8: Association between H/O of injury with nature of work

Nature of work	H/O of injury		*P*-value
	Present	Absent	
Unskilled	82(76.64%)	156(76.10%)	χ^2=0.00117
Skilled	25(23.36%)	49(23.90%)	*P*=0.9728
Total	107	205	

Discussion

In the present study, the majority of the workers were belonged to 15-30 year of age group, while morbidity was common among 30-45 years of age group. Most of the workers were unskilled and working more than 8 hours a day. The study revealed that the most common morbidity among construction workers was one or other types of minor injuries (34%) followed by skin problems (25.64%) and MSDs (19.55%).

Regarding age group of construction workers, 45% workers belonged to 15-30 years age group followed by 39% from 30-45 years, 14% from 45-60 years and 2% from >= 60 years age group. Similar results were found in the studies like Tiwary et al[11], BB Adsul et al[7] and H Patel et al[12].

Around 16% workers were from age group 15-19 years. Poverty was the main reason to join the construction industry and school drop outs. This age group is the most crucial for education and career building opportunities which are denied to these unfortunates. Parents need to be counseled regarding the importance of education and should be motivated to allow their children to complete their studies.

Maximum morbidity was found in the age group of 30-45 years (47%) followed by 15-30 years (40%). BB Adsul also found similar findings in his study.[7]

There were 76% unskilled workers and 24% skilled workers in our study. Daily wages for unskilled workers ranges from Rs.180 to Rs.250 and for skilled workers ranges from Rs.400 to Rs.650. To cope up with the daily requirements, they had to take loans from their relatives, friends etc. This hardship might result in stress and strain among workers which can contribute to the morbidity of the workers.

There was no statistically significant association between type of work and morbidity status in this study. But H Patel et al[12] and BB Adsul et al[7] reported a significant association between type of occupation and morbidity status.

This study revealed that 63% workers were working in the construction industry for <= 10 years while the rest were working for more than 10 years. Tiwary et al [11] noted in his study that 66% of the workers were working less than five years duration.

About 77% workers worked more than 8 hours a day. Similar results were also reported by Tiwary et al[11] in his study. Most of the workers were engaged on no work no pay basis. They worked from morning 8 a.m. to 8 p.m. The

maximum stipulated hours of work by Indian Factories Act 1948 was 8 hours per day. But for earning more and urgency of completing the work in fixed time, they had to work for long time for which they got minimum overtime allowance.

There was no significant association between working hours/ duration of work with morbidity status of workers which was similar to studies of H Patel et al[12] and Jayakrishnan.[13]

In the present study, dermatological problems were most common. (25.64%) They were mainly itching and dermatitis. Similar findings were also observed by Trivedi Ashish et al[14] where dermatological problems were 20.3% in the form of dermatitis and itching. But in studies by S Srinivasan [15], Kartik Shah et al[8], Adsul BB et al[7], R B Gurav et al[6], Kuruvila M et al[16] and BL Chawda et al[17] , dermatological problems were 56%, 48%, 4.71%, 11.46%, 12.48% and 10.5% respectively.

Skin problems such as fungal infections, contact dermatitis are very common in the construction industry. Contact with cement and lime may lead to irritant dermatitis. The presence of chromate and cobalt in cement is known to cause allergic contact dermatitis.

Around 36% of the workers with skin morbidity, were working in the construction field for more than 10 years while 64% of them were working for less than 10 years and the difference observed was found statistically significant. Most of the skin lesions were mainly in the upper extremities (63.75%). Similar results were also observed in studies by Trivedi Ashish et al [14] and Jayakrishnan et al [13]. This may be attributed to poor hygiene practices like hand washing and nonuse of gloves and overcrowding.

Prevalence of MSD reported in our study was 20%. It includes body ache, backache, weakness, joint pain etc. Similar result was also found in the study conducted by Sameer valsangkar et al[18]. In other studies prevalence of MSD was higher as in H Patel et al (38.7%)[12], SEWA study (74%)[19], Sarika Manhas (44%)[20], Trupti Bodhare et al (77%)[21] and BL Chawda et al (30%)[17]. In this study, the prevalence of MSD is less probably due to less manual activity, as the work is mostly mechanized and younger age of workers.

Among workers with MSD problems, 44% of workers were engaged in lifting and carrying activity, 26% in prolonged banding, 18% were in repeated movements and 12% were working on height suggesting that all these activities make construction workers more vulnerable to MSD.

Association was present between duration of work in present occupation and working hours in a day. Trupti Boghare et al [21] reported statistically significant association of MSD with working hours and duration of work in construction industry. The most commonly affected region was the back, followed by neck and knees closely. The use of human labor in lieu of machinery for moving weights, lack of ergonomic training regarding proper weight lifting and distribution are all contributory to the involvement of these joints and are highly amenable to prevention.

This study revealed that around 34% workers had a history of injuries during last 3 months during the present occupation. Most of the workers had suffered from abrasion mainly (53%). Injuries were common in labor work (62.62%) like carry sand/cement/brick/concrete etc., prepare a mixture of water/sand/cement, digging land, carrying clay, helpers in skilled work etc. which make them more vulnerable to injury. Similar results also reported by Shah and Mehta.[22]

The study had the limitation in the form that it was a cross-sectional study, temporalities, causation of the health outcomes were not proved and the actual incidence could not be recorded. We had not gone to their residential places, hence could not establish the actual association between their housing conditions and surrounding environment on their morbidity status.

Recommendation

The study clearly shows the imperative need for an overall socioeconomic development as a key for achieving the desired status. There has to be a political will and efforts from government to initiates scheme to ensure that the root of socioeconomic development reaches the common man living in far-flung areas of the country.

Conclusion

The study concluded that illiteracy, poor working conditions, lack of infrastructure and security, inadequate health service utilization make these workers a vulnerable population.

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How to cite this article: Jasani PK, Nimavat JH, Joshi JB, Kartha GP. A study of morbidity profile amongst construction workers at selected construction sites in Surendranagar city. Int J Med Sci Public Health 2017;6:382-387

Source of Support: Nil, **Conflict of Interest:** None declared.