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## Research Article

### AWARENESS OF DYE INDUSTRIAL WORKERS ABOUT THEIR OCCUPATIONAL HEALTH HAZARDS IN KARUR [INDIA]

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#### ABSTRACT

The present study is about the health status of dyeing industrial workers in Karur, Tamil Nadu, India and influencing factors that is socio-economic and cultural environments in this region. The analysis is able to offer wide scope and identify the existing health conditions, personal hygiene, health problems, health care and treatment seeking behavior of workers. This paper also helps to provide better understanding of the people for those who are engaged dyeing industries related health problems, to make policy implementation of rules and regulations in dyeing workers related law in the state as well as at national level. Hence the present study has its effort to illuminate the health status and attitudes of dyeing workers in Karur town. The objective of the study is to assess the health risk factors and awareness of Occupational safety and health of workers in textile dyeing industries of Karur. A questionnaire schedule was used to evaluate the health problems and awareness of occupational safety and health among workers.

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#### INTRODUCTION

Thousands of workers are employed in dyeing industries under different job categories including dyeing, printing, finishing, cutting, weaving and spinning. The textile industry workers are exposed to a number of chemicals including dyes, solvents, optical brighteners, finishing agents and numerous types of natural and synthetic fibre dusts which affect their health[1]. The use of dyes and solvents in the textile industry are the main toxic substances used. Different types of dyes used in the textile industries pose a toxic effect [2]. Health at work is consideration to deal with the health problems related to employment. Occupational health is concerned with the health safety issue of work [3]. The hazards exposure in setting can adversely affect the human health [4,5].

#### MATERIALS AND METHODS

This paper attempts to focus on the health problems related to dyeing industries workers of Karur town. Karur is an industrial town located on the banks of the river Amaravathi. It is located at 10.95°N, 78.08°E and 396 km from Chennai on southwest direction. During the last four decades, the town emerged as a major textile centre with its 1000 odd power loom and handloom dye units producing bedspreads, towels and

furnishing. There are about 1000 units along a 17 km stretch on the banks of river Amaravathi, which undertake bleaching, dyeing, weaving, tailoring, knitting, knotting, packing, transporting and trading. There are 487 textile processing units in function many of the workers are employed in dyeing industries under different type of work. The study has evaluated the livelihood conditions and awareness about health hygiene and environmental conditions of this major industrial town.

The data collected from the questionnaire survey were coded and with the help of these coding sheets the data were transformed into SPSS.V.20. As much as 53 Variables were drawn from the data structure possibly covering the Socio-economic, demographic and environmental variables that are largely determined the behavioral pattern of workers of dyeing industries. These variables are assumed to be the vital factors in determining the health condition of the dyeing workers. Karl Pearson Correlation analysis was employed for the present data structure and accordingly a correlation matrix of 300 x 53 to facilitate easy interpretation of interrelationships between variables. These variables are assumed to be the most important factors while determining the livelihood conditions of dye industrial workers. Factor analysis was employed for the

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present data structure and accordingly a matrix of 300 x 53 was subjected to dimension reduction process. 17 out of 53 variables were extracted for the interpretation purpose of the present study. So the data were reduced to 17 X 17 inter-correlation matrixes to facilitate for easy interpretation and analysis. In addition to the above the factor loading matrix was used to explain the strength of relationship and the variance of each variable with all other variables.

**RESULTS AND DISCUSSION**

Principal component analysis is a useful tool for investigating variable relationships for complex parameters such as socioeconomic status or psychological scales. It allows researchers to investigate concepts that are not easily measured directly by collapsing a large number of variables into a few interpretable underlying factors. The results of factor analysis are very useful to determine the major dimensions of the health aspects of the respondents those who were working in these industries.

Five dimensions were identified and contributing a total variance of 65.76 per cent. An Eigen value of 1.0 is taken as a cut-off point to determine the number of dimensions to be extracted.

Correlation matrix revealed the presence of many coefficients of 0.496 and above. The Kaiser-Meyer-Oklun (KMO) value was 0.812, exceeding the recommended value of 0.6 and the Barlett’s Test of Sphericity reached statistical significance (.000) supporting the factorability of the correlation matrix. Principal components analysis revealed the presence of five components with Eigen values exceeding 1.0.

**Factor I: Level of knowledge on water pollution**

The “Level of knowledge on water pollution” has emerged as a single most vital factor with an Eigen value of 5.168 and the total variance of 19.19 percent. Five out of seventeen variables were loaded on this factor. The factor analysis has been clearly indicating that the variables namely Parts of the body affected by dying water(0.805), acquired diseases (0.775), dyeing water problem (0.762),level of knowledge towards dyeing water (0.744) and level of knowledge towards to polluted water (0.484) were highly correlated with the health aspects of the respondents. Thus, the respondents’ diseases were highly influenced and they reported that health problem as reported 59 percent of the respondents were suffered by health problem due to dying water, almost 61 percent of the respondents’ were

**Table 1** Factor Loadings

Factor	Name of the Factor	Variable Number	Name of the Variable	Factor Loading
I	Level of knowledge on water pollution	6	Part of body affected by dying water	0.805
		10	Acquired Diseases	0.775
		5	Dying Water Problem in Health	0.762
		9	Level of Knowledge towards to dying water	0.744
		13	Level of Knowledge towards to Polluted water	0.484
II	Perception towards pollution	15	Level of Knowledge towards to Cultivation	0.834
		11	Level of Knowledge towards to ground water	0.726
		14	Level of Knowledge towards to Agricultural Damage	0.680
		17	Level of Knowledge towards to water filter	0.677
III	Personal issues	2	Having Health Problems	0.880
		3	Acquired health problems	0.797
		7	Treatment taken	0.670
IV	Health seeking behaviour	8	Hand wash frequently	0.802
		16	Dipping hands in dye material in a day	0.727
V	Industrial Environment	12	Usage of water filter	0.824
		4	Protected water	0.493
			Sense of smell at the time of eating	0.458

**Table 2** Rotated component matrix

Variable Number	1	2	3	4	5	Communalities
6	0.805					0.742
10	0.775					0.721
5	0.762					0.628
9	0.744	0.418				0.745
13	0.484	0.457				0.496
15		0.834				0.733
11		0.726				0.641
14		0.680				0.588
17		0.677				0.669
2			0.880			0.782
3			0.797			0.703
7			0.670			0.595
1				0.802		0.684
8				0.727		0.536
16					0.824	0.742
12					0.493	0.572
4			0.452		0.458	0.602
Eigen Value	5.168	2.268	1.427	1.239	1.079	
Percentage of Variance	19.195	17.820	12.578	8.728	7.448	
Cumulative percentage	19.195	37.015	49.592	58.320	65.767	

Source: Results derived from SPSS

affected skin or stomach or legs or eyes. It is interesting to note that 50 percent of the respondents had the knowledge on dying water and its influence on health. Though they were known still they were ready to work in the field of dying work as they were all in poor living condition or to improve their living standards.

#### **Factor II: Perception towards pollution**

The second factor being "Perception towards pollution" of the respondents was found with the Eigen value of 2.268. There were four positive loading factors of the variables such as level of knowledge towards cultivation, level of knowledge towards ground water, level of knowledge towards agricultural damage and level of knowledge towards water filter with 0.834, 0.726, 0.680 and 0.677 respectively. The loading value represent the health problems were experienced by the respondents and their health condition either by level of knowledge toward cultivation, level of knowledge towards ground water, level of knowledge towards agricultural damage and level of knowledge towards water filter. Hence, the knowledge towards cultivation agricultural damage was reported to 53 and 58 percent respectively. It is very urgent to make awareness among the people that the industries must not let the contaminated water to be driven into the agricultural lands which spoils the cultivation that ultimately affects the food production.

#### **Factor III: Personal issues**

The factor of "Personal issues" has formed third important factor with an Eigen value of 1.427 and the total variance was 12.578. The positive loading factors were having health problem, acquired health problem and treatment taken with 0.880, 0.797 and 0.670 respectively. The reports of the respondents revealed that only 29 percent of them were not affected by any kind of diseases for those working in the dyeing industries but in contrast 71 percent affected by the diseases like respiratory, weakness fever or pain. Moreover, three fourth of the respondents' were reported as they were willing to work in these industries as they were all earning more than what they earn outside these industries.

#### **Factor IV: Health Seeking Behaviour**

The analysis of "health seeking behaviour" ranks fourth factor with the Eigen value of 1.239 and the total variance of 8.278 percent. There were two positive loading factors of the variables such as hand wash frequently and dipping hands in dye material in a day with the loading value of 0.802 and 0.727 respectively. It was observed from analysis that 52.3 percent were dipping their hands in dying materials every day and the same way they also reported hand wash done frequently. It showed that though they were dipping in to dyeing water to avoid serious caused by the problem.

#### **Factor V: Industrial Environment**

The factor "Industrial Environment" towards the health problem of the respondents was loaded with the Eigen value of 1.079. The variables such as usage of water, protected water and sense of smell at the time of eating had positive loading values of 0.824, 0.493 and 0.458 respectively. The analysis reveals that those who do frequently use water, sense of smell at the time of eating were reported with 51 and 74 percent respectively. It shows that the respondents were interested to take necessary steps to avoid health problem caused by the dying industries. But dying industries one or other ways certainly it may affect health of them.

### **CONCLUSION**

Factor analysis data on 17 extracted variable-items of a questionnaire has yielded the five factors retained in the analysis, labelled as 'Level of knowledge on water pollution, Perception towards pollution, Personal issues, Health Seeking Behaviour and Industrial Environment'. These five factors account for a cumulative variance of 65.767 per cent with first factor accounting for 19.195 per cent, second for 17.820 per cent, third factor for 12.578 fourth factors for 8.728 and the fifth factor is 7.448 Thus, the present study certainly revealed the health risks, health problems and livelihood conditions of dyeing industrial workers of Karur town.

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