ORIGINAL RESEARCH

Health status of the brick field workers in rural Maharashtra

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ABSTRACT

Background- India is the second largest producer of clay fired bricks of global production, accounting for more than 15% of global production¹. Brick field workers generally perform rigorous hand intensive jobs for a sustained period of time& are forced to carry various amounts of load during their work due to which they may suffer from musculoskeletal disorders & other occupational health problems². Brick field industries in the rural area of Maharashtra are expanding rapidly as the bricks are the primary construction material in Maharashtra; hence demand for the bricks has been rising over the past decade. Brick industries use many different raw materials & produces many intermediate products & by-products, among these there are many substances which are potentially harmful to thehealth of brick field workers, hence this study was carried out toassess the health status of the brick field workers in rural Maharashtra. **Aim and Objectives**-

1. To study the socio-demographic profile of the brick field workers.

2. To study the health problems of the brick field workers.

Methodology-A cross-sectional study conducted from 1st November 2018 to 31st December 2018 in 108brick field workers who were available during the study from all the brick fields around 10 km area of Ambajogai (Maharashtra) town were selected for the study. **Results & Conclusion-In** this study socio-demographically predominant age group was 21 - 30 years (30.5%), majority were Male (55.56%), Married (86.12%), Muslim (60.2%) by Religion, educated up to Secondary& High school (44.5%) & belonged to Lower middle Socio-economic status. Majority of the study participants were involved in moulding (51.85%) type of work & Skin diseases (28%) were predominant among the other health problems. There was significant association between morbidity profile and duration of work.

Key words- Health, Brick field, workers, Rural, Maharashtra.

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INTRODUCTION

India is the second largest producer of clay fired bricks of global production, accounting for more than 15% of global production¹. Brick field workers generally perform rigorous hand intensive jobs for a sustained period of time& are forced to carry various amounts of load during their work due to which they may suffer from musculoskeletal disorders & other occupational health problems².

Brick industry is one of the oldest industries in India. Architectural masterpieces had been built in the past withbricks and stones. Almost all type of construction work requires bricks in it. Bricks are used in the construction of buildings, infrastructure, dams and houses³.Till today the production technology has not undergone much change. Bricks are prepared, processedand baked at the brick kiln in the open spacesusually by the side of river. Brick kilns provideemployment to nearly 12 million people

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indifferent sub occupations⁴.Indian brick industry is highly labour intensive. It provides employment opportunities not only to the local workers but also to the migrant workers⁵.

As per the Economic Survey of 2007-08, out of 440 million workers in India, 93% of the workers are in the unorganized sector. The contributions made by the unorganized sector to the national income are very substantial as compared with that of the organized sector. A subcommittee of the National Commission for Enterprises in the Unorganized Sector in 2012 estimated that the contribution of unorganized sector to Gross Domestic Product is about 53.9%. Brick kiln industry is also an example of unorganised sector⁶. Brickfield industry is one of the more hazardous and risky occupations in terms of safety and health. Workers in the brickfield industry work under tough conditions to perform the desired task⁷.

Workers are one of the pillars of each and every industry. Needless to mention that a well-clad, well-

fed and satisfied pleased worker is a plus point to any industry. So, the owners of the industries need to pay attention towards the development of the workers engaged in the industries⁸. Occupational health is defined by the Internationallabour Organization (ILO) and the WHO, as 'the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations (Koh and Jeyaratnam, 2001)⁹.

No doubt brick kilns are an unsafe and hazardous workplace. The nature of the work exposes the workers to a dangerous environment and working conditions. Dust can lead to pulmonary diseases (e.g. asthma, wheezing) as well as silicosis. The brick kilns emit toxic fumes containing suspended particulate matter rich in carbon and containing a high concentration of carbon monoxides, as well as 8.8 per cent nitrogen oxide and oxides of sulphur (28.8 per cent) that is harmful to eyes, lungs and throat¹⁰. India is the second largest producer of bricks after China¹¹.



Little or no PPE is used to mitigate from dust or toxic gases and vapours present in the kilns. These toxicants can irritate the skin and mucous membranes, as well as the lungs. Providing proper PPE would not only help workers initial comfort but prevent the accumulation of toxicants in the body leading to chronic effects¹².

NEED FOR THE STUDY

In rural India where large number of brick field workers working in unorganised sector on daily wages and in adverse working environment which adversely affects the health status as well as the financial condition of the brick field workers. With this regard, it was thought of importance to study the health status of the brick field workers in Rural Maharashtra with the objectives to study the health problems and sociodemographic factors of the brick field workers.

MATERIALS AND METHODOLOGY

1. Study design: A cross-sectional study.

- 2. Study setting: The study was carried out among the brick fields functioning around 10 km area of Ambajogai(Maharashtra) town.
- **3. Study period**: 1st November 2018 to 31st December 2018.
- **4. Ethical considerations** Ethical committee approval was obtained from the Institutional ethical committee prior to the start of the study.
- **5. Inclusion criteria**: All brick field workers who were available during the survey and those who were given consent to participate in the study.
- 6. Exclusion criteria: Those workers who were not willing to participate in the study and those who were family members of the workers and not working in the brick fields.
- 7. Sampling Technique and Sample Size: The study was carried out among all brick field workers working in thebrick fields functioning around 10 km area of Ambajogai (Maharashtra) town. Samples were selected for the study by convenient sampling ¹¹ and inclusion exclusion criteria, so finally**108** samples were interviewed in this study.
- 8. Conduct of the Study:
- Selection of the brick fields: All brick fields around 10 km area of Ambajogai (Maharashtra) town were selected for the study by convenient sampling ¹¹.

- Selection of brick field workers: All brick field workers who were available during the study period from all the brick fields functioning around 10 km area of Ambajogai (Maharashtra) town were selected for the study by convenient sampling ¹¹ and inclusion exclusion criteria.
- **Consent of study participants:** Study participants were informed about the objective and purpose of the study. Those who were willing to participate in the study, their written informed consents were taken and enrolled in the study.
- **Data collection:** The objective and purpose of the study was explained to the respective study participant.

Face to face interview was taken with pre-designed and pre-tested questionnaire which includes sociodemographic factors and the health problems. Interview was conducted with the help of interns, junior residents and social worker.

- **Data compilation:** Collected data was entered into Microsoft-Excel 2010 worksheets and coded appropriately.
- **Data analysis:** Data was analyzed using Microsoft Excel 2010, Open EPI-Info Version 3.01 updated n 2013/04/06. To describe the data appropriately frequencies, percentages & chisquare test were used.

SN	Socio-dem	Percentage (%)			
	Age Group (years)	<20	21.3		
1.		21-30	30.5		
		31-40	27.8		
		>40	20.4		
		Male	55.56		
2.	Sex	Female	44.44		
		Married	86.12		
3.	Marital Status	Unmarried	13.88		
	Religion	Hindu	35.2		
4.		Muslim	60.2		
		Buddhist	4.6		
		Illiterate	36.1		
5.	Education	Primary	19.4		
		Secondary & High school	44.5		
	Socio-economic	Middle Class	6.48		
6.	* Status	Lower Middle Class	69.43		
		Lower Class	24.09		
* Modified B.G. Prasad Classification ¹³					

As per **Table-1** most of the Study participants were from the age gp of 21 - 30 years (30.5%), majority were Male (55.56%), Married (86.12%), Muslim (60.2%) by Religion, educated up to Secondary& High school (44.5%) & belonged to Lower middle Socio-economic status.

OBSERVATIONS AND RESULTS

Table-1. Socio-Demographic Profile of the brick field workers.

Table-2. Type of Work done by brick field workers.

TYPE OF WORK	FREQUENCY	%
	(N=108)	
Loading & Unloading	27	25.00
Moulding	56	51.85
Baking	14	12.96
Driver	6	5.55
Security Guard	5	4.62

In **Table-2**most of the study participants were involved in moulding (51.85%) followed by loading & unloading (25%) type of work.





Figure-1. Shows Skin diseases(28%) predominantly present in brick field workers followed by Musculoskeletal disorders (24%).

Table-3. Association between Morbidity Profile& Duration of work (Years).

MORBIDITY	DURATI WORK(
PROFILE	≤6	>6	
RESPIRATORY	14(25.45%)	41(74.54%)	
GIT	11(47.82%)	12(12%)	Calculated X ² =13.11,
EYE	11(23.4%)	36(76.59%)	DF=5,
SKIN	12(15%)	68(85%)	Tabulated X ² 0.05 =11.07
FRACTURE	2(25%)	6(75%)	
MUSCULO- SKELELON	11(16.17%)	57(83.82%)	

In **Table-3X**²_{calculated} > X²_{Tabular}when **significance level** (α) is considered to be **0.05**, hence there was significant association between morbidity profile and duration of work. In other words, as the duration of work increases, health problems have been found to increase as well.

DISSCUSSION

In this study Table-1 shows Socio-demographic of the brick field workers profile which includespredominant age group of 21 - 30 years (30.5%), majority were Male (55.56%), Married (86.12%), Muslim (60.2%) by Religion, educated up to Secondary& High school (44.5%) & belonged to middle Socio-economic Lower status. Study conducted by Vikrant et al¹showed that predominant age group of 20-30 (42%), majority workers were female,80% working population was married, majority of the workers were illiterate (90%). Manish A Prasad et al³ study showed that majority workers (82%) age was <50 years, majority were male, 95% were literate. Mayuree Das⁵ found in her study that most of the study participants from the study were from 30-39 years, 62% were illiterate. Navya CJ et al⁶, showed that gender wise there was no difference, mean age of the study participants was 29±11 years, 77% were married & 59% were illiterate.

Table-2 highlighted the type of work that was done by the brick field workers. Brick field workers engaged in loading & unloading, moulding, baking, driving, security. Among all these majority workers are involved in moulding.**Banibrata Das²** found that majority workers were involved in spading for mud collection (98%) followed by carrying bricks (95%), moulding (87%). **Mayuree Das⁵** found in her study that most of the study participants were involved in preparation of raw bricks (43.3%) followed by shifting of sundried bricks for staking in kilns (27.8%).

Figure-1 shows morbidity profile of the brick field workers. In this study morbidity profile includes diseases/illness related to respiration, GIT, eye, fracture & musculoskeletal.

Musculoskeletal problems like joint pain, bodyache, backache (58.7%) was the commonest morbidity (**Vikrant et al**¹). Most Common morbidities identified were musculoskeletal pain (48%), underweight (31%), respiratory diseases (27%), skin diseases (12%), eye complaints (8%) and work place injuries (5%) (**Navya CJ et al**⁶). As per **Sajan Das et al**⁹ highfrequency of respiratory problem, gastrointestinal illnesses, eye and ear problem as well as havingsome site injuries during work, more commonly in legs and hands were observed in the brick kilnworkers and sometime more than that.

Table-3shows significant association between Morbidity Profile& Duration of work (Years). Manish A Prasad et al^3 in their study found that musculoskeletal health problems in less than 10 years of work were reported by 14% workers and in more than 10 years of work was reported by 44% participants. Weakness was reported by 6 workers in less than 10 years of work and 28% workers reported to have weakness in more than 10 years of work.Navya CJ et al⁶ found in their study that there was no statistically significant difference in he mean duration of work among those with

musculoskeletalmorbidity. The same was found betweenduration of work and respiratory morbidityand the PEFR values.

CONCLUSION

The study population predominantly comprised individuals from the young to middle-aged age group, with a majority identifying as followers of the Muslim religion. Approximately one-third of the brick workers were illiterate. Socioeconomically, most participants belonged to the lower-middle and lower classes. In addition to these demographic and socioeconomic characteristics, brick workers commonly suffered from a range of health issues, including respiratory conditions, dermatological (skin) disorders, ocular (eye) problems, and musculoskeletal complaints. There was significant association between morbidity profile and duration of work in years.

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