



“A STUDY TO EVALUATE THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON PREVENTION OF OCCUPATIONAL HAZARDS IN TERMS OF KNOWLEDGE AMONG EMPLOYEES FROM SELECTED INDUSTRIES IN AHMEDABAD”

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ABSTRACT

STUDY: Effectiveness of structured teaching program regarding prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.

BACKGROUND: Preventing occupational hazards is one of the most vital aspects of work place safety and employee well-being. In the employees working in selected industries it reduces accidents, economic growth, improved worker satisfaction and also sustainable development. If not prevented it can lead to serious health, social and economic problems. It is therefore important to prevent the occupational hazards.

OBJECTIVE: The aim of the study is to assess the effectiveness of structured teaching programme regarding prevention of occupational hazards in terms of knowledge among employees and to find out the association between demographic variable with the pretest knowledge score.

METHODS: A pre-experimental (one group pretest posttest) design was adopted for collecting the data from 60 samples using a structured knowledge questionnaire comprising 30 questions which includes knowledge, application and comprehensive domains.

RESULTS: According to the findings, the mean post knowledge score was significantly higher than the mean pretest knowledge score with mean difference of 4.54. The calculated “t” value was 8.58 greater than the tabulated “t” value 2. Therefore, the null hypothesis H_0 was rejected and research hypothesis H_1 was accepted and it revealed that structured teaching programme was effective in increasing knowledge among the employees regarding prevention of occupational hazards in selected industries. The findings also revealed that a significant association has been found between selected demographic variables such as religion and educational status with pre-test knowledge score. Hence, the research hypothesis H_2 was accepted.

CONCLUSION: Structured teaching programme regarding prevention of occupational was effective in improving the knowledge among the employees. The findings clearly indicate that there is a greater need of awareness about prevention of occupational hazards among employees, so that they will be able to protect themselves and others from the harmful effects of occupational hazards.

INTRODUCTION

An “occupational hazard” is any workplace condition that causes a risk to employee health. The World Health Organization (WHO) defines an occupational hazard as “A hazard experienced in the workplace that can cause harm or adverse health effects to workers.” An occupational hazard is an injury or ailment resulting from the work one does or from the surrounding in which one works. Prevalence of workplace safety issues is a common phenomenon in the world and it is more serious in developing regions in particular. The consequences of workplace hazards could be trauma, even posttraumatic stress disorder (PTSD), loss of dignity, anxiety, depression, suicide attempt, and decreased self-esteem, lack of trust in people, premature aging, losing autonomy, injuries, absenteeism and physical and musculoskeletal injuries. The major components of health industries are health care services, workplace exposure and hazards. Healthcare workers play a critical role in public health by providing essential medical care to patients. However, their work environment exposes them to a wide range of occupational hazards that can compromise their health and well-being. Occupational hazards are risks or dangers arising from work environments or job activities that can cause injury, illness or long term health problems to workers, in health care these hazards affect doctors, nurses, lab technician, cleaners and other staff. There are different types of occupational health hazards such as biological, chemical, physical, ergonomic and fire and electrical hazards. The primary objective of studying occupational hazards is to identify and mitigate risks that can harm workers’ 3 physical and mental health & understanding the hazards helps to create a healthy work environment.

Statistical data on Occupational Hazards

Workplace Fatalities: - 2.78 million workers die annually due to occupational accidents or work-related diseases. This includes both accidents (e.g., machinery injuries, falls) and occupational diseases (e.g., respiratory diseases, cancers due to exposure to hazardous chemicals). Fatalities are predominantly in sectors like construction, agriculture, mining and manufacturing

Construction: Construction workers account for a significant proportion of these fatalities, with risks like falls, equipment-related injuries and exposure to dangerous materials

Agriculture: This sector has a particularly high rate of fatal injuries due to machinery accidents, pesticide exposure and working in hazardous conditions.

Mining: Mining-related fatalities remain a major issue in many countries, especially in developing regions like China, India and parts of Africa.

2. Non-Fatal Injuries: - 370 million occupational injuries are reported annually worldwide, not including long-term illnesses.

4. Psychosocial Hazards: - **Workplace Stress.** The WHO has identified that workplace stress leads to mental health disorders including depression and anxiety which are now recognized as major contributors to disability worldwide. A study in 2017 estimated that stress-related diseases and mental health problems account for 30% of global work related diseases. Of the country’s 500 million workers only less than 10% of are covered by some health and safety legislation. Epidemiologists have estimated an annual 36,700 fatalities, 1,83,00,000 injuries and 18,50,000 diseases related to occupational hazards. According to the International Labor Organization (ILO), India records more than 40,000 workplace fatalities annually, and millions of workers suffer from occupational diseases due to unsafe working environments. The high rate of hazards is largely attributed to lack of awareness about workplace safety, inadequate enforcement of occupational health laws, poor infrastructure and limited access to protective equipment. In addition, rapid industrialization, informal employment practices, and the presence of unskilled labor further increase workers’ vulnerability. These factors collectively contribute to unsafe working conditions, resulting in frequent accidents, injuries and long-term health

OBJECTIVES OF THE STUDY

1. To assess the pre-test knowledge score on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.
2. To assess the post-test knowledge score on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.
3. To evaluate the effectiveness of structured teaching programme on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.

4. To find out the association between selected demographic variables and pretest knowledge level on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.

METHODS

A pre-experimental study (One group pre-test-post-test) was conducted in October 2025 by using a structured knowledge questionnaire among employees from selected industries in Ahmedabad city. Formal permission was obtained from concerned authorities of selected industries at Ahmedabad city by presenting the protocol of research study. The investigators prepared the data collection schedule and plan for the entire procedure. The data collection procedure was conducted in the month of October 2025 from selected industries at Ahmedabad. Samples were selected by Non-probability convenience sampling technique. The investigators explained the objectives of the study and obtained consent for participation in the study. The investigator had administered Pre-test, time duration 10 minutes and then administered Structured teaching program with time duration 45 minutes and with use of A.V. Aids on the same day. The post test was taken after 7 days.

The structured knowledge questionnaire was developed for the present study to assess knowledge among employees from selected industries at Ahmedabad. The tool was divided into 2 sections. Section-I comprises demographic variables of the samples such as age, gender, religion, area of residence, educational status, job tenure, monthly income, working hours, habits, awareness of ESIC, previous knowledge of ESIC scheme. Section-II comprises Structured knowledge Questionnaire which consists of 30 items focuses on 6 areas ,Definition, types, impact of hazards, preventive measures, safety standards and occupational acts and schemes According to these areas the investigator has formulated multiple choice questions which comprise 30 items with the maximum score of 30. Every correct answer was given a score of 1 and wrong answer was given a 0 score. The answer key for structured knowledge questionnaire was prepared. The response given by the sample was addressed by putting a tick mark [√] in box provided along with each options given.

The content validation of tool and Structured teaching program was done by 5 experts which includes 5 Nursing experts specialized in Community Health Nursing. The reliability of the structured knowledge questionnaire was determined by Test- retest method before pilot study. With test-retest method, the reliability of the structured knowledge questionnaire was found (By Karl Pearson Correlation Coefficient Formula) 0.89 which was more than 0.7 hence the structured knowledge questionnaire was found to be reliable. Descriptive and Inferential statistics were used for data analysis and interpretation.

RESULTS:-

ANALYSIS AND INTERPRETATION OF THE DEMOGRAPHIC VARIABLES OF THE SAMPLES.

Table: 1: Frequency and percentage wise distribution of samples based on demographic data

	DEMOGRAPHIC VARIABLES		FREQUENCY	PERCENTAGE
1.	Age group	21-25 Years	22	36.67
		26-30 Years	18	30
		31-35 Years	13	21.67
		36-40 Years	4	6.67
		41-45 Years	3	5
2.	Gender	Male	49	81.67
		Female	11	18.33
3.	Religion	Hindu	58	96.67
		Christian	0	0
		Muslim	1	1.67
		Others	1	1.67
4.	Area of residence	Employer provided residence	21	35
		Urban slums/ rented rooms	25	41.67
		Near industrial areas of factories	4	6.67
		None of the above	10	16.67
5.	Educational status	Primary	7	11.67
		Secondary	2	3.33
		Senior secondary	14	23.33
		Graduate	24	40
		Others	13	21.67

6.	Job tenure	Less than a year	23	38.33
		1-5 years	21	35
		6-10 years	8	13.33
		More than 10 years	8	13.33
7.	Type of sector	Manufacturing	1	1.67
		Chemical & pharmaceutical	0	0
		Services based	46	76.67
		Technical based	2	3.33
		Others	11	18.33
8.	Monthly income	Less than 15000 ₹	16	26.67
		15000- 30000 ₹	26	43.33
		30000- 45000 ₹	5	8.33
		More than 45000 ₹	13	21.67
9.	Habits	Tobacco & smoking	4	6.67
		Alcohol	2	3.33
		All the above	5	8.33
		None of the above	49	81.67
10.	Working hours	4-8 hours	3	5
		8-12 hours	55	91.67
		More than 12 hours	2	3.33
11.	Awareness about ESIC	Yes, fully aware	31	51.67
		Know but not much aware	12	20
		Not aware	13	21.67
		Prefer not to say	4	6.67
12.	Previous knowledge about prevention of occupational hazard	Yes	32	53.33
		No	28	46.67

Table 1 shows that out of 60 samples,

In age, maximum 22(36.67%) samples were from 21 to 25 years of age and minimum 3 (5%) samples were from 41 to 45 years of age.

In gender, maximum 41 (81.67%) samples were male and a minimum 11 (18.33%) samples were female.

In religion, maximum 58 (%) samples were Hindu and minimum 01 (1.67%) sample were others.

In area of residence, maximum 25 (41.67%) samples were from Urban slums/ rented rooms and minimum 04 (6.67%) samples were from Near industrial areas of factories.

In educational status, maximum 24 (40%) samples were graduate, and minimum is 02 (3.33%) samples were from secondary.

In Job tenure, maximum 23 (38.33%) samples belong to less than a year of job tenure, and a minimum 08 (13.33%) samples belong to two categories i.e., 6 years- 10 years and more than 10 years.

In type of sector, maximum 46 (76.67%) samples belong to service based and minimum 01 (1.67%) samples belong to manufacturing.

In monthly income, maximum 26 (43.33%) samples 15,000 to 30,000rs and a minimum 05 (8.33%) samples 30,000 to 45,000rs.

In habits, maximum 49 (81.67%) samples belong to none of the above and minimum 02 (3.33%) belongs to alcohol.

In working hours, maximum 55 (91.67%) samples belong to a duration of 08 to 12 hours and minimum 02 (3.33%) belongs to more than 12 hours.

In awareness about ESIC scheme, maximum 31 (51.65%) belongs to yes, fully aware and minimum 04 (6.67%) belongs to prefer not to say

In previous knowledge about prevention of occupational hazard, maximum 32 (53.33%) samples belong to Yes, having knowledge and minimum 28 (46.67%) belong to No, not having knowledge.

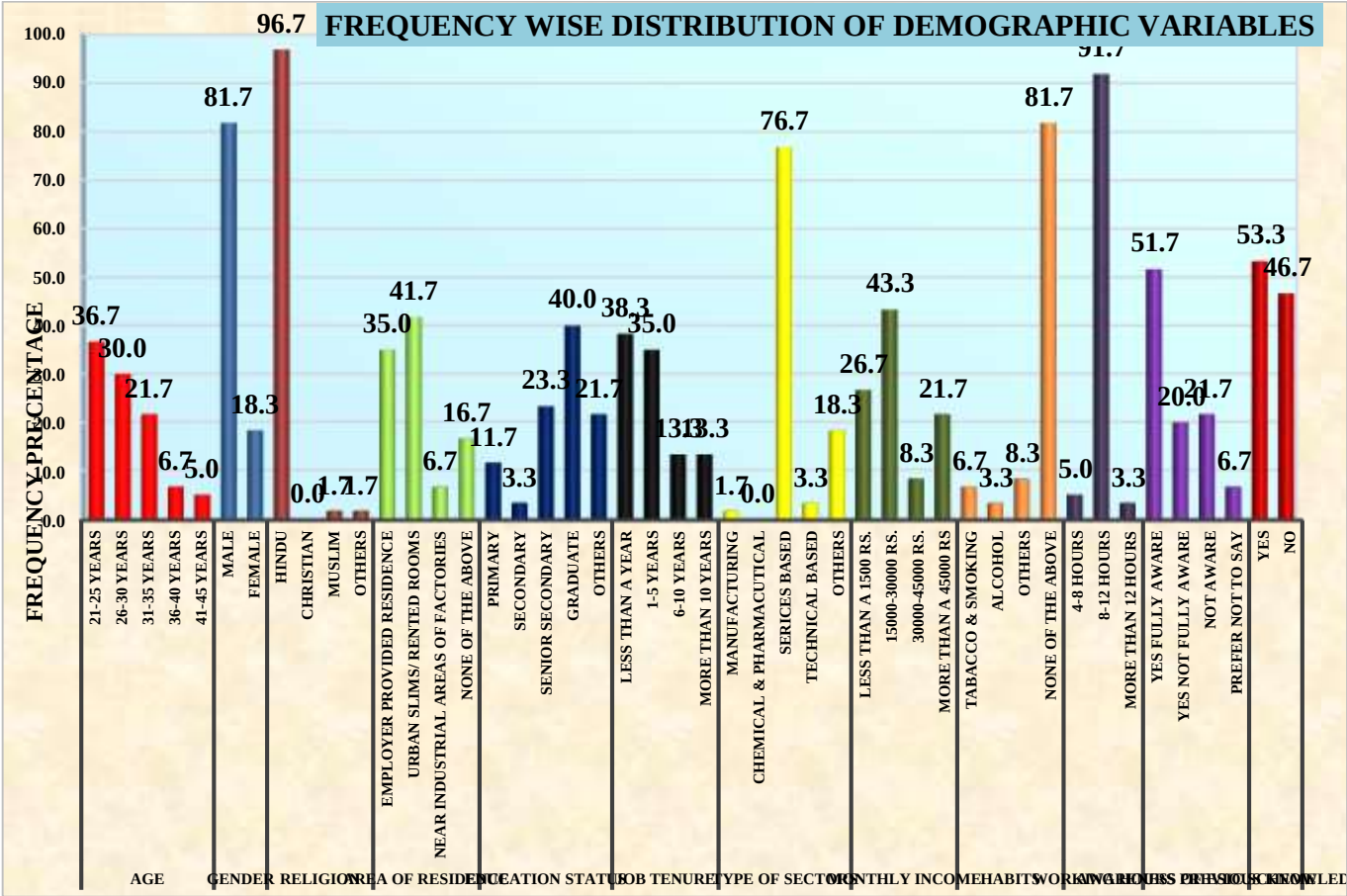


TABLE 2: Frequency and Percentage distribution of the pretest and post-test knowledge score measured by Structured knowledge questionnaire regarding prevention of occupational hazards.

KNOWLEDGE SCORE	PRE TEST		POST TEST	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
POOR (01-10)	9	15%	2	3.3%
AVERAGE (11-17)	25	41.7%	12	20%
GOOD (18-25)	22	36.7%	37	61.7%
EXCELLENT (26-30)	4	6.7%	9	15%
TOTAL	60	100.0%	60	100.0%

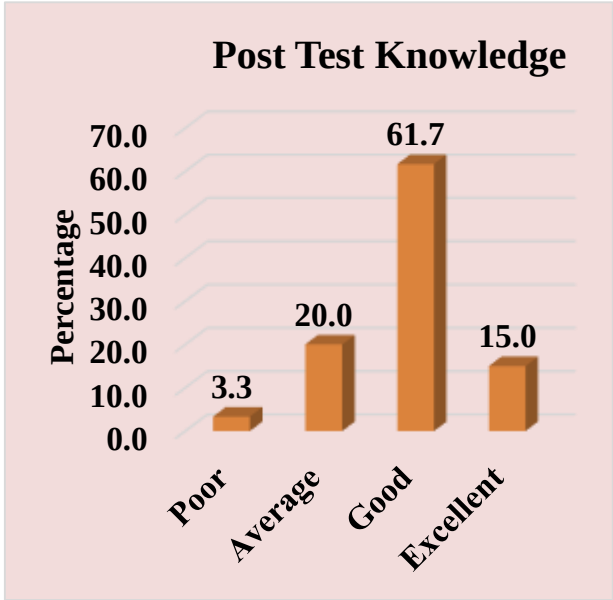
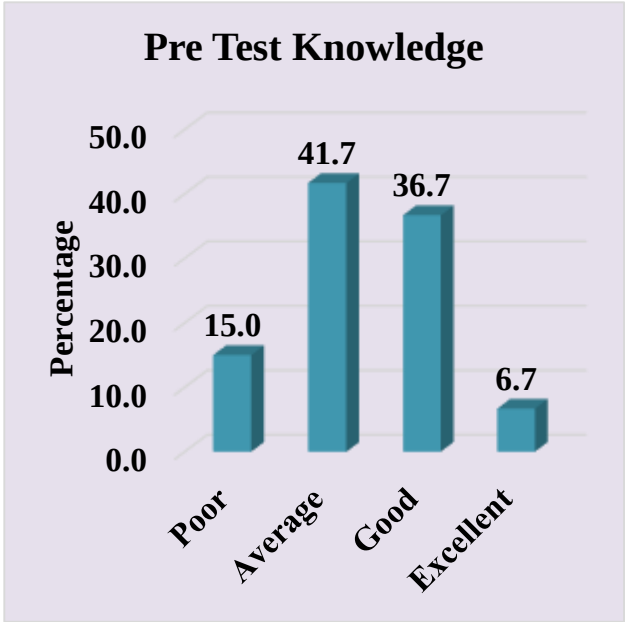


Table 2 Shows that 09(15%) samples were poor, 25 (41.7%) samples were average, 22 (36.7%) samples were good and 4 (6.7%) samples were excellent knowledge as per their pre-test knowledge score whereas 02 (3.3%) samples were poor, 12 (20%) samples were average, 37 (61.7%) samples were good and 9 (15%) samples were excellent knowledge as per their post-test knowledge score

Table 3: Mean, Mean Difference, Standard Deviation (SD) and ‘t’ test value of the Pre-test and Post-test Knowledge scores of samples. [N=60]

SR NO.	CONTENT (AREA)	MAXIMUM SCORE	PRE-TEST KNOWLEDGE SCORE		POST-TEST KNOWLEDGE SCORE		MEAN DIFFERENCE	% GAIN
			Mean	Mean %	Mean	Mean %		
1.	Definition	04	3.25	81.25	3.73	93.33	0.48	12.08
2.	Types	04	1.77	44.17	3.25	81.25	1.48	37.08
3.	Impact of hazard	04	2.28	57.08	3.13	78.33	0.85	21.25
4.	Preventive measures	13	6.22	47.82	7.07	54.36	0.85	6.54
5.	Safety standards	02	1.13	56.67	1.48	74.17	0.35	17.50
6.	Occupational acts and schemes	03	1.83	61.11	2.35	78.33	0.52	17.22
	TOTAL	30	16.48	54.94	21.01	70.06	4.53	15.11

Table 3: shows the pretest and post-test knowledge score obtained by samples on the prevention of occupational hazards among the employees from selected industries in Ahmedabad.

The area wise result of definition, pretest mean score was 3.25 (81.25%) and post-test mean score was 3.73 (93.33%), hence the difference noted was 0.48 and percentage gain in this area is 12.08%.

The area wise result of types, pretest mean score was 1.77 (44.70%) and post-test mean score was 3.25 (81.25%), hence the difference noted was 1.48 and percentage gain in this area is 37.08%.

The area wise result of impact of hazards, pretest mean score was 2.28 (57.08%) and post-test mean score was 3.14 (78.33%), hence the difference noted was 0.85 and percentage gain in this area is 21.25%.

The area wise result of preventive measures, Pre-test mean score was 6.22(47.82%) and Post-test mean score was 7.07(54.36%), hence the difference noted was 0.85 and percentage gain in this area is 6.54%.

The area wise result of safety standards, Pre-test mean score was 1.13(56.67%) and Post-test mean score was 1.48 (74.17%) hence the difference noted was 0.35 and percentage gain in this area is 17.50%.

The area wise result of acts and scheme, Pre-test mean score was 1.83(61.11%),and Post-test mean score was 2.35 (78.33%), hence the difference noted was 0.52 and percentage gain in this area is 17.22%.

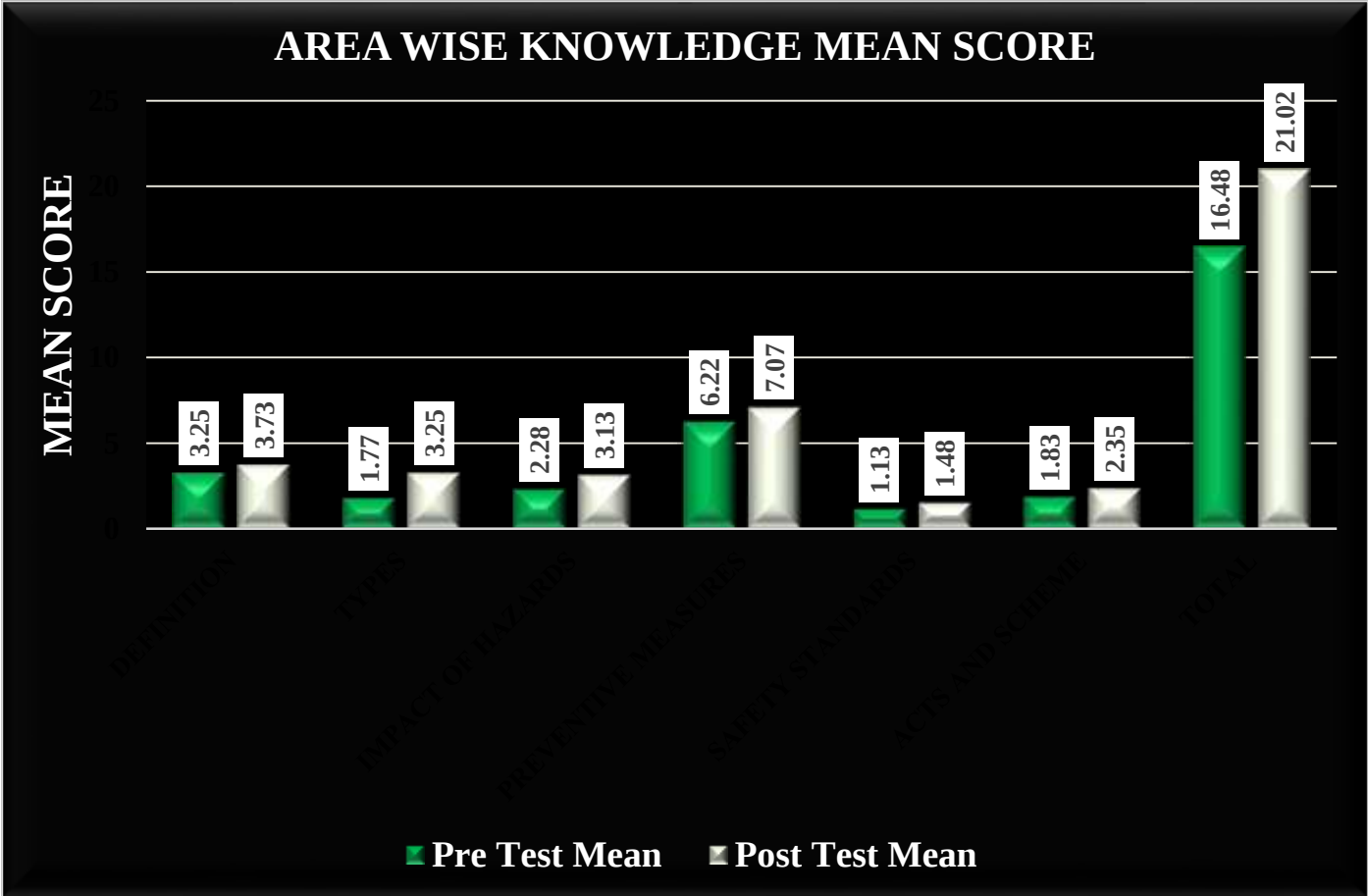
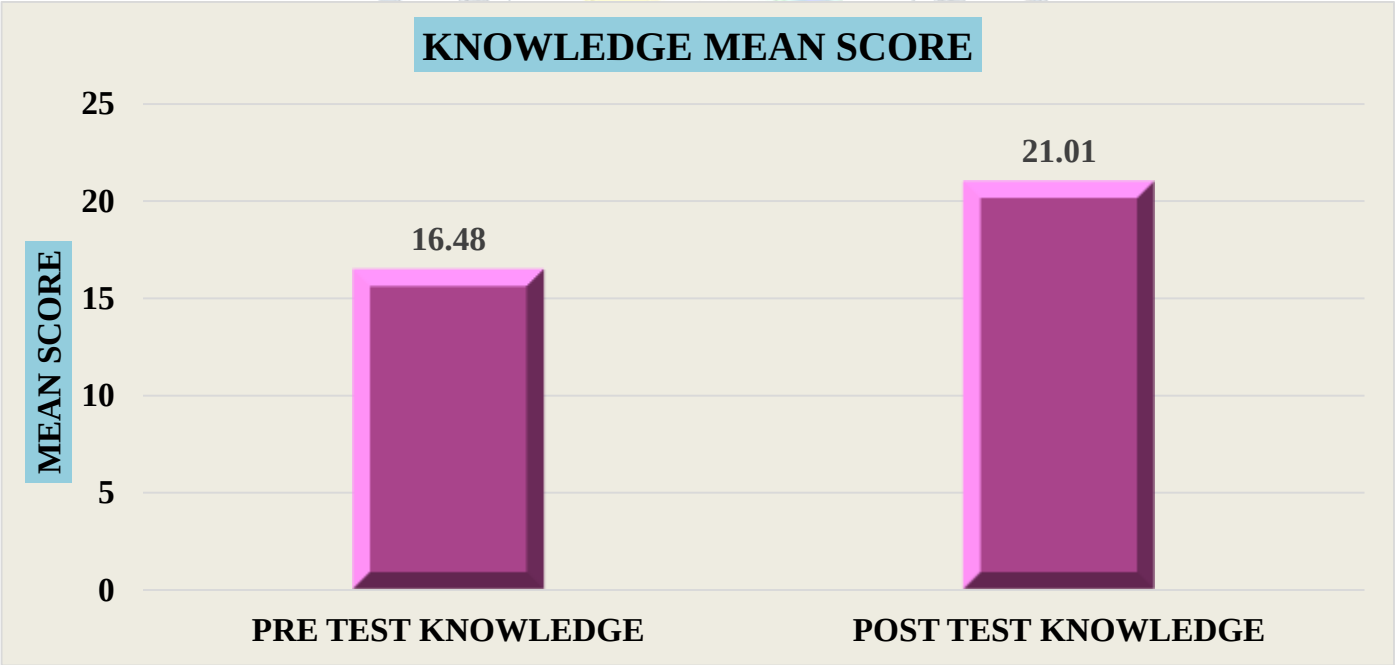


Table 4.Mean, Standard Deviation (SD), Calculated 't' test value and Degree of freedom of the Pre-test and Post-test Knowledge scores of samples.

Knowledge test	Mean	Mean difference	Std. Deviation	Calculated “t” test	DF	Table value	S/NS
Pre-test knowledge	16.48	4.53	5.46	8.586	59	2	Significant
Post-test knowledge	21.01		5.11				

Table 4 shows the Pre-test and Post-test knowledge scores obtained by the respondents on prevention of occupational hazards. The mean pre-test knowledge score was **16.48** and the mean post-test knowledge score is **21.01**. The mean difference between pre-test and post-test knowledge score is 4.53. The table also shows that the standard deviation of pre-test score of knowledge is 5.46 and standard deviation of post-test score of knowledge is 5.11. The calculated "t" value is **8.586** and the tabulated "t" value was **2.00** at 0.05 level of significance.

Above table reveals that the mean post-test knowledge score was significantly higher than the mean pre-test knowledge scores. The calculated "t" value (t= 8.586) was greater than the tabulated "t" (t=2.00). Therefore, the **null hypothesis H₀ was rejected**, and the research hypothesis **H₁ was accepted** which indicates that the structured teaching program was effective in gaining knowledge among the samples. Investigators concluded that there was significant increase in the mean post-test knowledge score as compared to the mean pre-test score after administration of structured teaching program on knowledge regarding prevention of occupational hazards which indicates that the structured teaching program was effective.



ANALYSIS AND INTERPRETATION OF THE DATA RELATED TO ASSOCIATION BETWEEN PRE-TEST KNOWLEDGE SCORES WITH SELECTED DEMOGRAPHIC VARIABLES OF THE SAMPLES.

Table No 5 Association of Pre-test knowledge score with selected Demographic Variables.

[N=60]

Demographic variables		Pre-test				Total	Chi square	DF	Table value	S/N S
		Poor	Average	Good	Excellent					
Age group	21-25 years	2	8	8	4	22	12.39	12	21.02	NS
	26-30 years	4	6	8	0	18				
	31-35 years	2	8	3	0	13				
	36-40 years	1	2	1	0	4				
	41-45 years	0	1	2	0	3				
Gender	Male	7	21	19	2	49	3.18	3	7.82	NS
	Female	2	4	3	2	11				
Religion	Hindu	9	24	22	3	58	15.63	6	12.59	S
	Muslim	0	0	0	1	1				
	Other	0	1	0	0	1				
Area of residence	Employer provided residence	3	12	6	0	21	13.27	9	16.91	NS
	Urban slums/rented rooms	3	9	11	2	25				
	Near industrial areas or factories	2	2	0	0	4				
	None of the above	1	2	5	2	10				
Educational status	Primary (1st to 8th standard)	2	4	1	0	7	21.74	12	21.02	S
	Secondary (9th to 10th standard)	1	1	0	0	2				
	Senior Secondary(11th & 12th)	3	8	3	0	14				
	Graduate	3	9	8	4	24				
	Others	0	3	10	0	13				
Job Tenure	Less than a year	4	7	10	2	23	11.30	9	16.91	NS
	1-5 years	5	10	5	1	21				
	6-10 years	0	2	5	1	8				
	More than 10 years	0	6	2	0	8				
Type of sector	Manufacturing(machinery, textile, bag)	0	1	0	0	1	6.50	9	16.91	NS
	Service based(hospitality , education, healthcare)	7	21	16	2	46				
	Technology / IT sector	0	1	1	0	2				
	Others(specify):	2	2	5	2	11				
Monthly Income	Less than 15,000 ₹	3	8	5	0	16	12.87	9	16.91	NS
	15,000 – 30,000 ₹	6	11	8	1	26				

	30,000 – 45,000 ₹	0	3	1	1	5				
	More than 45,000 ₹	0	3	8	2	13				
Habits	Tobacco and Smoking	1	2	1	0	4	5.13	9	16.91	NS
	Alcohol	1	0	1	0	2				
	Others	0	3	2	0	5				
	None of the above	7	20	18	4	49				

Table 5 shows the association of the demographic variables of the samples.

- **S – Significant**
- **NS – non-significant**

Table 4.3 Association of Pre-test knowledge score with selected demographic variables.

[N=60]

Table 4.3 shows the association of the demographic variables of the samples.

For age group of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 12.39 is less than 21.02, the table value of Chi square (χ^2) at the 12 degrees of freedom and 0.05 level of significance. Therefore, age group of samples has no significant association with the knowledge of samples.

For gender of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 3.18 is less than 7.82, the table value of Chi square (χ^2) at the 3 degrees of freedom and 0.05 level of significance. Therefore, gender of samples has no significant association with the knowledge of samples.

For religion of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 15.63 is more than 12.59, the table value of Chi square (χ^2) at the 6 degrees of freedom and 0.05 level of significance. Therefore, religion of the samples has a significant association with the knowledge of the samples.

For area of residence of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 13.27 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, area of residence of samples has no significant association with the knowledge of samples.

For educational status of the samples with the pre-test knowledge scores, the calculated value of chi square (χ^2) 21.74 is more than 21.02, the table value of chi square (χ^2) at the 12 degrees of freedom and 0.05 level of significance. Therefore, educational status of the samples has a significant association with the knowledge of the samples.

For job tenure of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 11.30 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, job tenure of samples has no significant association with the knowledge of samples.

For type of sector of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 6.50 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, type of sector of samples has no significant association with the knowledge of samples.

For monthly income of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 12.87 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, monthly income of samples has no significant association with the knowledge of samples.

For habits of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 5.13 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, habit of samples has no significant association with the knowledge of samples.

For working hours of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 3.84 is less than 12.59, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, working hours of samples have no significant association with the knowledge of samples.

For awareness about ESIC scheme of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 10.63 is less than 16.91, the table value of Chi square (χ^2) at the 9 degrees of freedom and 0.05 level of significance. Therefore, awareness about ESIC scheme of samples has no significant association with the knowledge of samples.

For previous knowledge on prevention of occupational hazards of the samples with the pre-test knowledge scores, the calculated value of Chi square (χ^2) 2.85 is less than 7.82, the table value of Chi square (χ^2) at the 3 degrees of freedom and 0.05 level of significance. Therefore, previous knowledge on prevention of occupational hazards of the samples has no significant association with the knowledge of the samples.

DISCUSSION

The present study was conducted to evaluate the effectiveness of structured teaching programme on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad

The investigators collected the samples by Non-probability Convenience sampling technique. The investigators collected the data by using structured knowledge questionnaire to evaluate the effectiveness of structured teaching programme on prevention of occupational hazards in terms of knowledge among employees from selected industries in Ahmedabad.

The tool consists of demographic variables, structured knowledge questionnaire to evaluate the knowledge regarding prevention of occupational hazards. The main study was conducted in month of October 2025, on 60 employees who were selected by non-probability convenience sampling technique. After the selection of samples, the level of knowledge was assessed by using the structured knowledge questionnaire.

The investigators collected the data from employees from selected industries who were willing to participate in the study. Then each sample was allotted number and selected required sample size using convenience sampling technique. The selected samples for study were then given test using validated structured knowledge questionnaire. The descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics were used to analyse the data.

The study shows that the mean pre-test knowledge score was 16.48 and the mean post-test knowledge score was 21.01. The mean difference between pre-test and post-test knowledge score was 4.53. The table also shows that the standard deviation of pre-test score of knowledge was 5.46 and standard deviation of post-test score of knowledge was 5.11. The calculated "t" value was 8.586 and the tabulated "t" value was 2 at 0.05 level of significance.

It reveals that the mean post-test knowledge score was significantly higher than the mean pre-test knowledge scores. The calculated "t" value ($t=8.586$) was greater than the tabulated "t" ($t=2$).

5.5 CONCLUSION

The following conclusions can be drawn from the present study findings:

The structured teaching program was found to be effective in terms of knowledge among the employees about the prevention of occupational hazards. From selected demographic variables only two variables religion and Educational status of the samples have a significant association with the knowledge of the samples and no any other demographic variables have a significant association with the pre-test knowledge score of the samples.

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