

# To identify hazards and risks (Health and safety) in the textile dyeing industry

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Received: 16.03.2017; Revised: 22.04.2017; Accepted: 07.05.2017

■ **ABSTRACT :** The present study was planned in order to identify hazards and risks (Health and safety) workers who are working in dyeing industry. Longer the duration of work more may be the effects of the dye on human body Since dyeing industries work with corrosive chemicals, reactive dyes, hazardous solvents and other toxic and substance, the long term contact and exposure affected people's health. Therefore there was a need to study the effects of the dyeing chemicals on the health of the place. This would create awareness about their safety and precaution to be taken during the operations. Such hazards when identified proper action could be carried out to illuminate the short comings and defects.

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■ **KEY WORDS:** Health hazards, Safety risk, Textile dyeing industry

■ **HOW TO CITE THIS PAPER :** Jabeen, Nazneen and Jabeen, Arushi (2017). To identify hazards and risks (Health and safety) in the textile dyeing industry. *Asian J. Home Sci.*, 12 (1) : 182-187, DOI: 10.15740/HAS/AJHS/12.1/182-187.

The study of the health hazard and safety risks in textile dyeing industry focuses, health and safety of the workers in India. The hazards and risk involved in the textile dyeing industry is often compared with other industries but least importance is given to textile dyeing industries. Most of accidents does not even reported to the legal authorities. The main reason the people are not aware of health hazards and safety risks is because of the fact that the majority workers are uneducated and senior management does not gives importance to promote health and safety in textile dyeing industry. The major hazards are physical, chemical, ergonomically and physiologically hazards along with these some of things which can create such health hazards are more working hours, improper ventilation. The RPN (Risk Priority Number) is calculated to find

out the actual hazards levels in the textile dyeing industry and FEA (Fire and Explosion Assessment) is done for the hazards with highest RPN No.

**Define health and safety? :**

Regulations and procedures intended to prevent accident or injury in workplaces or public environments. Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment. In the United States the term occupational health and safety is referred to as occupational health and

occupational and non-occupational safety and includes safety for activities outside work. Occupational safety and health can be important for moral, legal, and financial reasons. In common-law jurisdictions, employers have a common law duty (reflecting an underlying moral obligation) to take reasonable care for the safety of their employees, Statute law may build upon this to impose additional general duties, introduce specific duties and create government bodies with powers to regulate workplace safety issues: details of this will vary from jurisdiction to jurisdiction. Good OSH practices can also reduce employee injury and illness related costs, including medical care, sick leave and disability benefit costs.

**What is the difference between a hazard and risk?:**

A hazard is something that can cause harm, e.g. electricity, chemical, working up a ladder, noise, a keyboard, a bully at work, stress etc. A risk is the chance, high or low, that any hazard will actually cause somebody harm.

**The major health hazards and safety risks in the textile dyeing industry:**

Hazard is any substance or agent that can cause potential health effect. During textile processing the worker are exposed to various Health and Safety issues in the textile dyeing industry. Issues are classified into health and safety (Table A).

Table A : Classification of health and safety		
Sr. No.	Health hazards	Safety risks
1.	Physical issues	Materials and products
2.	Chemical issues	Equipment
3.	Biological issues	Human factors
4.	Ergonomic issues	Work organization
5.	Psychological issues	Environmental condition

**Health hazards safety risks :**

**Types of hazards (Fig. A) :**

*Physical hazards:*

Heat, cold, lighting, noise, visible ultra violet radiation, temperature, humidity and ionizing.

*Chemical and mineral hazards:*

Dust, vapours, fumes, gases, solvent, metal and their compounds.

*Biological hazards:*

Various, blood borne disease, sharps/needle sticks, bacteria, moulds in health care and other works.

*Mechanical hazards:*

Tripping hazards, traumatic injuries, housekeeping injuries, steps and fault of moving equipment's.

*Ergonomic hazards:*

Posture force (pushing/pulling), repetitions, vibration, pressure on the body, work organization (poorly designed work procedure and tasks) are work environment.

*Psycho-social hazards:*

Low/high work load demand, pace /work, little and no control over what work to do, no social support, relations harassment and discrimination or physical or mental treats.

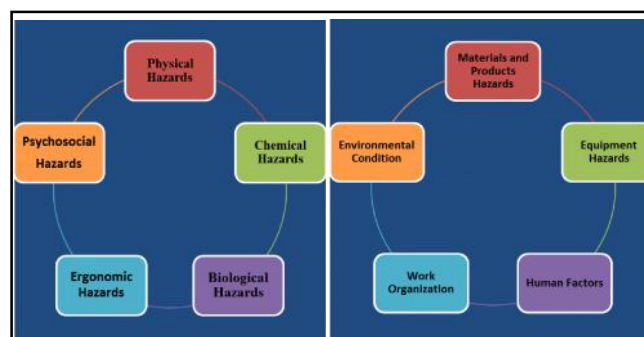


Fig. A : Types of hazards

**RESEARCH METHODS**

The primary data was collected by direct interview of the workers based on a questionnaire and observations and secondary data were based on the published reports, journals, projects and book. The questionnaire includes the question related to their anthropometric measurements, medical history, social and family back ground. In this study a sample survey was conducted instead of census survey. The response of the workers was recorded for further use.

In fact this is a type of sample survey. We had selected 6 industries from Faridabad, Delhi and Sahibabad out of other industries located around and at different places. All the collected data was tabulated suitably and the statistical comparison was also done by using computer programmes (mean, percentage and chi-

square). Finally the data was tabulated and statistical analysis was performed.

## ■ RESEARCH FINDINGS AND DISCUSSION

All the workers engaged in these industries were classified according to their age spanning 4 years difference and the number of workers identified involved in natural and synthetic dyeing. Out of fifty workers in each type of dyeing process only 22 workers were in the age of 18-22 years and 22 workers were in 48-70 years age groups. Rest of the workers were between 23-47 years of age. Joining at the early age had many reasons like they belonged to the poor family they were less educated, they wanted to earn for their families etc. Most of these industries did not provide training for this occupation neither they demanded the trained people.

Furthermore the workers interviewed had the small body status. Most of the workers were below 5'9" height. Among 47 per cent worker in natural dyeing and 42 per cent workers in synthetic dyeing industries. Maximum workers were of 5'9" in height 2 workers in natural and 31 workers in synthetic dyeing. Only 6 workers were above 5'9" in height in each type of dyeing processes. This reflected that they were not nourished from the childhood. Their poor health was also evident from their body mass as most of the workers employed weighed below 66 kg. Less numbers of workers were weighting 66-70 kg (39 in each dyeing process). Only 24 per cent workers in natural and 16 per cent workers in synthetic dyeing were in 71-75 weight categories.

Their education level 37 per cent in natural and synthetic dyeing were educated and they were only upto 12<sup>th</sup> standard except 4 workers who were graduates. Out of them 30 workers were high school and 46 were 8<sup>th</sup> class. This was one of the reason to find the opportunity to earn for living and join such occupations. The remaining 37 per cent and 47 per cent were totally illiterate.

In our society most of the people work in a particular preposition as guided by their caste. The Christians mostly avoid going to join such tasks like dyeing and same is the case with Sikhs, Muslims also want to do their own works but the Hindus mostly try to earn their livings by doing job in industries. In the dyeing industries 80 per cent and 86 per cent workers were Hindus in natural and synthetic dyeing. The remaining 8 per cent were Muslim, 9 per cent Sikhs, 3 per cent Christians and 12

per cent belonged to other caste. The Hindu workers are afraid of starting their own business hence were compelled to join these types of industries.

Many of these workers had their families and were married 79 per cent and 88 per cent in natural and synthetic dyeing. A 16 per cent and 10 per cent were unmarried and 5 per cent and 2 per cent were widower. So they had to support their families by earning from the place where ever they get a chance and were forced to remain there in spite of all odds. This reason applies on the workers of other industries also like tannery.

The work of dyeing mainly involves the workers migration from Bihar due to low earnings in their states and other types of exploitation. In dyeing industries under this study also employs most of the workers are from Bihar (92% and 87%) only 5 per cent and 6 per cent were from Faridabad and Sahibabad. The remaining 10 per cent were from eastern Uttar Pradesh. They mostly belong to labour or poor caste families.

When we examined their food and personal habits it was observed that 90 per cent to 95 per cent were non vegetarian and 10 per cent to 5 per cent were vegetarian. They also had habit of smoking, drinking and tobacco chewing. Some of these had two or all these three types of bad habits. The reason for this may to relieve to their mental tension, release during working hours or to combat fatigue. The most of the workers have all three types of habits. The habit of drinking was found in 97 per cent and 99 per cent workers, smoking in 72 per cent and 82 per cent and tobacco chewing in 35 per cent and 29 per cent workers. A large number of these workers had poor relation with their families. Only fraction (6%) workers have excellent relations. These workers remained separately in nuclear families. Only 35 per cent - 18 per cent workers had fair to good relations. Similarly these workers remained cut off from the society. Only 15 per cent - 10 per cent had good social relations. Majority of them had no or poor relation because they did not find times to spare for social activities. One reason for poor social relation was that they remain in rented accommodation (90%-94%). Only 6 per cent had their own houses. Few workers were living as paying guest. The rented accommodation is not enough to live as they have small rooms in unhygienic places.

The workers in the dyeing industries are engaged in different types of the job like labours, to carry material from godown to the operation site, machine operators

handle the machines and drum operators operate drum that mix the dye with the fabrics. In the present study 61 per cent and 58 per cent workers were machine operators, 14 per cent were labourers and 12 per cent drum operators. Only 6 per cent and 9 per cent workers were employed as lab in-charge and finishers. As mentioned earlier there is no specific training for these types of the job but the workers learned themselves from the already employed person.

By working for longer duration the workers become efficient in their jobs. So they can be classified as skilled, semi-skilled or even unskilled. Since in these dyeing industries most of the workers were employed since last 4-15 years they have attained the skill in their jobs. Thus 92 per cent of workers became skilled, 6 per cent were semi-skilled and 2%-3 per cent workers were unskilled. Unskilled might be due to the carelessness or working of less time in these industries.

Dyeing industries wants to produce more material with less expenditure so they pay overtime to their workers for extra hour working. Some of the worker work for 18 hour a day (22% and 14% in natural and synthetic dyeing), around 20 per cent and 16 per cent work for 16 hour and half the number of workers works for 12 hour. To devote time to work depends upon the will of the workers or the personal requirements for them. Industry does not have a compulsion on it.

In spite of staying 6-15 years in all the category workers were poorly paid by the dyeing industry management. 22 and 17 workers in both industries were paid Rs. 1500-3500 per month, 30 and 35 were given Rs. 3600-5500 and only 8 workers in each industry were earning Rs. 5600-7000 per month. Such a meagre earning is not sufficient to get good food or medical help. This is one of the reasons of incidence of diseases in these workers. They can afford only two end meals for themselves and their families. All the 14 labourers in each industry were earning Rs. 1500-3500 in a month. Ten drum operators were also paid the same amount. Twenty two drum operators, 15 machine operators and 14 finishers were earning Rs. 3600-5500 per month. Only 4 machine operators 15 labs in charges were giving Rs. 5600-7000 per month.

When the workers were asked about their diseases, it was found that in their families only 1-2 person in different age groups were affected by one or the other types of diseases like some had sugar, other had heart

problem or kidney diseases, even then 88 per cent of the worker families have no diseases except, some minor and seasonal disorder. So, it could be hypothesised that the workers will have some hereditary problem/disease.

Further when they were asked about their diseases before joining the dyeing industry only 2-3 person the different age groups were having hypertension, stomach, eye or weakness. Only 15 workers were having minor ailment. One worker was asthmatic. The problems in natural dyeing workers were the same but the numbers of workers affected were less. Only 20-39 per cent workers were having different diseases. When the incidence of diseases was observed according to their job profile almost all the types of workers were affect by the diseases reported. But machine operators were more in number. The reason for this is the air pollution of the chemicals, solvents and dust within the factory premises and the long working hour. The medical facilities were all almost nil in these industries. Same was the case with natural dyeing workers.

While looking at the incidence of diseases presently in these workers it was observed that in synthetic dyeing the workers of all age groups were affected by multiple diseases like eye problems, earning loss, asthma, lung problem, allergy, skin and kidney problems, hair and teeth loss, weakness and blood pressure. The presented data on each age group. In all 85 per cent workers developed asthma, 43 per cent workers developed skin and hair problems and 28 per cent workers were having weakness and eye problems.

When compared the results of natural and synthetic dyeing workers it was observed that except one or two diseases the number of workers affected were more in synthetic dyeing industries. The reason for this may be the carelessness of those workers while handling the dyeing, chemicals and solvents. Another reason observed during the working hour the floors were spilled with chemical, dyes or solvents. No proper cleaning was done. The workers even have seen working in banyan and trousers. The chemicals come in contacted of their skin, none mouth mask was not given no was any apron provided to the workers in both types of dyeing industries.

Being involved in dyeing processes all the type of workers as labourers, machine operators, drum operators, lab in charge and finisher were affected almost equally because all were working since 3-7 years. In all age groups workers were employed mostly for 6-12 years.

Minimum working times was three years and maximum was 15 years. To work for such long duration in such odd situation might be due to non-availability of another suitable job. More over the workers are not much educated or trained in any specific trade.

Occupational diseases resulting from condition of work place due to physical exposure chemical, ergonomic or psychological hazards develop over a period of time. The increase in industrialization of developing countries is luring illiterate people to work in many industries without proper safety measures. This was also studied by Richard Hdmer (WHO) and Rastogi *et al.* (2007) studied the incidence of cancer in tanning industry under similar working conditions.

Many other diseases like breast cancer etc. were reported by Sneiderkes (2006); Chen and Huang (1997) and Smile *et al.* (2012). Many of them emphasized to do research in dyeing industries on chemical toxicity (Park and Shore, 2007; Ponrajand Cokita, 2011 and Arora *et al.*, 2011). It has also been noticed that the effluent of dye industry affects the nearby soils, water table pollution with heavy metals and fishes in the affected water bodies resulting in number of diseases (Furm, 2004).

Effect on dermatomes and occurrence of respiratory diseases were observed by reactive dyes (Estlander, 2006) and other hazards (Catherine, 1999) by acid dyes. Yakuba and Dorothy (2009) studies the effect of hand dye enter prizes on soil, environment and health of the workers. Won *et al.* (2008) reported asthma mortality in textile dye workers.

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