

OCCUPATIONAL HEALTH HAZARDS AND AWARENESS OF OCCUPATIONAL SAFETY AMONG WORKERS OF TEXTILE DYEING INDUSTRIES IN JAIPUR, INDIA

Megha Bansal¹, Rajesh Kumar Yadav^{2*}

¹Department of Life Sciences, Suresh GyanVihar University, Jaipur

^{2*}Department of Environmental, Science S.S. Jain Subodh P.G. College Jaipur (Raj.)

*Corresponding Author Email: subodhproject@yahoo.com

ABSTRACT

The objective of the study was to assess the health risk factors and awareness of Occupational safety and health of workers in textile dyeing industry of Jaipur. A pretested questionnaire was used to evaluate the health problems and awareness of occupational safety and health among workers. The majority of these workers were suffering from eye irritation, back pain, allergies, general weakness, with most workers having three to five of these health problems. Back pain was found in 20%, 14.4%, 40.4%, of the workers in the age group of 20-35, 36-50, 51-65 years respectively, during the study period. Occupational contact dermatitis reaction was observed in 51.1%, 26.5%, 51.0%, of the workers in the age group of 20-35, 36-50, 51-65 years respectively. A large number of diseases in different age groups are an indication that this industry exposes workers to many health hazards and lack of awareness.

Keywords: Health Risks, awareness, workers, dyes

INTRODUCTION

The textile industry is one of the rapidly growing sectors of Pink City's financial system as this industry provides employment to a large number of people in Rajasthan [1]. Jaipur, the State capital that has a population of more than two million people and most of the textile industries are concentrated in Sanganer. Their textile industries are estimated to be around 575 block and screen-printing units in Jaipur and near about 10,000 workers are working in this sector that get exposed to a large number of chemicals and become the victims of different types of diseases and health problems.

The origin of synthetic materials used in the textile industry has produced many new types of dyes have been developed and put into regular use. In textile industry a large number of chemicals are used such as caustic soda, hydrogen peroxide, formic acid, sodium nitrate, azo dyes, direct dyes, reactive dyes and mordents. The exposure of workers to different types of chemicals causes different types of diseases like skin allergies, respiratory diseases and musculoskeletal disorders. Skin allergies i.e., occupational dermatoses contribute a large number of occupational diseases and could even

go beyond all other industrial diseases put together [3]. Other organs such as the eyes, lungs, liver and urinary bladder may also be caught up [4]. The general factors that affect the development of contact dermatitis are existing dermatoses, pressure, friction, sweating and prolonged immersion in water [5]. Genetic influences also play an important role [6]. Respiratory diseases may cause dry cough of chronic or non-chronic nature, asthma and other respiratory symptoms.

Globally, Musculo Skeletal Diseases (MSD) are the largest single cause of work-related illness, accounting for over 33% of all newly reported occupational illnesses in the general population and 77% in construction workers. MSD is also the largest cause of sick absenteeism, days of work lost and disability. It affects productivity at work, causes increased economic burden due to costs of workers' compensation, healthcare and insurance [7]. The risks of MSD can increase with low job satisfaction, high job demands, job stress and lack of support from peers and supervisors. Further, the workers are not aware of health and safety is poor management that does not promote OHS in Textile industry (8).

A number of studies have been carried out all over the world to enumerate and evaluate the health effects workers working in the dyeing and printing industry. However, such studies carried out in other parts of the world as well in Jaipur but this is the first study carried out in Jaipur city that involved around 500 workers involved and they all were simultaneously studied for the respiratory, skin and musculoskeletal disorders. Hence, this study was initiated to explore occupational health status of the exposed workers in Sanganer, Jaipur, Rajasthan.

MATERIALS AND METHODS

Study Area

Jaipur is situated in the eastern part of Rajasthan. Jaipur is located at 26°55'N 75°49'E (26.92°N 75.82°E). Besides other products Jaipur is famous for cloth dyeing industry. The study area selected was textile cluster units of Jaipur region. These clusters units at Jaipur use lot of water during dye processing and then the untreated waste water from these units is directly discharged into the small nalla going from their houses which are then ultimately drained into Dravyavati River.

Study groups

Cross sectional study design was employed in the study. Around 35 units located in Jaipur city were randomly selected for the study. All the 437 male workers and 63 female subjects employed in dyeing units were included under the exposed group. Those who did not give consent for the study in the exposed group were excluded.

A total of 437 male workers and 63 female workers were drawn from various cloths dyeing units of Jaipur. The questionnaire which was a modified version of earlier studies (9-10) was as:

- a). Personal details are i.e age, gender, job tenure, daily working hours, marital status, number of children, educational level, smoker or non smoker and medical background.
- b). The second part of the questionnaire was subdivided into different types of diseases viz., respiratory disease, musculoskeletal diseases, physical disorders, and general disease. The target group was the workers of the age between 20–65 years and the experimental subjects were

divided into three groups according to their age (i.e., 20-35, 36-50, 51-65 years).

A complete history of the workers was recorded with respect to the duration and nature of occupation, respiratory symptoms, smoking and family on a pre structured performa.

Health Hazards

The health hazards of the workers in the selected small scale industries were evaluated with the help of Medical evaluation schedule developed by OSHA with slight modifications wherever necessary. The questionnaire is requiring signature covering age, occupational carrier, working days in a week and daily working hours were filled personally by translating the questionnaire in the local language (Hindi). The present illness, general subjective symptoms, musculoskeletal symptoms, respiratory problems and injuries were also included in the questionnaire. The participants were asked about symptoms of illness during the last six months.

RESULTS

The data described in Fig.1 illustrate that the majority (47%) of workers were middle aged (35-50), while one-fourth (26%) were young (35-50 years) and (27%) of the workers belonged to old age (50- 65 years).

Gender

The respondents were asked about their gender and responses are offered in Table 4 which shows that a vast majority (87%) of the respondents were male and only 13% were female workers. This shows that the dye industry prefers male workers rather than female (Fig. 2).

Smoking Habit

The respondents were asked to tell about the smoking habit and their answers are presented in Table 1, which specifies that majority (70.29%) of the respondents smoke a cigarette and only (29.71%) of the respondents do not smoke cigarette. Among those who smoke, 91.86 percent reported that they smoke up to 2 cigarettes daily and half of the respondents were smoking 5 cigarettes daily. The respondents who smoke were further asked where they used to smoke, 93.50 percent of them argued that they smoke at their work place and 6.50 percent smokes in Canteen of the industry.

Physical health of the workers

The respondents were asked about their physical health which disclose that about one-fourth (54.29%) of the respondents were suffered from chronic diseases and 30.29 percent were hospitalized.

Disease and their frequency

The respondents were asked about the frequency of suffering from different diseases from the last six months and the responses are presented in Figure 3-6. The highest prevalence of different physical and ergonomic diseases was found in the workers having the age group of 50-65 years followed by the age group of 36-50 years (Figure 3). Back pain was found in 20%, 14.4%, 40.4%, of the workers in the age group of 20-35, 36-50, 51-65 years respectively, during the study period (Figure 4). Shortness of breath was found in 28.9%, 27.7%, 38.3%, of the workers in the age group of 20-35, 36-50, 51-65 years respectively. Coughing was found in 8.9%, 7.2%, 29.7%, of the workers in the age group of 20-35, 36-50, 51-65 years respectively (Figure 6).

OHS Measure and Awareness

The respondents were asked about the awareness of occupational health and safety and the responses are presented in Fig 7, which shows that majority (56%) of the respondents do not have awareness about occupational health and safety and one-third (32%) of the respondents reported their awareness to great extent. However, only 12 percent of the respondents are aware of occupational health and safety to great extent (Table. 2).

About 82.9% of the managers reported that they included the basic concept of OHS protection in the induction courses of new employees. 100% workers reported that they had no vaccination of workers against infectious Diseases conducted during the last 12 months and no medical checkup was carried out before their recruitment in this industry. A simple majority (57.5%) had no effective inspection system and the same number of the managers had no formal system. More than one-third (37.5%) of managers described that they had adequate numbers of competent personnel to carry out OHS programme. The same number of

managers also had the facilities of the ambulance in case of emergency. All managers reported that their enterprises have the waste treatment plant.

DISCUSSION

The present study revealed that the workers in the dyeing industry of Jaipur are exposed to an increasing number of chemicals and occupational hazards over the years. One of the major causes of concern is occupational dermatoses. Most of the time it was reported by workers working in Jaipur dyeing industry those other vital organs such as the eyes, lungs, liver and urinary bladder are also involved. The reason for occupational dermatoses among the workers of cloth dyeing industry in Jaipur is the constant immersion of hands for prolonged periods in water. Pressure, friction, sweating and also plays an important role for the development of dermatoses among the workers.

It was observed that the workers in this industry are also exposed to various types of respiratory symptoms like asthma, chronic bronchitis, cough and chest pain. The presence of organic dyes produced chest tightness, chest pain, angina, that kept the workers away from the work most of the time.

Organic dyes exposure produces symptoms like chest tightness mostly on resuming work after an absence, altered pulmonary functions findings, etc. The process of making clothes involves many stages and the whole process is labor intensive which can be broadly divided into printing and dyeing of fabrics. The fabric is stretched along a long table and the selected design is printed using a screen which has the selected motif engraved in it during screen printing. However, this process exposes the workers to many types of ergonomic disorders that are mostly overlooked by the owners of the units and the workers who are engaged in this profession. The dye is applied on the screen at regular intervals without using any type of personnel protective equipment by the workers that aggravate the problems of the workers involved in the process. Depending upon the design requirements wax is melted on fabrics using either a block or a brush in batik printing. In the dyeing process, thick rope is used first and is dyed first and then rinsed in water and later sundried to complete the process.

The process of tying and dyeing is a manual procedure that directly exposes various workers of cloth dyeing industry of Jaipur to various dyes and chemicals used for bleaching, printing and finishing. The most common skin diseases, such as allergic contact dermatitis, irritant dermatitis and inflammation of mucous membranes, result from contact with dyes and chemicals, particularly acids, alkalies, oxidizing and reducing agents, detergents and solvents. In the present investigation, the prevalence of contact dermatitis in the 'tie and dye' industries of Jaipur has been reported by the workers was found to be very high as compared to other studies.

It was observed that all the family members including the children participated in the 'tie and dye' work that is done manually in the courtyard of small residential houses, with poor ventilation, light and working conditions using wood as a fuel. The solution for dyeing is prepared in one corner of the house and washing and rinsing is done in another. The drainage system is very poor, open and highly unhygienic in all the units that were under investigation.

The study revealed that dye workers suffered from ache in various parts of the body, especially in lower back, knees and upper extremities due to kneel, squatting and awkward working postures for longer periods of time. Furthermore, in order to see things clearly the workers have to take several harmful postures that render them to various types of muscular skeletal disorders. According to Wani and Jaiswal [9], severe discomforts or pain in the workers is due to heavy spinal loading and repetitive movement of the body parts over an extended period. The feeling of discomfort (pain) in different parts of the body among the workers may be due to their prolonged working hours and repetitiveness of the work without sufficient rest, which may lead to severe musculoskeletal disorders. Joshi et al. has obtained a 59.4% prevalence of MSD in their study on industrial workers in Delhi and have

recommended that due to the high prevalence of MSDs in workers, the condition needs urgent attention from the health and labor sectors [11].

Although all the workers strongly believe that there should be safe methods of to handle and dispose contaminated packaging in an ecofriendly manner, only 20% of the workers had been instructed on safe methods of handling dyes. The rest of the workers did not receive any instructions on handling of dyes, because in every unit only few people had been identified to prepare the dye solution. The different methods are utilized by the workers of cloth dyeing industry to remove the stains due to dyes on the hands and legs depend on the availability, ease of access, perception of workers for stain removal. Workers engaged in dyeing mostly used bleaching powder to remove irritants while dish washing powder and soap was used by workers engaged in screen printing, and water was used by hand printers and batik printers. This study clearly indicated that although workers had knowledge regarding the work-related hazards irrespective of the nature of the occupation they are engaged in, their attitudinal approach toward the betterment of the work environment is positive. Making workers aware of the occupational hazards and motivating them to use PPE while at work is the need of the hour.

CONCLUSION

The workers in cloth dyeing industry of Jaipur are exposed to different types of health hazards due to poor working conditions and lack of awareness among working community. There must be established policies binding the owners of cloth dyeing industry to keep conditions favorable for weaving. Most diseases and health problems found in carpet units can be avoided with proper precautions and care. Some protective equipment must be provided, e.g., face masks and first-aid facilities, to protect workers from the adverse effects environment. The owners, with the co-operation of the government, must also provide health insurance.

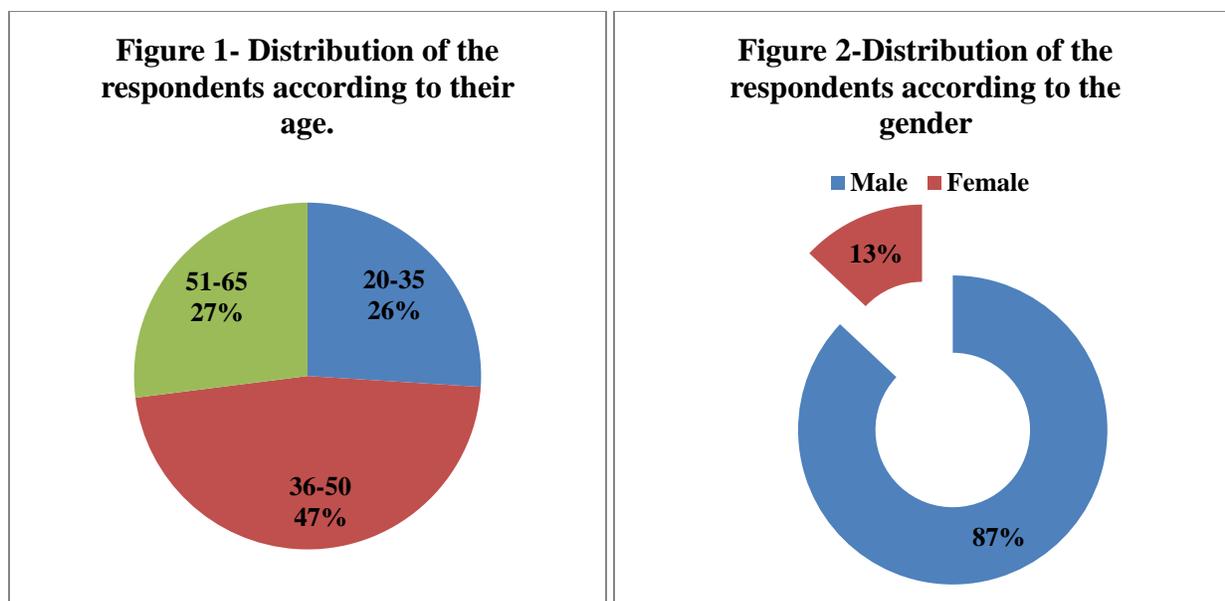


Table 2- Distribution and proportion of general information about OHS management

Statement	Yes		No	
	Frequency	%	frequency	%
Has any medical checkup of workers conducted during the last 12 months?	320	64	180	36
Has any Vaccination of workers against infectious Diseases conducted during the last 12 months?	0	0	500	100
Do you have SHE (Safety Health & Environment) Manger in your industry?	414	82.9	86	17.1
Has any medical checkup conducted at the time of recruitment/selection?	0	0	500	100
Do the OHS policy and arrangement for its implementation been communicated to all employees, contractors and other potentially affected groups?	209	41.8	291	58.2
Do you provide suitable information, instruction and training in PPE use and maintenance to your employees?	363	72.6	137	27.4
Are basic concepts of occupational health and safety protection included in the induction courses for new employees?	14	2.8	486	97.2
Do you have any waste treatment plant (solid, air, water) at your facility?	0	0	500	100

Figure 7-Awareness about the occupational health and safety

■ To great extent ■ To some exten ■ Not at all

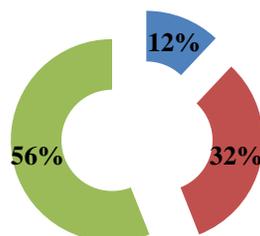
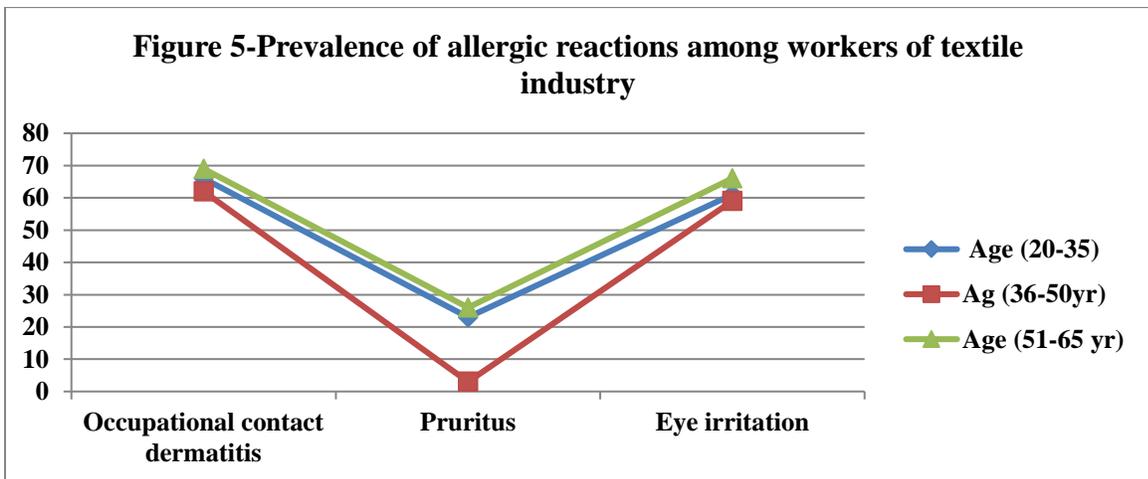
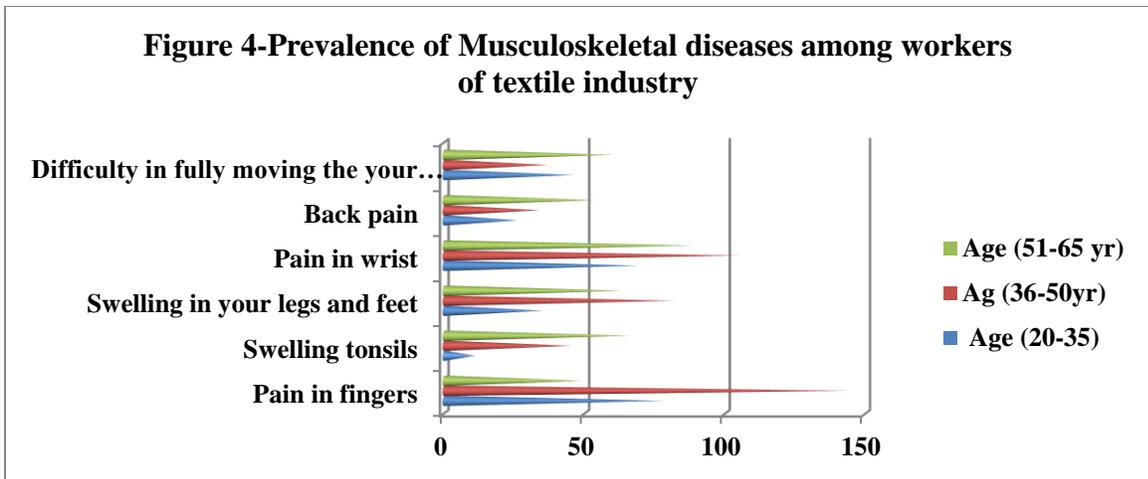
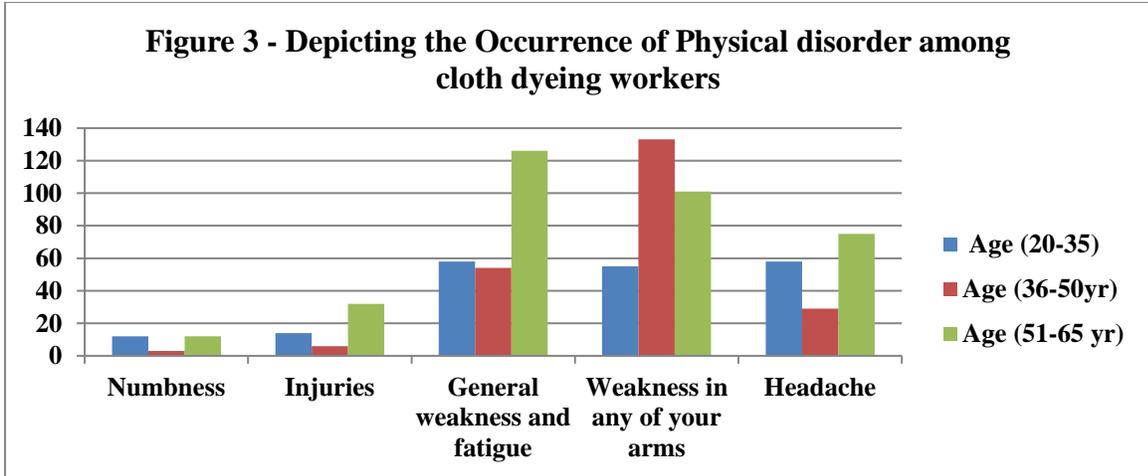
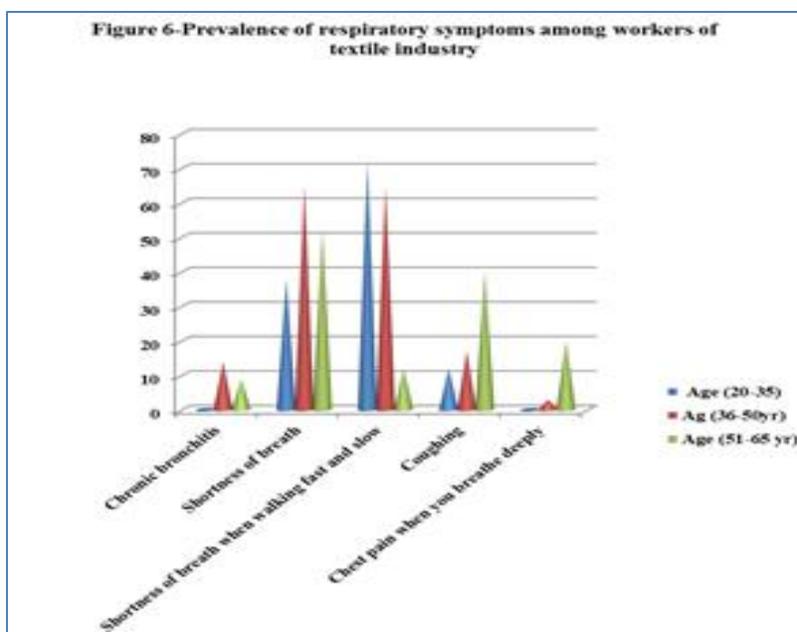


Table 1- Distribution of the respondents according to their smoking habits and frequency of smoke.

Smoking habit	Frequency	%
Yes	387	77.6
No	113	22.4
Total	500	100
If yes than how many cigarettes you take daily?		
Up to two (2)	355	91.86
> 3-5	22	5.7
>6-10	10	2.44
Total	387	100
Where do you smoke at your facility?		
At canteen	361	93.5
At the work place	26	6.5
Total	387	100





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