

Issues of Occupational Health and Injuries among Unskilled Female Labourers in Construction Industry: A Scenario of Punjab State

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ABSTRACT Unorganized sector of work is full of health hazards and injuries and if the workforce is female, the scenario worsens. Therefore the present investigation was undertaken with an objective to find injury and disease data of female construction workers. Results of study revealed that most of them belonged to the age group of 21-30 years, were married and lived in nuclear family setup. Mean weight and height of respondents were below the normal value. Cardiovascular responses, Basal Metabolic Index and Body Surface Area were very much within normal value. Injury data of sampled population revealed incidences of abrasion of skin, falls, slips, trips, crushing and pinching of body parts, boils in hands and feet, burns, sprains, cuts and bleeding and eye injury/hurt being more frequent occurring injuries during work. Illness data of respondents correlated affect of work on their health as most frequently reported illnesses were: weakness, cough/chest infection, urinary tract infection, sore throat, cervical pain, skin allergy, dehydration, back pain, generalized fatigue and heat stroke.

INTRODUCTION

In urban sector, increasing numbers of workers have taken up construction work as a means of immediate employment, which provides cash earnings at the end of the day. The rural masses also migrate towards urban areas in search of jobs and get involved in this second largest occupation. It has grown much faster immediately after the government has adopted the strategy of liberalization, privatization and globalization. In the year 1998, there were 111 million construction workers worldwide and the majority belonged to the developing economy like India. This is because employment intensity is much higher in the low income countries than the high income ones (Pandey 2009).

Moreover, the fatal injury rate for the construction industry is higher than the national average in the unorganized sector. It is one of the most hazardous and accident prone occupation as reported by International Labour Organization (ILO 2011). Globally, 17 percent of all work-related fatalities are in the construction

sector (ILO 2011). The construction industry is a mobile one, where the workers move from site to site. The labourers working in harsh circumstances and living in unhygienic conditions suffer from serious occupational health problems and are vulnerable to diseases. Death and injury from accidents in the Indian construction sector is widespread. India has the world's highest accident rate among construction workers. Survey by Indian Labour Organization (ILO 2009) found that 165 out of every 1000 workers are injured in the construction sector. Construction work is featured by high labour turnover, constantly changing work environment and conditions on site, and different type of work being carried out simultaneously. All these factors caused by temporary nature of the job create a high-risk environment. Health hazards in the construction industry can be grouped under mechanical and non-mechanical hazards. Mechanical hazards include accidental issues from impact, penetration from scrap metal and sharp objects and crushing. Non-mechanical hazards are major cause of occupational diseases and physical problems (Chauhan and Sharma 2003). Most of the studies undertaken since the 1980s point to the poor health of women construction workers. Basu et al. (2009) mentioned some of the health problems in their study on worksite injuries in female construction labourers included: severe muscular pain, intestinal problems, gastroenteritis, fevers, coughs and colds,

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pains and more serious ailments like pneumonia, tuberculosis, leprosy, etc. By and large, all the studies have documented that women have to work almost till the last day of pregnancy, and come back soon after delivery according to report by National Commission on Women (2005). Considering the above facts in foreground, the present investigation was conducted with following specific objectives:

1. To examine the incidences of work related injuries among female construction workers in Punjab state.
2. To know occupational diseases encountered by women engaged in construction industry.

METHODOLOGY

The study was conducted in randomly selected two sites, one in within and another in outskirts of Ludhiana city. A sample consisting of 80 female workers up to the age of 40 years engaged in construction industry as unskilled labourer were selected from 8 randomly selected construction sites. Four sites were taken from within and another four from the outskirts of Ludhiana city. These were: construction sites for auditorium and international guest house at PAU; a showroom in Ghumar Mandi; a shopping complex at Bharat Nagar Chawk; industry at Jalandhar bypass; a showroom at Samrala Chawk; a Mall at Ambala Road and Basant Avenue extension between Pakhowal and Dugri Road. The average number of female workers was 10 from each site, thus comprising total sample of 80 workers. Pretested interview schedule was used to seek both background and specific information from the selected respondents. For recording physiological parameters of the respondents medical instruments were used. Heart Rate Monitor was used to record heart rate, automatic digital wrist blood pressure monitor to measure blood pressure and clinical thermometer to measure body temperature of respondents. Weighing machine was used to measure weight and anthropometer rod to record height and stethoscope to record respiration frequency of respondents. All these scientific instruments were used using standard techniques. Basic Metabolic Index (BMI) was calculated from the recorded values of height and weight of the subjects by using the following formula:

$$\text{BMI} = \text{Weight (Kg)} / \text{Height (m)}$$

To examine environmental conditions of the work site, environmental kit was used. It included Room thermometer, Noise level meter Lux meter and Hygro meter.

Body surface area (BSA) was calculated from the recorded values of height and weight of the subjects by using the following formula (DuBois and DuBois formula):

$$\text{BSA (m}^2\text{)} = 0.007184 \times \text{Height (cm)}^{0.725} \times \text{Weight (kg)}^{0.425}$$

The collected data were analyzed and interpreted using frequency and percentage mean scores.

RESULTS AND DISCUSSION

1. Demographic and Physiological Characteristics of Female Construction Workers

Majority of the respondents (55.00%) were in the age group of 21-30 years, followed by 37.50 percent who were of 31-40 years (Table 1). Madhok (2005) also indicated in her report on National Commission on Women, that none of the women was over 40 years of age, as contractors prefer young women only. She further disclosed that as construction work is extremely taxing, most of the women are young (average age 25) having joined the workforce even before they reached their teens. Majority (97.50%) of the respondents were married. It was probably due to the fact that when men migrated to construction sites, they brought their wives along, so married women were part of major female workforce.

Table 1: Demographic features of women construction workers (n=80)

<i>Demographic features</i>	<i>No.</i>	<i>% age</i>
<i>Age (years)</i>		
Upto 20	6	7.50
21-30	44	55.00
31-40	30	37.50
<i>Marital Status</i>		
Married	78	97.50
Unmarried	2	2.50
<i>Family Type</i>		
Joint	32	40.00
Nuclear	48	60.00

Data enfolded for physiological parameters of respondents in Table 2 reveals that the mean

Table 2: Physiological parameters of the women engaged in construction industry (n=80)

<i>Physiological</i>	<i>Observed value (mean)</i>	<i>Recommended value/norm</i>	<i>Deviation from recommendation</i>	<i>Reference</i>
Weight (kg)	44.53±6.31	54.4 kg	22.16%	1CMR report (2010): Average weight and height of Indian females between 20-40 years age
Height (cm)	158.4±4.08	164.0 cm	3.53%	
Heart rate (beat/min)	74.23±3.52	70-80 beat/min	-	Guyton A C and Hall J E (2007). Textbook of medical physiology. New Delhi.
Body temperature (°C)	37.05±2.45	37°C	-	
Systolic blood pressure (mm/hg)	119.37±3.81	120 mm/hg	.53%	
Diastolic blood pressure (mm/hg)	82.13±2.29	80 mm/hg	2.60%	
Respiration rate (breath/min)	16.89±1.95	12-18 breath/min	-	Indian Council of Medical Report, 2010
Body surface area (m ²)	1.52±2.45	1.6 m ²	5.26%	
Basal metabolic index (kg/m ²)	18.54±3.41	19-25 kg/m ²	3.46%	

weight of the respondents was 44.53±6.31kgs which was 65.48 percent less than normal value (54.4 kg) as recommended by the Indian Council of Medical Research. This might be due to the fact that they were undernourished but involved in extremely heavy manual labour. This double torture made them underweight. Mean height of the respondents was 158.4±4.08 cms which was also less than normal value, that is, 164.0 cm as revealed in ICMR (Indian Council of Medical Research) Report (2010). This may be due to the reason that they were mainly the migrants (from outside state) who were short statured. It was also found that all the respondents had the heart rate in the normal range with the mean of 74.23±3.52 which came under the normal category, that is, 70-80 beat/min (Guyton and Hall 2007). Temperature of the body was also found to be normal in all the respondents. The blood pressure of the respondents was also measured and it was found that systolic and diastolic blood pressure came under the normal category which indicates of good cardio vascular system because of physical endurance achieved (due to hard manual labour) thereof. The blood pressure of the respondents was 120/80 mm Hg (exactly in a normal range). The mean respiration rate (breath/min) was 16.89±1.95 breath/min among all the respondents. It was calculated and observed that the mean body surface area and BMI (Body Mass Index) was 18.58±2.45 and 18.54±3.41 respectively. Both values were comparable to normal range and found to be within limits.

2. Injury History of Female Workers in Construction Industry

Table 3 discusses about the distribution of respondents according to frequency of injuries inflicted due to construction work. Seventy percent of the workers said that they had recently suffered from abrasions of skin and 45 percent said that they had recently fallen and injured themselves. This may be due to the fact that the workers do not have any supportive gear and the construction sites also do not have railings to prevent them from falling. Crushing and pinching of body parts due to building materials was also reported as 'recently encountered incidence' as disclosed by 47.50 percent respondents. About half of the respondents reported to have experienced cuts, bleeds, eye injury or hurt 'once or twice' since they entered this unorganized work sector and insect bite 'in past few months'. None of the workers said that they had never received any cuts. Almost half of the respondents (42) said that they got cuts 'ones or twice'. Reports by National Commission on Women (2005) on women in construction sector also support these findings.

About 25 percent of the respondents said that they had boils in their hands and feet in the past few months. This can be partly attributed to the fact that many workers do not wear any footwear and hence experienced boils or numbness in the extreme temperatures. About 85 percent of the respondents said that they never had any fractures, only 5 percent said that they 'recently'

Table 3: Nature and frequency of injuries experienced by respondents due to construction work (n=80)

Type of injury	Incidences of injury		Injury infliction frequency			
	Yes	No	Once or twice	Past few months	Recently	Mean score
Abrasion of skin	64	16(20.00)	0(0.00)	8(10.00)	56(70.00)	2.88
Sprains	48	32(40.00)	0(0.00)	8(10.00)	40(50.00)	2.83
Crushing and pinching of body parts	56	24(30.00)	0(0.00)	18(22.50)	38(47.50)	2.68
Internal injury	18	62(77.50)	0(0.00)	10(12.50)	8(10.00)	2.44
Swelling of body parts	54	26(32.50)	4(5.00)	24(30.00)	26(32.50)	2.41
Fractures	12	68(85.00)	0(0.00)	8(10.00)	4(5.00)	2.33
Falls/slips/trips: body jerks thereof	72	8(10.00)	24(30.00)	12(15.00)	36(45.00)	2.16
Boils in hands and feet	74	6(7.50)	30(37.50)	16(20.00)	28(35.00)	1.97
Burns	74	6(7.50)	20(25.00)	36(45.00)	18(22.50)	1.97
Puncture of foot sole by pointed edges	58	22(27.50)	20(25.00)	22(27.50)	16(20.00)	1.93
Cuts and bleedings	80	0(0.00)	42(52.50)	22(27.50)	16(20.00)	1.67
Eye injury/hurt	80	0(0.00)	42(52.50)	26(32.50)	12(15.00)	1.62
Bite/sting by insects	68	12(15.00)	22(27.50)	42(52.50)	4(5.00)	1.59

Figures in parenthesis indicate percentage

had a fracture. Almost half of the respondents said that they had sprains every once in a while, this can be because of the fact that most of the workers do not maintain the required posture for the type of work they performed. Das et al. (2007) also revealed that although the load carried by these workers is within the permissible limit, but their rigorous work schedule can be attributed to the high incidence of work related musculoskeletal disorders. About 32.50 percent of respondents reported that they had swelling in the various parts of the body in the recent past. This recurrent occurring of swelling may be due to the fact that the workers do not lift weight properly and assume improper postures of the body. Cuts and bleeding was one of phenomena which was not much 'frequently occurring incidence' as experienced by most of the workers, as only about one third of the respondents (22) reported that they had cuts and bled on the construction site. Building material and tools used in construction site seem to be the main reason for such injuries. NIOSH (National Institute of Occupational Health and Safety) has ample data supporting these findings.

3. Illness History of Female Workers in Construction Industry

Table 4 shows the distribution of respondents according to illnesses caused due to involvement in construction work. From the Table, it can be inferred that all the respondents experienced incidences of cough and chest infection, dehy-

dration, cervical pain, cold and fever at one time or the other since their employment. Huge number of respondents (70-76) also reported problem of skin allergy, sore throat, back pain and heat stroke in their occupational history. Fifty eight respondents admitted feeling generalized fatigue, weakness and constant headache due to excessive loads they have been transporting, followed by 56 of them reporting urinary tract infection as major annoying illness. Miscarriage was reported by only 18 respondents followed by 38 women who reported asthma problem. National Institute of Occupational Health in Ahmedabad has also documented reproductive issues of such women.

As regards frequency of occurrence pattern of these illnesses, it was observed that highest mean score (2.82) was assigned to 'urinary tract infections' followed by 'weakness/generalized fatigue' which scored 2.80 according to pattern of occurrence. Incidences of 'miscarriage' (those who reported these were 18 respondents) were however recent as indicated by mean score (high) of 2.77, followed by complaint of constant headache (mean score 2.51), asthma (2.47 mean score), sore throat (mean score 2.05) and cough/chest congestion (mean score 2.00). Least frequently encountered illnesses for which occupation was held responsible were: cold and fever (mean score 1.30). Most recently occurred illnesses recorded during present investigation were: weakness/generalized fatigue and urinary tract infection (as reported by 46 respondents). Illnesses which were encountered in past few

Table 4: Nature and frequency of illness/health problems caused to respondents due to involvement in construction work (n=80)

Type of illness	Occurrence of illness		Frequency of illness			
	Yes	Never	Once or twice	Past few months	Recently	Mean score
Urinary tract infection	56	24(30.00)	0 (0.00)	10(12.50)	46(57.50)	2.82
Weakness/generalized fatigue	58	22(27.50)	0 (0.00)	12(15.00)	46(57.50)	2.80
Miscarriage	18	62(77.50)	0 (0.00)	4 (5.00)	14(17.50)	2.77
Constant headache	58	22(27.50)	0 (0.00)	28(35.00)	30(37.50)	2.51
Asthma	38	42(52.50)	4 (5.00)	12(15.00)	22(27.50)	2.47
Sore throat	74	6 (7.50)	20(25.00)	30(37.50)	24(30.00)	2.05
Cough/chest infection	80	0 (0.00)	22(27.50)	36(45.00)	22(27.50)	2.00
Skin allergy	76	4 (5.00)	22(27.50)	42(52.50)	12(15.00)	1.87
Dehydration	80	0 (0.00)	34(42.50)	36(45.00)	10(12.50)	1.70
Back pain	76	4 (5.00)	34(42.50)	34(42.50)	8(10.00)	1.66
Heat stroke	70	10(12.50)	42(52.50)	10(12.50)	18(22.50)	1.66
Cervical pain	80	0 (0.00)	54(67.50)	14(17.50)	12(15.00)	1.48
Cold	80	0 (0.00)	68(85.00)	0 (0.00)	12(15.00)	1.30
Fever	80	0 (0.00)	68(85.00)	0 (0.00)	12(15.00)	1.30

Figures in parenthesis indicate percentage

months were: skin allergy, cough/chest infection, dehydration, back pain and sore throat as reported by sampled population of 52.5 to 37.5 percent. Illnesses which were faced just once or twice (rarely occurring) were cold and cough as 85.00 percent respondents reported.

Thorough scrutiny of the table revealed that most of the illnesses which frequently occurred were mainly due to the occupation they were in. Constant feeling of weakness was perhaps caused by strenuous task of manual material handling they have to perform. Frequent occurring chest infection and coughs were probably due to polluted surrounding air, urinary tract infection occurrence was due to holding of urine and unhygienic toilets at work site. Cervical pain was also essentially due to head load carrying of heavy bricks etc. The illnesses which did not seem to be occupation related were of rare occurrence. Lakhani (2004) too revealed similar findings in his study on occupational health of women construction workers. Madhok (2005) also presented views of female workers in Delhi, stating that 'construction work' is the only kind of work left open to women; work is very strenuous and they lift loads of up to 100 kg, so their hands and feet pain. They vomit often because of stink of garbage. She narrates a case study in which women reports of constant head ache even years after she left working. It appeared to her that load she used to carry has come to exit permanently on her head. Just by touch on head, pain started off very severely. These revelations are a matter of concern.

CONCLUSION

It can be thus concluded from the present study that incidents of work related injuries are very high among the female labourers engaged in construction industry; primarily the occupation being severely hazardous and women lacking training and required physical endurance for such strenuous job. Accidents at such sights are waiting to happen and it is certainly not a occupation for the fairer sex. Occurrence of diseases is also due to hazards of work place like lot of dust, chemicals, harsh climatic conditions, no place to even pass urine (leading to urinary tract infection), no drinking water facility and heavy load carrying leading to musculoskeletal disorders. However, since women have this occupation as first available job opportunity especially when they migrate to mega cites, there is a need to at least device laws and other compensations to safeguard welfare of such women by government and employing agencies.

RECOMMENDATIONS

1. Owners/contractors at construction sites should ensure safety measures to reduce accidents and injuries.
2. There should be provision of medical aid and ambulance for accident victims.
3. There should be separate toilets and adequate privacy for women workers to reduce frequent occurrence of urinary tract infections.

4. Women should be provided with protective gadgets while at work.
 5. Load limit should be set lower for women workers and correct working procedures explained to them to reduce musculoskeletal disorders.
 6. Tools should be made women friendly.
- Women workers should be provided with maternity benefits and wage equality

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