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Work-Related Musculoskeletal Problems and Risk Factors of Brick Kiln Female Workers

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ABSTRACT
Thirty women workers working in brick kiln were selected for the study. Musculoskeletal problems of the workers were identified by using the body map and intensity of pain was recorded by using five point scale (Ranjwan, 2000). The study indicated that musculoskeletal problems of women workers while performing brick carrying activity were very severe in case of neck (70%) and in shoulder (63.3%) and all female workers working in brick kiln faced risk factors i.e. brick fall on leg, burn to hand and eye injuries. Study indicated immediate and urgent need to develop safety measures for female brick kiln workers.
Key words: *Brick kiln, musculoskeletal problems, brick kiln workers, Risk factors*

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INTRODUCTION

The Indian brick industry is the second largest in the world after china. Brick manufacturing work is an age old profession practiced all over the world employing large number of migrant workers including men, women and even children. In this industry a lot of manual material handling (MMH) tasks is performed.

The manual brick manufacturing process in India has been going on for centuries and millions of people are employed. A large number of female workers are engaged in this field. In unorganized sectors, these workers are recruited temporarily on a seasonal basis and thus are neither trained nor sufficiently experienced. Therefore, they do not have any previous knowledge about unsafe acts and hazards related to this work or they simply ignore the safe working process, as also seen among the female construction labourers of India [2, 3, 4].

In the developed countries some mechanization was introduced but various studies show that the workers working in brick manufacturing units suffers from musculoskeletal problems [5]. Musculoskeletal disorders (MSDS) resulted from frequent trunk bending, twisting and repetitive handling of several bricks at a time.

Moreover, some studies report that women have higher prevalence rate of work related musculoskeletal disorders than that of men [9, 4]. According to Bridger [1] static relaxation is the cause of pain in the neck and cause of degeneration of spine. Lifting of head loads is a kind of static work where in muscles of neck and seven top most spines of spinal cord are under continuous compression. The impact is gradually transferred to lower part of spinal column. The inactivity of muscles retards the blood supply to the area and causes deposition of waste resulting in pain extending to even thoracic region and lower body. The pain in neck and shoulders is directly related to lifting loads on head indicated that most of the respondents, that is, 76.66 per cent tribal women reported pain in the neck and total of 46.66 per cent tribal women reported pain in shoulder [6].

.MATERIAL AND METHODS

The present study was carried out in brick kiln area of Parbhani city of Marathwada region of Maharashtra state. Purposive random sampling was followed to select thirty female workers who were

involved in brick kiln industries for performing brick carrying activity since 5 years. The selected subjects were healthy and without any physical deformities and illness. The women workers between the age ranges of 25-50 years were selected. A questionnaire based survey was conducted on brick kiln female workers and observations of field while performing work in brick kiln for identifying risk factors faced by female workers were recorded. Incidences of musculoskeletal problems of the female workers were identified by using the body map viz. neck, shoulder, joint, upper arm, elbow, hand/wrist, calf muscles, and ankles/feet. The incidence of pain was recorded after the completion of the activity. The intensity of pain in the above stated parts of the body was recorded by five point scale [8].

RESULT AND DISCUSSION

Table 1 shows all the risks faced by brick kiln female workers and the causes of risks. It was clear from the table that brick kiln workers faced risks such as brick fall on leg, burn to hand, crack fingers; fall down, skin damage, skin peels, and eye injuries and to stumble. (Plate 1.)

All female workers reported that brick fall on leg, burn to hand and eye injuries were major risk factors in brick kiln. Major reasons for these accidents were reported such as variation in level of floor and work surface, carrying warm bricks, heavy load and heavy air movement in brick kiln. This data clearly indicated that there is vital need to develop safe tool for carrying heavy and warm bricks and also workers should use some safety device such as sun glasses to protect the eyes from heavy wind. To avoid stumble and falls, level of floor of the brick kiln need to be made uniform. Similar results were reported by Mukhopadhyay [7] regarding brick manufacturing units Gujarat states of India. Musculoskeletal problems experienced by female workers were assessed while performing the brick carrying activity in conventional method which is presented in Table 2. From the experiment, it was observed that 70 per cent of the selected female workers who performed the brick carrying activity experienced very severe pain in neck, followed by severe pain in shoulder (63.3).Severity of pain were moderate in case of elbow (50%) and thigh muscles (50%) and calf muscles (46.6 %).

Table 1: Risk factors while performing work in brick kiln and their reasons

Sr.No.	Risk Factors	Reasons of the accidents	Percentage and frequencies
1	Brick fall on leg	Physical strain &fatigue	30 (100)
		Loosing balance	15(50)
		Over exertion	5(16.6)
		Variation in level of floor & work surface	2(6.6)
		Due to negligence	2(6.6)
		Heavy physical load	13(43.3)
2	Burn to hand	carrying Warm Brick	30 (100)
3	Crack finger	Handling Sharp edged tools such as moulds	12(40)
		Due to glass pieces and stone in clay	9(30)
4	Fall down	Physical strain &fatigue	17 (56.6)
		Repetitive Movements	13(43.3)
		Over exertion	7(23.3)
		Variation in level of floor & work surface	21(70)
		Due to illness	9(30)
6	Skin damage	Exposure to sun and dust	21(70)
7	Skin Peels	carrying Warm brick	7(23.3)
8	Eye injuries	Heavy air movements in brick kiln	30(100)
9	To stumble	Repetitive movements	13(43.3)
		Variation in level of floor & work surface	8(26.6)

Figure in parenthesis indicate percentage

Table.2: Musculoskeletal pain while performing Brick carrying activity by conventional method

Name of the body part	score while performing brick carrying activity					Total Score
	Very Severe Pain (5)	Severe Pain (4)	Moderate Pain (3)	Light Pain (2)	Very light pain (1)	
Neck	21(70)	6(20)	3 (10)	_	_	138
Shoulders	7(23.3)	19(63.3)	4 (13.3)	_	_	123
Upper arm	3(10)	12(40)	12(40)	3 (10)	_	105
Elbows	-	11(36.6)	15(50)	4(13.3)	_	97
Hands/wrists	-	8(26.6)	9(30)	13(43.3)	-	85
Upper Back	5(16.6)	17(56.6)	8(26.6)	-	-	117
Lower Back	18(60)	7(23.3)	5(16.6)	-	-	133
Thigh muscles	-	12(40)	15(50)	3(10)	-	99
Knee	-	15(50)	9(30)	6(20)	-	99
Calf muscles	-	13(43.3)	14(46.6)	3(10)	-	70
Ankles/feet	-	15(50)	7(23.3)	8(26.6)	-	97

Figure in parenthesis indicate percentage

CONCLUSION

Common risk factors reported by all brick kiln female workers were brick fall on leg, burns to hand and eye injuries. Musculoskeletal problems of female workers while performing brick carrying activity with conventional methods were in case of neck and shoulder. Hence, it can be concluded thatthere is immediate and urgent need to develop safety measures for female brick kiln workers

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