

Study of Musculo-Skeletal Discomfort in Female Workers of Brick Industry

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Abstract: *Background:* India ranks second in the brick manufacturing sector in world. It is an unorganized sector and workers are under continuous stress of work to increase the productivity with fewer resources and less management skill. Workers are at high risk of discomfort and physical strain that can lead to musculo-skeletal discomfort. *Objective:* Objective of our study was to outline the musculo-skeletal discomfort of female workers in brick kiln in Karad. *Method:* Socio-economic status of female workers was studied by standard questionnaire. Pain assessment of female workers was done by Numerical pain rating scale of National Initiative on Pain Control™ (NIPC™). *Result:* Pain assessment revealed that female workers complained about shoulder, head, knee, lower back pain, thigh, arm pain etc varying between moderate to worst category. *Conclusion:* With proper ergonomic practices and use of appropriate tools or equipments and adequate period of rest between works, the musculo-skeletal discomforts of female workers can be reduced.

Keywords: Female workers, musculo-skeletal discomfort, pain assessment

1. Introduction

Brick industry in India generates seasonal employment for workers i.e. for 6-7 months and rest of the year workers have to search for other source of income. Brick industry in India comes under unorganized sector. Workers are under continuous pressure of work to increase the productivity with less resources and management skills. In Karad city bricks are made manually and whole family of the workers work in the same working environment. Female workers carry out the responsibilities of domestic work as well as carry out the brick work for adding to family income. Due to repetitive work and same working posture for long hours and less rest period the female workers face many musculoskeletal discomforts. Common jobs of female workers in brick kiln comprises of pushing, pulling, bending, stretching, sitting, standing, walking, preparation of clay, molding of clay, drying of clay, preparing the kiln for firing of bricks, loading and unloading the bricks. Female workers are at high risk of physical strain which can lead to musculoskeletal discomforts. Maximum stipulated hours of work by Factories Act 1948 are 8 hours per day but workers work for 10-12 hours a day. According to ILO maximum weight recommendation, 1967, (No128) an adult man can carry up to 55kg wt, but female or weak person should carry less compared to healthy adult man. But these rules are hardly seen to be practiced in the brick industry. Female workers become disinterested and tired due to repetitive discomforts in the body. This leads to ill effects on their health and fitness level.

2. Methods

2.1 Study of socio-economic status

By frequent survey of the selected brick kiln in Karad hundred female workers were selected for the study. A written consent was obtained and an ethical clearance for the study was obtained for the study from an ethical committee. Study of socioeconomic status of

selected female workers was done by using self administered standard questionnaire.

2.2 Study of the musculo skeletal discomfort

Study of musculo skeletal discomfort was done by using standard questionnaire and information was collected. Selected female workers were studied for the musculoskeletal discomfort using numerical pain rating scale of National Initiative on Pain Control™ (NIPC™). We used a numerical pain rating scale. Female workers were instructed to choose a number from 0 to 10 that best describes their current pain 0 would mean no pain and 10 would mean worst possible pain and 5 would mean moderate pain.

3. About the Study Area

Karad is one of the brick manufacturing regions in Satara district in Maharashtra. Karad block is in upper Krishna sub basin from where ample alluvial soil is available as main raw material for brick manufacturing. Karad has approximately 300 kilns operating in each season. In Karad mostly clamp kiln are manufacturing 1, 00,000 bricks/kiln/year. Bricks are manufactured manually with help of hand mold, dried in open area with solar energy and burned on traditional kilns. Four brick kiln was selected in Karad for the study. Study was conducted with total 100 female workers from selected kilns.



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4. Objectives of the Study

- 1) To examine the socio-economic conditions of female worker engaged in some selected brick kiln.
- 2) To study the musculoskeletal discomforts of the selected female workers in the brick kiln of Karad
- 3) To make concluding remark.

5. Result

Hundred female workers of selected brick kiln in Karad city was studied for the socioeconomic status and musculoskeletal discomforts and following results were found.

Table 1: Distribution of subjects according to Socio economic characters

Socio-economic characters		Number of female worker (%)
Religion	Hindu	46
	Muslim	54
Caste	General	9
	OBC	42
	Scheduled caste	26
	Scheduled tribe	18
Education	Illiterate	55
	1 to 3	39
	3 and above	6
	3-5	32
D rs	1	6
	2-3	49
	4 and above	37
No of children	unmarried	8
	Up to 5 years	64
Work experience	6-10	15
	11-15	8
	16-20	6
	21 and above	7
Income	15,000-20,000	63
	20,000-25,000	37

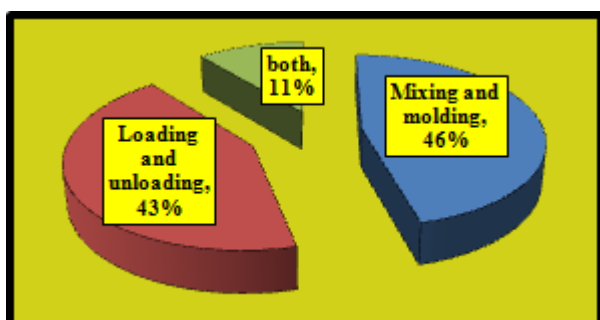


Figure 1: Distribution of female workers of brick industry according to type of work.

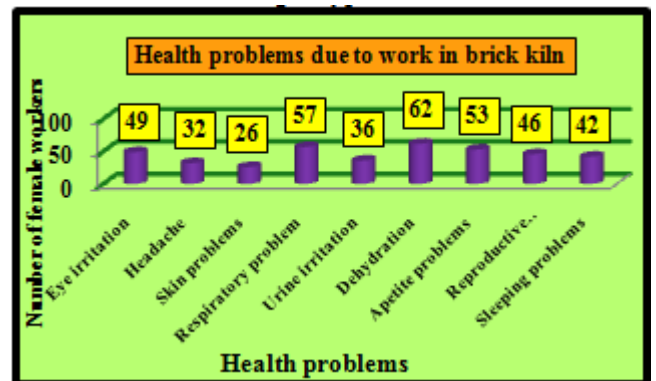


Figure 2: Health problems of female workers due to work in brick kiln

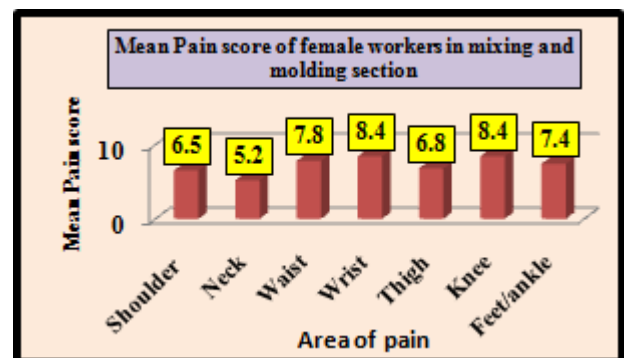


Figure 3: Pain score of female workers in mixing and molding section of brick industry.

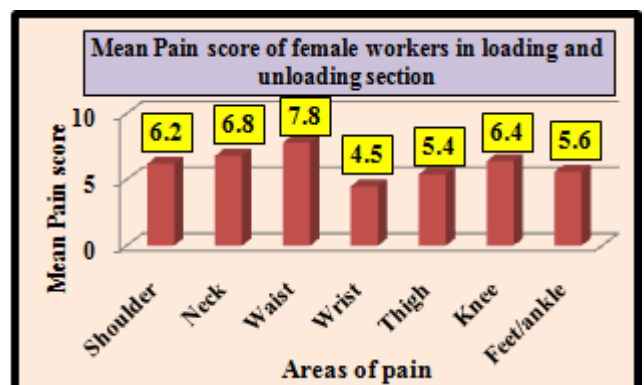


Figure 4: Pain score of female workers in loading and unloading section of brick industry.

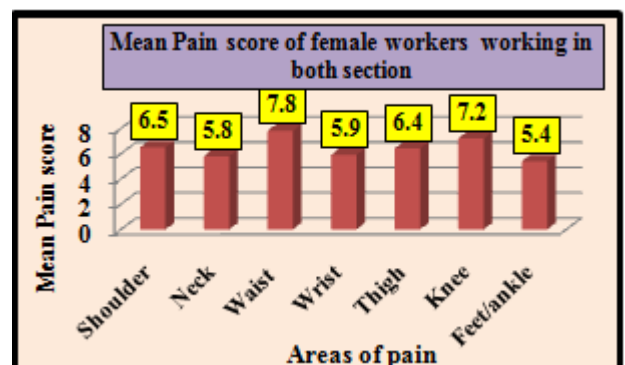


Figure 5: Pain score of female workers working in both section of brick industry.

6. Discussion

Female workers were present in two sections mixing and molding and loading and unloading. In Karad bricks are made manually with hand molds and production of bricks depends on workers totally. So workers are under constant work pressure to increase the production of bricks. Female workers live in the working environment with their family. On studying the socio-economic status of female workers in brick kiln it was found that majority of the female workers come from a poor economic background and are illiterate. Female workers showed large family size and many of them have more than three children. Most of the female workers in selected brick kiln in Karad are from other backward classes which are followed by scheduled caste and scheduled tribes. There are more married females compared to unmarried working in the brick kiln in Karad. Female workers are introduced into the work at very early stage of her life to increase the income of the family. Most of female workers are migrant and few are locals reasons given by the female for working in brick kiln is mostly due to poverty and illiteracy while local females gave reasons of work available at a single place for 6-7 months. Female workers are given wages of about 20-25 thousand annually. Female workers get money according to the bricks they mold or load and unload. They receive no medical facilities and amenities. Money is borrowed from the owner for medical emergency and it is deducted from the wages of workers. Female worker have no proper lunch time.

Family of the female workers work as a unit. From the fig no 3 and 4 we can see that the female workers of mixing and molding section complained about more pain in the lower part of the body and female workers in loading and unloading section complained more pain in upper part of body. From fig no 5 Female workers working in both sections perceived more pain in different body parts. A female worker doing molding has to make the molds, keep it for drying and after bricks are dried has to arrange it one upon other leaving some space between each brick. A molder female worker molds 1000-1200 bricks per day. They remain in the sitting position on the ground for long period which leads to pressure on knee, thigh, back, spinal cord and on shoulders and feet as well. This posture can lead to pooling of blood in the feet. This awkward posture can lead to musculoskeletal discomforts and can cause fatigue. Female worker in loading section has to carry the bricks to form a kiln and also to load and unload the bricks from the vehicle. Female worker carry 12-14 bricks on her head. A female worker carries 1500 bricks per day. Female workers in loading and unloading section complained about pain in cervical region, upper back, knee, shoulder and waist. Female workers in molding section wakes up before sunrise at 3-4 am for molding as molding in hot environment becomes difficult due to drying of the clay prepared to form molds. Due to less sleep and continuous work female workers become disinterested and their health is affected. Working in the same posture for long time causes pain and stress in the body. Female workers complained about body pain, cervical pain, lower back pain, thigh and knee pain, shoulder pain, eye irritation, urinary irritation, skin problems, respiratory problems, reproductive problems etc.

Female workers have no working hours and they work continuously without rest affecting their health.

Few female workers were engaged in both type of work. Their pain scores were more due to high stress. These female workers complained about pain in shoulder, thigh, waist, knee, wrist, feet, and neck. According to the standard questionnaire musculoskeletal pain was felt at work by only 6% of female workers while 86% of female workers felt pain after their whole day work in the evening. 8% of female workers felt pain in different body parts when they went to sleep at night. As the females come from poor family they have to work for the money even if they encounter the pain in the body.

7. Recommendation

- 1) The problems of musculo skeletal discomfort can be prevented by properly designing the work and working environment
- 2) Proper tools and equipments should be used for the work
- 3) Worker friendly technology can be introduced to reduce the hardships associated with brick work.
- 4) Lift loads from appropriate (knuckle) height
- 5) Keep the travel distance for the lift to less than 10 feet
- 6) Molders should be given a sitting table at suitable height from ground so that pressure is not created on lower part of their body.
- 7) Proper working hours and rotation of workers should be practiced to reduce work stress of workers
- 8) Exhaustive and comprehensive legislation is urgently needed for regulating working conditions, wage structure, welfare measures of the women workers in the brick kilns.

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