



STUDY OF WORKPLACE ENVIRONMENT AND EFFECT ON PHYSICAL FITNESS OF FEMALE WORKERS OF BRICK INDUSTRY

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Abstract:

India stands second in world in brick manufacturing sector. Workers are under continuous pressure of work to meet the increasing demand of bricks. Objective of the study was to study working environment and its effect on fitness of female workers. Workers work in open environment and heat, toxic gases and dust put a lot of stress on the workers physical fitness. Fitness of female workers is affected badly reducing their health status.

Keywords: - working environment, pressure, physical fitness, health status.

Introduction:

Brick industry in India still remains unorganized and no official authentic data is available regarding its status. Brick industry is one of the unorganized industries in India. India is second largest producer of clay fired bricks accounting for more than 15% of global production. Brick industry in India is labor intensive industry employing million of workers. A worker in brick industry is mostly migrant and economically poor. According to census (2011) more than 85% of the working population in India works in unorganized sector and out of these at least 120 million are women [5]. Female workers in brick industry are almost equal in number to male workers. Female workers carry work of bearing and rearing of children along with work in brick kiln. The work of women in brick industry is least recognized and effect of the work on health of female workers is less studied. Female workers come from poor economic class and are mostly illiterate in brick industry. Female worker are seen in mixing and molding and loading and unloading sections. Workers live in the same working environment and encounter the toxic fumes coming out from the kilns, dust, and radiant heat affecting their health leading to many health problems. Female workers are not benefitted with adequate wage and medical facilities [1]. Working for long hours in same position, lack of rest and improper diet the physical fitness of female workers is greatly affected. Female workers get affected physiologically and psychologically.

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

Methodology

Socioeconomic study

After obtaining an ethical clearance one hundred and thirty female workers were selected for the study. These female workers were interviewed as per standard questionnaire to gather socioeconomic information. Written consent was obtained from the female workers and the owners for the study.

Study of workplace environment

Monitoring of particulate and gaseous pollutants

To evaluate the air quality in and around brick kiln area, high Volume Environ Tech air sampler was used. The main pollutants considered for the study include suspended particulate matter (SPM), respirable suspended particulate matter (RSPM/PM10), Fine particulate matter (PM 2.5), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂). The sampling instrument was set up 3 meters above ground and 8 hourly values for all pollutants were measured at each site. The method for measuring SO₂ was adapted from West and Gaeke [6]. The principle of NO₂ measurement in atmospheric samples was described by Jacob and Hochheiser [4].

Physical fitness study

Anthropometric measurement like height, weight was calculated to study the body mass index of female workers. Pulse rate was studied by carotid pulse and blood pressure was measured by sphygmomanometer. Fitness score was calculated by Havards modified step test. Peak expiratory flow rate of female workers were measured to study lung function.

Results

Table 1:- SOCIOECONOMIC CONDITION OF FEMALE WORKERS IN SELECTED BRICK KILN IN KARAD

Socio-economic characters		Number of female worker (%)
Religion	Hindu	56
	Muslim	74
Caste	General	9
	OBC	58
	Schedule d caste	36
	Schedule d tribe	27
Education	Illiterate	84
	1 to 3	40
	3 and above	6
No of children	1	6
	2-3	64
	4 and above	48
Work experience	unmarried	12
	Up to 5 years	76
	6-10	27
	11-15	12
	16-20	8
Income	21 and above	7
	15,000-20,000	63
	20,000-25,000	67

Table:-2-Measurement of air quality

Sr. No	Parameter	Mean Values (µg/m ³)
1	Suspended particulate matter (SPM)	1569.76±1.15
2	PM 10	573.64±1.82
3	PM 2.5	608.25±1.02
4	NO2	152.40±0.02
5	SO2	70.76±0.06

3) Result of the physical fitness study

CHART NO-1: BODY MASS INDEX OF THE FEMALE WORKERS IN BRICK KILNS

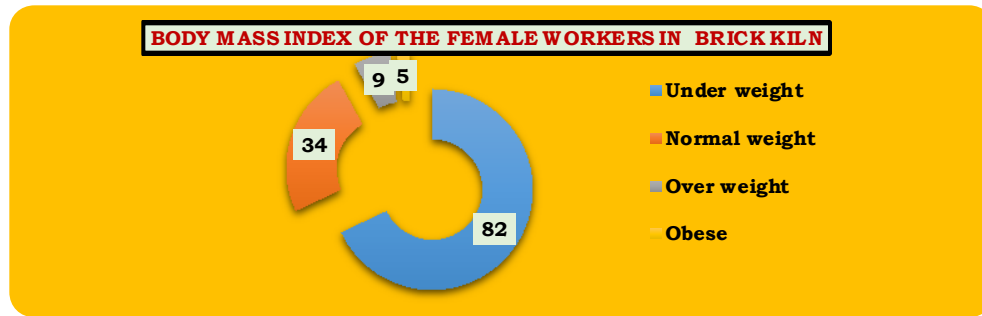


CHART NO-2: FITNESS PERFORMANCE OF THE FEMALE WORKER IN BRICK KILN

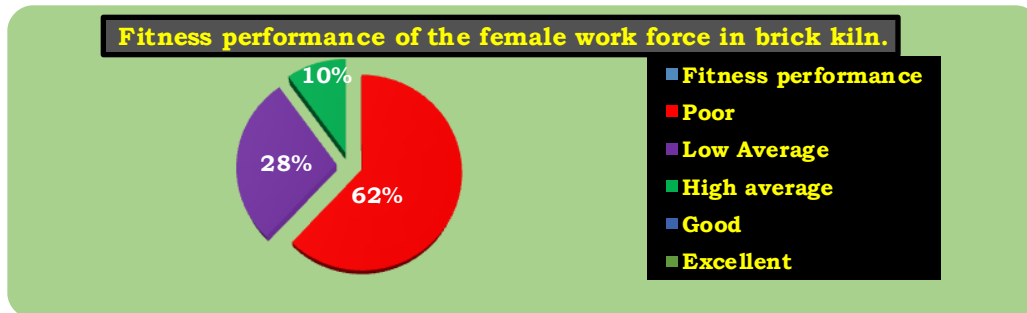


CHART NO-3:- MEAN PULSE RATE OF FEMALE WORKERS IN BRICK KILN

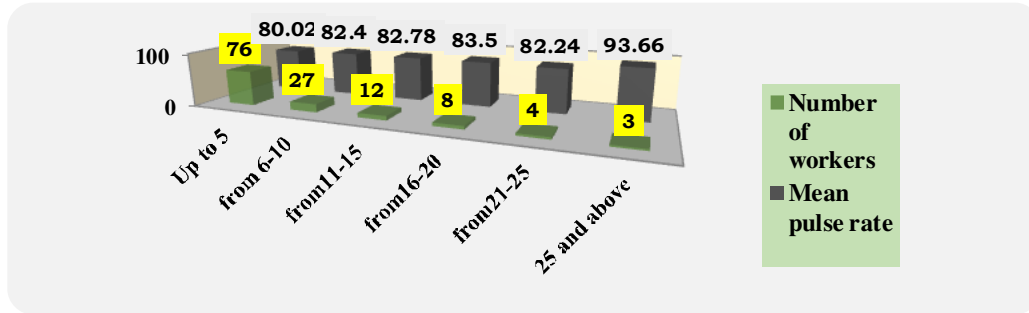


CHART NO-4: MEAN BLOOD PRESSURE OF FEMALE WORKERS IN BRICK KILNS

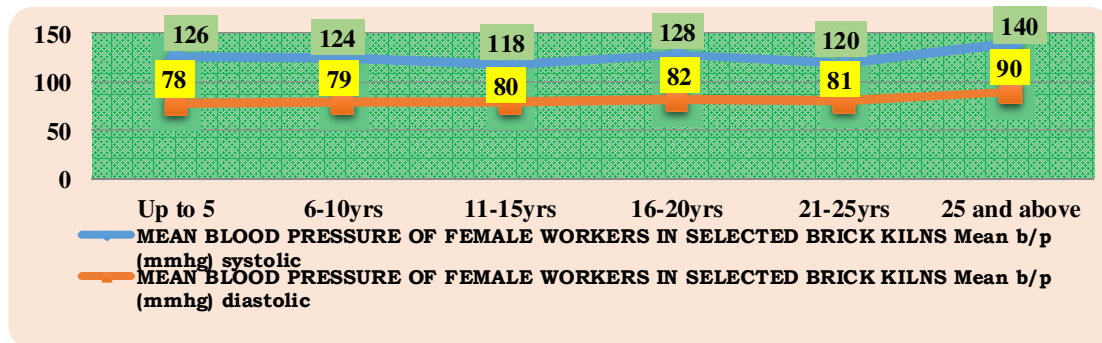
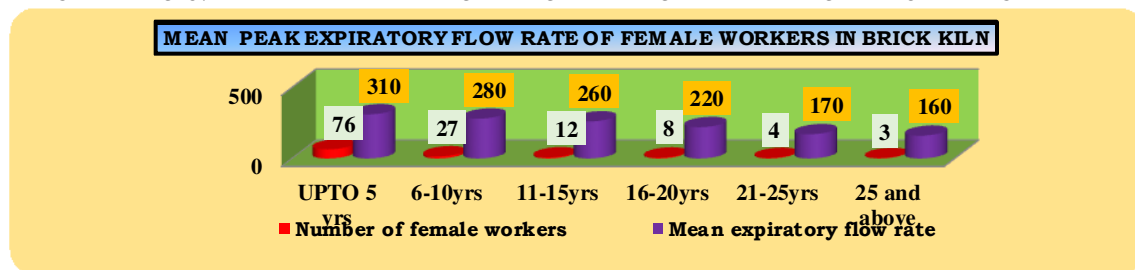


CHART NO-5: MEAN PEAK EXPIRATORY FLOW RATE OF FEMALE WORKERS IN BRICK KILN



Discussion

Female workers were present in two sections mixing and molding and loading and unloading. On basis of the result of socioeconomic condition of female workers it can be concluded that female workers show poor social and economic condition. 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. Family size of the female workers is large and many females have more than two children. Reasons given by the female for working in brick kiln is mostly due to poverty and illiteracy. Female workers get money according to the bricks they mold or load and unload. A molder female worker molds 1000-1200 bricks per day. Female worker carry 12-14 bricks on her head. A female worker carries 1500 bricks per day [3]. Due to less sleep and continuous and 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 etc.

Emissions from brick manufacturing unit shows particulate matter as a result of raw material grinding and screening process and harmful gases emitted from fuel combustion in brick kiln. Female workers live in the same environment with their families and exposed to all these harmful substances. Study of the particulate matter and gases revealed that it is above the level of air quality standards and is dangerous for health. Female workers work in hot environment and sweat profusely hence their body temperature is always below the normal range in work time.

Body mass index of most of the female workers are low due to lack of rest and improper diet. The pulse rate is also seen increasing as the work exposure period of the female workers increases. Peak flow expiratory flow rate of most of the female workers are below 350 indicating obstruction in breathing. Recovery heart beat of female workers were more than the normal indicating stressed condition[2]. Most of the female workers could not carry out the havards modified step test for more than one minute indicating very low fitness level.

Conclusion

From the study it can be concluded that health of female workers is affected badly. Study of workplace environment showed presence of all the parameter above the alarming levels. Particulate matter 2.5 has capacity to enter the alveoli level and cause severe harm to respiratory system. Female workers work in polluted air with toxic fumes and dust particles giving rise to many problems like asthma, allergies, and cough. They receive no medical facilities and amenities and no precautionary measures are practiced by workers. Physical fitness study showed that female workers have low fitness level. All the stressful condition, restless work, brick kiln environment, addiction, domestic pressure affects the health of female workers badly. There is a strong need for certain regulation in unorganized sector especially for female workers.

Recommendation

- Pregnant females should be given proper maternity benefit
- Labor department should come forward for the welfare of female workers in brick kiln.
- Special group should be appointed for health check up and proper counseling of female workers in brick kiln.
- There is a need to provide adequate housing facilities at the brick kilns.
- Worker friendly technology can be introduced to reduce the hardships associated with brick work.

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