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Title- A study to assess occupational health hazards among brick factory workers in Rahata Taluka.

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ABSTRACT

Background of study: The industry follows a very primitive and informal procedure in the field of technology, recruitment of workers, wage payment systems, and daily working conditions. In India, brick making is typically a manual process. It is one of the air and land polluting industries in the small-scale sector as per the Central Pollution Control Board (CPCB). Brick kilns have one of the most backward working environments in India that cause respiratory, gastrointestinal, psychosocial, dermatological, and musculoskeletal scatters. These hazards in the working environment are due to the high ambient temperature as well as hazards associated with manual load lifting. The vulnerable postures the workers are engaged in for long periods and the raw materials used, further increase the risk of injury. Some research findings in India suggested that occupational health hazards are most common among brick factory workers which included respiratory problems, skin problems, vision problems, musculoskeletal problems, hearing problems. Early identification of these hazards will be useful for prevention, early treatment and curative treatment of brick factory workers.

Objectives: 1. To assess the occupational health hazards among brick factory workers in Rahata taluka. 2.To find out association between occupational health hazards among brick factory workers with their selected demographic variables.

Material and methods: A quantitative approach was adopted for the current research study. A descriptive study design with survey approach is used to assess occupational health hazards. A total of 100 brick factory workers were selected as samples by non-probability purposive sampling technique. This study was conducted in the selected brick factories among area of Rahata taluka. The demographic variables were assessed by structured questionnaire and occupational health hazards were assessed by using a structured checklist. The results were analysed by descriptive and inferential statistics (frequency, percentage, chi square analysis).

Results: The results concluded that among the brick factory workers in Rahata taluka, skin problems were identified as the most common occupational health hazards as they accounted for about (53%) out of which skin infections were in majority about (14%), followed by eye problems were found about (51%) with majority of workers having far sightedness about (18%). With regards to musculoskeletal problems, they were found about (41%) in brick factory workers, out of which majority (18%) were faced nerve and muscle injury followed by gastro intestinal problems about (38%) out of which majority (10%) were having anorexia. Ear problems were found about (24%) which included majority (12%) with hearing impairment followed by respiratory problems (22%) with majority of workers having (9%) breathing difficulty followed by nervous system problems (7%) out of which majority (4%) of workers were having complaints of change in ability to sense movements. The study findings also concluded that there is no any significant association between occupational health hazards and selected demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

Key words: Assess, Occupational health hazards, Brick factory workers.

I Introduction

Occupational hazards are risks associated with working in specific occupations. The Occupational Safety and Health Administration (OSHA) describes five categories of occupational hazards: physical safety hazards, chemical hazards, biological hazards, physical hazards, and ergonomic risk factors. Physical safety hazards include anything that could lead to injury in a workplace accident. This could be slipping hazards, the operation of machinery, electrical hazards, or any other potentially dangerous condition that could exist in a workplace.[1]

Major hazards posed to brick kiln workers are chemical, physical, biological, psychosocial and ergonomic. Chemical hazards include exposure to brick dust, silica, carbon monoxide (CO), sulphur dioxide (SO_2), fluoride compounds and nitrogen oxides (NO_X). The workers are also exposed to burnt mud dust mixed with coal and cooked brick. Physical hazards include heat stress and excessive exposure to noise while working in the furnace.[2]

The occupational accidents in industries are not researched in the country. There are very few reports from the Compensation Office regarding occupational accidents in the bricks manufacturing industries in the country. Some of the major causes of occupational accidents in bricks manufacturing industries like mechanical and physical hazards are due to the use of different machines during production. [3]

A cross sectional study was conducted by Shaikh S, among the brick kiln workers in Larkana and Dadu districts, Sindh, Pakistan. A total of 340 adult workers were assessed for lung diseases were assessed using translated version of the American Thoracic Society Division of Lung Disease questionnaire. The study findings revealed that 22.4% workers had chronic cough while 21.2% reported chronic phlegm. 13.8% had two or more attacks of shortness of breath with wheezing. 17.1% workers were suffering from Chronic Bronchitis while 8.2% reported physician diagnosed asthma. Amongst the non-smoking workers 8.9% had Chronic Bronchitis. A high frequency of respiratory symptoms and illnesses was observed among brick kiln workers. [4]

I.1 Statement of problem

"A study to assess occupational health hazards among brick factory workers in Rahata Taluka."

I.2 Objectives

1. To assess the occupational health hazards among brick factory workers in Rahata taluka".
2. To find out association between occupational health hazards among brick factory workers with their selected demographic variables.

II Methodology

II.1 Research design and approach

A descriptive study design with survey approach was used for current study.

II.2 Setting of the study

The study was conducted in the selected brick factory in selected area of Rahata taluka.

II.3 Sample

In this study, sample consisted of workers of brick factory in Rahata taluka who meet the inclusion criteria and willing to participate in this study.

II.4 Sample size

In this current study a total of 100 brick factory workers were selected as samples.

II.5 Sampling technique

A Non-probability purposive sampling technique was used for the present study.

II.6 Sampling Procedure

Samples were screened for eligibility of inclusion and exclusion criteria. Brick factory workers eligible and willing to participate were included in the study.

II.7 Inclusion and Exclusion criteria

Inclusion criteria: Brick factory workers who are:

- Willing to participate for study.
- More than 23 years of age.
- Working in brick factory more than 5 years
- Able to understand, speak or read Marathi, Hindi or English.
- Willing to provide written consent and available during study period.

Exclusion criteria: Brick factory workers who are:

- Below 23 years of age group.
- Already having occupational health hazard
- Not willing to participate for the study
- Not available during the data collection period.

II.8 Tools and techniques

Interview method was used to collect the data from the participants, which consists of following sections;

Section A: - Demographic variables of brick factory workers including age, gender, religion, education, marital status, residence, monthly income, type of family, any substance abuse, any other associated illness.

Section B: - Structured checklist to assess occupational health hazards such as respiratory problems, skin problems, musculoskeletal problems, eye problems, ear problems and nervous system problems.

II. 9 Data collection procedure

Ethical aspects

a) **Ethical clearance:** Proposal was presented before Institutional Ethics Committee of PIMS(DU), Loni and ethical clearance was obtained.
b) **Permission from concerned authority:** Written permission was obtained from Taluka Health Officer of Rahata Taluka.
c) **Informed written consent:** The study participants were contacted on one-on-one basis and explanation regarding study objectives, confidentiality of their data, their willingness to participate and right to withdraw from the study were provided to them. Informed written consent was obtained from participants of the study.

Data collection: After self-introduction and informed written consent the data was collected from the participants using interview method.

II.10 Data Analysis

Data was coded in the Microsoft excel sheet. Descriptive and inferential statistics were used to analyse the data according to objectives. The demographic variables and occupational health hazards were analysed by using descriptive statistics (frequency and percentage). The association of occupational health hazards with selected demographic variables were analysed by using inferential statistics (chi square analysis).

III Results

III.1 Assessment of socio-demographic characteristics of the study participants

The demographic findings revealed that maximum (42%) of the workers belongs age group of 23 to 30 years, followed by (28%) which belongs to the age group of 31 to 40 years and about (18%) belongs to 41-50 years of age, few of them (12%) belongs to the age group of 51 to 60 years. Distribution of the subject as per gender which shows majority of workers about (68%) were male and (32%) were female. Distribution of the subject as per education predicts that a maximum of (44%) workers are having primary education followed by (36%) who are illiterate and a few about (20%) are having secondary education. None of the workers are having any degree and diploma. Distribution of the subject as per religion predicts that majority of (43%) workers were Hindu, (22%) workers were belonged to others religions, (20%) workers were Muslim and very few (15%) workers were

Christian. Distribution of the subject as per area of residence predicts that highest (69 %) of workers belongs to rural community and the remaining (31%) are from urban community. Distribution of the subject as per monthly income predicts that (40%) workers are having monthly income of Rs 5001 – 10,000, followed by (30%) of workers with monthly income less than Rs 5000 and (30%) are with monthly income between Rs 10,001- 15000/- . Distribution of the subject as per type of family predicts that majority (57%) workers belong to nuclear type of family, (25%) of them are from the joint type of family, and (18%) of belongs to extended type of family. Distribution of the subject as per marital status predicts that majority (65%) workers are married, (25%) are unmarried, very few (8%) of them are widows and (2%) are divorced. Distribution of the subject as per substance abuse predicts that (56%) workers are having substance abuse and (44%) of them are not using any substance abuse. Among (56%) workers who are having substance abuse, (40%) of them are having tobacco abuse, (30%) are having gutkha abuse, (21%) are having alcohol abuse, (15%) are abusing either cigarette, bidi or marijuana and (10%) are abusing other substances. Distribution of the subject as per any associated illness predicts that (67%) workers are not having any associated illness and (33%) are having associated illness.

III.2 Assessment of occupational health hazards among brick factory workers.

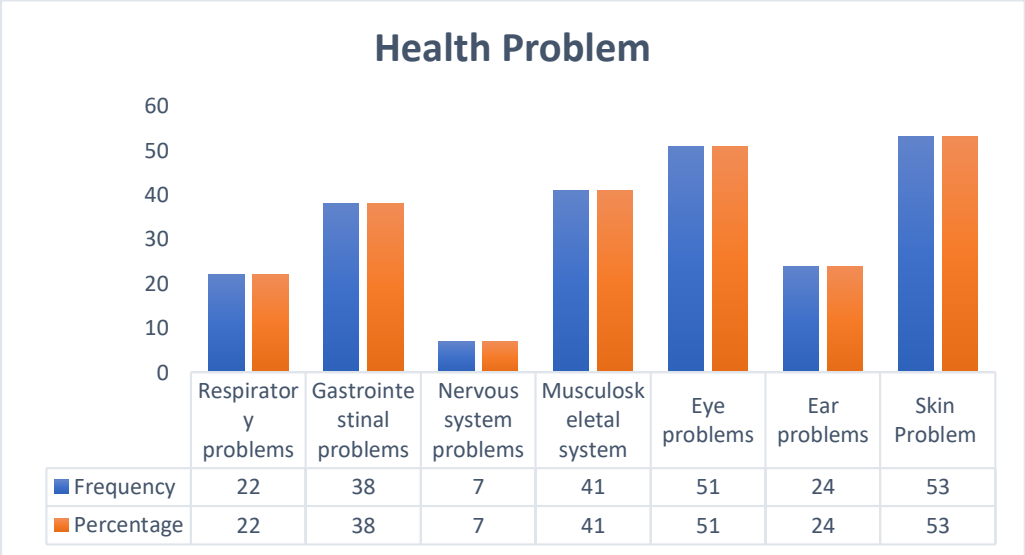

Fig:1. Occupational health hazards among brick factory workers

III.3 Association of occupational health hazards with selected demographic variables.

Table 1. Association of skin problems with selected demographic variables.

S N	SKIN PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	4.29	3	Not Significant
2	Gender	4.18	1	Significant
3	Education	7.39	3	Not Significant
4	Religion	1.39	3	Not Significant
5	Monthly income	8.29	2	Significant
6	Type of family	4.28	2	Not Significant
7	Marital status	3.12	3	Not Significant
8	Substance abuse	3.2	1	Not Significant
9	Residence	5.33	1	Significant

Above table 1 shows association between skin problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, education, religion, type of family, marital status, and substance abuse except gender, monthly income and residence of brick factory workers.

Table 2. Association of eye problems with selected demographic variables.

S N	EYE PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	3.48	3	Not Significant
2	Gender	4.5	1	Significant
3	Education	6.41	3	Not Significant
4	Religion	1.3	3	Not Significant
5	Monthly income	6.64	2	Significant
6	Type of family	4.91	2	Not Significant
7	Marital status	3.58	3	Not Significant
8	Substance abuse	2.72	1	Not Significant
9	Residence	6.51	1	Significant

Above table 2 shows association between eye problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, education, religion, type of family, marital status, and substance abuse except gender, monthly income and residence of brick factory workers.

Table 3. Association of musculoskeletal problems with selected demographic variables.

S N	MUSCULOSKELETAL PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	4.25	3	Not Significant
2	Gender	2.18	1	Not Significant
3	Education	3.14	3	Not Significant
4	Religion	2.33	3	Not Significant
5	Monthly income	2.49	2	Not Significant
6	Type of family	3.21	2	Not Significant
7	Marital status	5.21	3	Not Significant
8	Substance abuse	6.46	1	Significant
9	Residence	4.38	1	Significant

Above table 3 shows association between musculoskeletal problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

Table 4. Association of gastro intestinal problems with selected demographic variables.

S N	GASTRO INTESTINAL PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	3.84	3	Not Significant
2	Gender	2.33	1	Not Significant
3	Education	6.69	3	Not Significant
4	Religion	3.58	3	Not Significant
5	Monthly income	5.89	2	Not Significant
6	Type of family	6.55	2	Not Significant
7	Marital status	7.37	3	Not Significant
8	Substance abuse	4.33	1	Significant
9	Residence	3.29	1	Not Significant

Above table 4 shows association between gastro intestinal problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

Table 5. Association of ear problems with selected demographic variables.

S N	EAR PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	5.29	3	Not Significant
2	Gender	3.29	1	Not Significant
3	Education	6.58	3	Not Significant
4	Religion	1.1	3	Not Significant
5	Monthly income	3.19	2	Not Significant
6	Type of family	2.12	2	Not Significant
7	Marital status	2.19	3	Not Significant
8	Substance abuse	8.1	1	Significant
9	Residence	4.55	1	Significant

Above table 5 shows association between ear problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

Table 6. Association of respiratory problems with selected demographic variables.

S N	RESPIRATORY PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	5.1	3	Not Significant
2	Gender	3.15	1	Not Significant
3	Education	2.59	3	Not Significant
4	Religion	4.54	3	Not Significant
5	Monthly income	3.1	2	Not Significant
6	Type of family	2.89	2	Not Significant
7	Marital status	6.23	3	Not Significant
8	Substance abuse	5.48	1	Significant
9	Residence	4.53	1	Significant

Above table 6 shows association between respiratory problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

Table 7. Association of nervous system problems with selected demographic variables.

S N	NERVOUS SYSTEM PROBLEMS	CHI SUARE VALUE	DF	SIGNIFICANCE
1	Age	4.12	3	Not Significant
2	Gender	3.18	1	Not Significant
3	Education	5.52	3	Not Significant
4	Religion	2.46	3	Not Significant
5	Monthly income	3.18	2	Not Significant
6	Type of family	2.46	2	Not Significant
7	Marital status	3.12	3	Not Significant
8	Substance abuse	7.44	1	Significant
9	Residence	5.36	1	Significant

Above table 7 shows association between respiratory problems and selected demographic variables. It concludes that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers.

IV Discussion

IV.1 Findings related to demographic variables.

The demographic findings revealed that maximum (42%) of the workers belongs age group of 18 to 30 years, maximum (68%) workers were male, maximum 44% workers are having primary education, maximum (43%) workers were Hindu, maximum (69 %) of workers belongs to rural community , maximum (40%) workers are having monthly income of Rs 5001 – 10,000, maximum (57%) workers belong to nuclear type of family , maximum (65%) workers are married, maximum (56%) workers are having substance abuse out of which majority (40%) of them are having tobacco abuse, maximum (67%) workers are not having any associated illness. The above study findings were supported by Sobieh Saeed who conducted study of 120 brick factory workers.[5]

IV.2 Findings related to existing occupational health hazards.

The first objective of the study was to assess occupational health hazards among brick workers. The results concluded that among the brick factory workers in Rahata taluka, skin problems were identified as the most common occupational health hazards as they accounted for about (53%) out of which skin infections were in majority about (14%), followed by eye problems were found about (51%) with majority of workers having far sightedness about (18%). With regards to musculoskeletal problems, they were found about (41%) in brick factory workers, out of which majority (18%) were faced nerve and muscle injury followed by gastro intestinal problems about (38%) out of which majority (10%) were having anorexia. Ear problems were found about (24%) which included majority (12%) with hearing impairment followed by respiratory problems (22%) with majority of workers having (9%) breathing difficulty followed by nervous system problems (7%) out of which majority (4%) of workers were having complaints of change in ability to sense movements. The above study findings were supported by Shaikh S who conducted study on brick factory workers where study findings revealed that 22.4% workers had chronic cough while 21.2% reported chronic phlegm. 13.8% had two or more attacks of shortness of breath with wheezing. 17.1% workers were suffering from Chronic Bronchitis while 8.2% reported physician diagnosed asthma. Amongst the non-smoking workers 8.9% had Chronic Bronchitis. [6]

IV.3 Findings related to association of occupational health hazards with selected demographic variables.

The association between occupational health hazards and selected demographic variables concluded that there is no any significant association between skin problems and demographic variables such as age, gender, education, religion, monthly income, type of family and marital status except substance abuse and residence of brick factory workers. The above study findings were supported by Basma [7] and Nijam J [8] concluding no any significant association of occupational health hazards with selected demographic variables.

V Conclusion

The study findings have shown that skin problems were identified as the most common occupational health hazards among brick factory workers with other hazards like eye problems, musculoskeletal problems, gastrointestinal problems, ear problems, respiratory problems and nervous system problems. It was also concluded that there was no any significant association of occupational health hazards with selected demographic variables except substance abuse and residence of brick factory workers.

Declaration by Authors

Ethical approval: The present study was approved by the Institutional Ethics Committee of Smt. Sindhutai Eknathrao Vikhe Patil College of Nursing of Pravara Institute of Medical Sciences (DU), Loni. [Ref. No. PIMS/SSEVPCON/2023/03)]

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