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A Study to Assess the Effectiveness of Health Education on Knowledge Regarding Silicosis and its Prevention among the Workers of Selected Granite Factories of Udaipur City

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INTRODUCTION

In the modern world there are lots of occupations which are growing to improve the economical status of the people. As the occupations are growing the new diseases are also emerging in the workers who are involving in particular occupation.

Now a day's diseases are developing according to the occupation in which the worker is involving. Hence occupational health is becoming the important field to focus in order to improve the health status of the workers. Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupation; the prevention among workers of departures from health caused by their working conditions; the protection of the worker in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment, and, to summarize, the adaptation of work to man and of each man to his job.1

Among many occupational disorder, Silicosis is one which causes morbidity & mortality among the workers of mining industries. It is caused by inhalation of dust containing free silica or silicon dioxide (sio2). It was first reported in India from the kolar gold mines (Mysore) in 1947. Ever since, its occurrence has been uncovered in various other industries, e.g., mining industry (coal, mica, gold, silver, lead, zinc, manganese and other metals), pottery and ceramic industry, sand blasting, metal grinding, building and construction work, rock mining, iron and steel industry and several others. Silicosis causes fibrosis and destruction in the lung that proves fatal in due course of time it is one of the world's oldest known diseases that continue to kill people in occupations where workers are exposed to respirable fine dust over a long period.2

In India, an estimated three million workers are exposed to silica in mines and in industries, such as stone cutting, silica milling, agate, slate pencil, etc. Among these, the highest prevalence of silicosis is in the slate pencil industry (54.5%) followed by workers in agate industries (38%).High mortality rates due to silicosis is especially true of unorganized sector probably because of comorbidities such as tuberculosis and malnutrition. However, studies on silicosis in the unorganized sector, especially in a setting like India, are scarce. In the unorganized sector, small stone polishing units that are based in the homes of workers do not fall under the purview of the factories act and are, therefore, not accessible for monitoring to regulatory authorities such as the factory inspectorate. In addition, since the work is done at home, primary workers and their family members are always at risk of silicosis due to the exposure to repairable dust.[2]

Silicosis is an ancient and well-known occupational lung disease caused by the inhalation of free crystalline silica. Certain occupations expose individuals to high concentrations of silica, which is fibrogenic to the lungs, resulting in radiological and pathological abnormalities. With time, the occupations causing silicosis have been varied. Silicosis due to denim sandblasting has recently been identified as a new cause of silicosis. Sandblasting is one of the most dangerous forms of exposure to silicosis, and it causes immediate and severe disease development. However, there is also a variation in the

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latency period and severity of the disease among people working with sandblast silica-containing materials such as sifted sea sand. Many factors may play a role in the development of the disease as well as in its latency period and severity, including the respirable dust concentration in the workplace, individuals' age, smoking habits, and use of protective equipment. Because there is a considerable variation regarding the latency period and disease severity among the workers who operate under the same conditions, the claim that there might be an individual susceptibility to silica dust is plausible.[3]

Silicosis refers to the formation of small, typically round nodules in the lungs of people exposed to crystalline silica dust. Silicosis is a potentially fatal, irreversible, progressive and untreatable fibrotic lung disease caused by prolonged inhalation and deposition of repairable crystalline silica. Pulmonary tuberculosis is a common complication before silicosis. It may occusilicosis, but silicosis is more likely to occur in older workers having a prolonged history of repairable air-borne dust exposure.[4]

In the mica mines of Bihar, out of 329 miners examined, 34.1 percent were found suffering from silicosis. In a ceramic and pottery industry, the incidence of silicosis was found to be 15.7 percent. The incidence of silicosis depends upon the chemical composition of the dust, size of the particles, duration of exposure and individual susceptibility. The higher concentration of free silica in the dust, the greater interior of the risk of developing silicosis. It is found that the incubation period may vary from a few months up to 6 years of exposure, depending upon the above factors.[1]

NEED FOR THE STUDY

Silicosis is a worldwide problem, and is especially prevalent in low- and middle-income countries, in which the burden is often underreported because of poor surveillance. China appears to have the highest burden of silicosis, with more than 500,000 cases recorded between 1991 and 1995, and 6000 new cases and more than 24,000 deaths reported annually. The problem is particularly serious among workers in small-scale mines in developing countries.[5]

HasanBayram and Andrew J. Ghio(2011) A study conducted on "Killer Jeans and Silicosis "Silicosis is one of the most ancient of disease, This pneumoconiosis became a greater public health problem after the industrial revolution introduced mechanization (e.g., use of power drills), which increased both dust levels and the number of exposed workers. Outbreaks in the United States (the Joplin epidemic from 1911–1916 and the scandal at Hawk's Nest Tunnel in Gauley Bridge, West Virginia during 1930 and 1931) further delineated the strong relationship between silica exposure, lung disease, and human mortality. Silicosis was then recognized as the "King of Occupational Diseases," and many governments covered its resultant disability within workers' compensation schedules. In the 1960s, after being declared a disease of the past in the United States, widespread silicosis was documented among workers at the Avondale Shipyards in Louisiana. Cases of silicosis have continued to be reported especially in foundry work, tunnelling, and mining, sandblasting, and quarrying. The disease persists in both developing and developed countries as a result of not applying protective measures against dust.[6]

Jai Krishna Pandey, Deepa Agarwal (2012) A study conducted on "Biomarkers: A potential prognostic tool for silicosis "revealed that Acute silicosis can develop after 2-5 years of frequent exposure to high levels of repairable dust containing silica. Acute silicosis occurs among underground miners working under uncontrolled conditions with no respiratory protection, in tunnelling workers and sandblasters. Accelerated silicosis can occur in workers after 10 or more years of exposure to very high levels of silica dust. Chronic silicosis can occur in workers exposed to fairly high levels of silica dust for extended periods of time (more than 15 years). Coal mining workers contract a similar type of disease called CWP (coal workers pneumoconiosis) due to exposure to coal dust containing silica. Data from coal India Limited showed that up to 41 new cases have been diagnosed in the year 2004. Shows the trends of diagnosing new cases of CWP in Coal India Limited over a period of 17 years from 1994 to 2010. Since the cases are mostly diagnosed at a later stage of service, total cases at a time may not be very high mainly due to their superannuation and there are only 52 proved cases of CWP as on 01 January 2010.[4]

Nayanjeet Chaudhury, Rajiv Paliwal et.al.(2012) A study conducted on "Co-morbidities among silicotics at Shakarpur" revealed that high morbidity and mortality among agate stone workers of Shakarpur due to silicosis. Besides the fatal disease, the workers also suffer from debilitating co-morbidities especially tuberculosis and under nutrition. Silicosis is known to shorten substantially the lifespan of a person exposed to fine silica dust over prolonged period. In Agate stone polishing industries of India, about 38% of workers develop silicosis in their lifetime. Not only workers in this industry develop silicosis due to the chronic exposure to the dust, their families and other non occupational groups that also reside within the area develop silicosis (6.8 - 11.8 %), Silico-tuberculosis (2.8 - 6.3%), and tuberculosis (TB) (19.7 - 20.1%).[2]

Hence it is felt need of a researcher's to throw a light on the status of silicosis disease among the workers of granite factories, as the dangerous disease may affect the works personal, economical & social life. In order to improve the skills of preventing the occurrence of this disease the workers knowledge has to assess.

OBJECTIVES OF THE STUDY

1. To assess the pre test knowledge score regarding silicosis and its prevention among the workers of granite factories.
2. To prepare and administer the health education regarding silicosis and its prevention to workers of granite factories.
3. To assess the post the test knowledge score regarding silicosis and its prevention among the workers of granite factories.
4. To assess the effectiveness of health education regarding silicosis and its prevention among the workers of granite factories.
5. To find out the association between pre test knowledge score with selected demographic variables.

OPERATIONAL DEFINITIONS

1. **Assess: -** In this study, it refers to the way of finding the knowledge of granite workers regarding Silicosis and its prevention.
2. **Effectiveness: -** In this study, it refers to gain in knowledge as determined by significant difference in pre- test and post- test knowledge score.
3. **Health education: -** In this study, it refers to the systematically developed designed health posters and charts followed by group discussion aimed at encouraging granite workers regarding various aspects (silicosis, risk factors, pathophysiology, signs and symptoms, early identifications of complications, prevention of silicosis) of silicosis and its prevention.
4. **Knowledge:** In this study, it refers to ability of granite workers to respond to structured questionnaire regarding silicosis and its prevention.
5. **Silicosis-** In this study, it refers to silicosis is an untreatable chronic occupational lung disease caused by prolonged inhalation of 'Silica' dust.
6. **Prevention-** In this study, it refers to the process of retarding or hindering the occurrence of Silicosis and its complications.
7. **Workers-** In this study, it refers to the employees who are working in the granite factories and involves in activities like drilling, stone cutting, sand blasting and transportation of granites.

ASSUMPTIONS

1. Workers may have inadequate knowledge regarding Silicosis and its prevention.
2. Workers knowledge regarding Silicosis and its prevention can be measured by structured knowledge questionnaire.
3. Workers knowledge regarding Silicosis and its prevention can be improved by conducting health education programme.

HYPOTHESIS

H_1:- There will be significant difference between pre and post-test knowledge scores of the workers regarding Silicosis and its prevention

H_2:- There will be significant association between pre-test knowledge scores and selected demographic variables.

VARIABLES OF THE STUDY

1. Independent variables:

In this study its Refers to Health education programme.

2. Dependent variable

In this study it refers to Knowledge of granite factories workers regarding silicosis and its prevention.

3. Demographic variable:

The socio demographic variable confound the relationship between the independent and dependent variable and that need to be controlled either through building in research design or through statistical procedure In this study, socio-demographic variables are age, educational status, monthly income of family, habit of cigarette smoking, working experiences, personal experience with silicosis, source of the about information.

RESEARCH APPROACH

Research approach is a systemic, objective method of discovery with empirical evidence and rigorous control. The research approach spells out the basic strategies that the researcher adopts to develop information that is accurate and interpretable. The control is achieved by holding condition constant and varying only the phenomena under study.

The research approach adopted for the present study was evaluative approach as the study aimed at development of an intervention (Health education) for assessing the knowledge of factory workers in Tirupati Balaji Minerals and Balaji Marbles of Udaipur city. This approach would help the investigator to evaluate the effect of specific

intervention that is "Health education" on the variable that is 'knowledge of factory workers regarding silicosis and its prevention" in selected granites factories of Udaipur city.

RESEARCH DESIGN

It is the overall plan for obtaining answer to the questions being studied and for handling some of the difficulties encountered during the research process.

The term 'research design' refers to the plan or organization of a scientific investigation. Research design helps the researcher in selection of subjects, manipulation of experimental variables, control of extraneous variables, procedure of data collection and the type of statistical analysis to be used to interpret the data. In the present study, Pre experimental one group pre test post test research design was selected for the study. The primary objectives of the study were to find the effectiveness of Health education.

The design chosen for the study is presented in the table as:

Group	Pre test	Intervention	Post test
	O_1	X	O_2

Table 1: Pre experimental one group pre test post test research design.

Key:

O_1 = Assessment of knowledge by pre test.
X = Health education on silicosis and its prevention among the workers of granite factories.
O_2 = Assessment of knowledge by post test.

RESEARCH SETTING

It refers to the physical location and conditions in which data collection takes place in the study. The present study has been conducted in Tirupati Balaji Minerals and Balaji Marbles of Udaipur.

The selection of the factory was done on the basis of:

- Geographical proximity
- Feasibility of conducting study
- Availability of sample

VARIABLES OF THE STUDY

1. Dependent variable:

Dependent variables are the response, behavior or outcome that is predicted on research. Changes in the dependent variable are presumed to be influenced by the independent variable. In this study the dependent variable is knowledge of granite factories workers regarding silicosis and its prevention.

2. Independent variable:

Independent variables are the cause or influence the dependent variable which is manipulated. In this study independent variable is health education regarding silicosis and its prevention.

3. Demographic variable:

The demographic variable confound the relationship between the independent and dependent variable and that need to be controlled either through building in research design or through statistical procedure. In this study the selected demographic variables are age, gender, educational status, monthly income of family, habit of cigarette smoking, working experiences, personal experience with silicosis, source of the about information.

POPULATION

Population refers to the entire aggregate of individuals or objects having common characteristics. In the present study the population consists of workers of selected granite factories of Udaipur city.

SAMPLING TECHNIQUE

Sample is used in research when it is not feasible to study the whole population from which it is drawn. The process of sampling makes it possible to accept a generalization to the intended population based on careful observation of variables, within a relatively small proportion of population. In the present study, purposive sampling technique was taken to select 120 workers of granite factories of Udaipur city.

SAMPLE AND SAMPLE SIZE

Sample consists of a subset of a population selected in a research study. The samples selected for the present study comprises of 120 workers of granite factories from Tirupati Balaji minerals and Balaji Marbles of Udaipur city.

SAMPLING CRITERIA

The following criteria are set to select the samples:

Inclusion Criteria

- Workers present at the time of data collection.
- Workers who are willing to participate in the study.
- Workers who can able to communicate either in Hindi or Mewari.

Exclusion Criteria

- Workers who are not available during the period of data collection.
- Workers who are already exposed to educational programme on silicosis and its prevention.

RESULTS

The description of the result is the eternity of a research project which enables the researcher to reduce, summarize, organize, evaluate, interpret and communicate numerical information.

In order to find a meaningful answer to the research problem, the data must be processed, analyzed in systemic and some orderly coherent fashion so that the pattern and relationship can be discerned. An

evaluative approach was adopted to assess the "A study to assess the effectiveness of health education on knowledge regarding silicosis and its prevention among the workers of selected granite factories of Udaipur city". The data was tabulated, analyzed and interpreted using descriptive and inferential statistics based on the objectives and hypothesis formulated for the present study.

PRESENTATION OF THE DATA

The collected data was entered in a master sheet for tabulation and statistical processing. The data is analyzed and interpreted using descriptive and inferential statistics based on the objectives and hypothesis formulated for the present study. The findings are presented under the following headings:

Section I: Description of demographic variables of respondents.

Section II: Findings related to knowledge scores of Respondents on silicosis and its prevention.

Part –I: Area wise pre test knowledge score of Respondents on silicosis and its prevention.

Part –II: Area wise post test knowledge score of Respondents on silicosis and its prevention.

Part –III: Effectiveness of Health education on silicosis and its prevention among Respondents.

Section III: Findings related to association between pre-test knowledge score and selected demographic variables of Respondents.

SECTION –II

FINDINGS RELATED TO AREA WISE OF KNOWLEDGE SCORES OF GRANITE FACTORY WORKERS REGARDING SILICOSIS AND ITS PREVENTION.

This section deals with analysis and interpretation of collected data to find out the knowledge scores of respondents before and after, giving the intervention on silicosis and its prevention.

Part I: Area wise pre test knowledge score of respondents on silicosis and its prevention.

Part II: Area wise post test knowledge score of respondents on silicosis and its prevention.

Part III: Effectiveness of Health education by comparing pre test and post test knowledge score of respondents.

Part – I

Table 2: Area wise pre test knowledge score of respondents on silicosis and its prevention. N=120

Area	Maximum score	Mean	Mean percentage	Standard deviation
Introduction of Respiration and Silicosis	7	1.85	26.42	0.48
Incidence and Prevalence of Silicosis	3	0.575	19.166	0.39
Causes, Sign and Symptoms of Silicosis	4	1.06	26.5	0.61
Prevention and Management of Silicosis	14	4.35	31.07	1.269
Total	**28**	**7.84**	**28**	**2.13**

Part-II

Table 3: Area wise post test knowledge score of Respondents regarding silicosis and its prevention. N=120

Area	Maximum score	Mean	Mean percentage	Standard deviation
Introduction of Respiration and Silicosis	7	6.15	87.85	0.74
Incidence and Prevalence of Silicosis	3	2.73	91	0.62
Causes, Sign and Symptoms of Silicosis	4	3.66	91.5	0.68
Prevention and Management of Silicosis	14	11.033	78.88	1.257
Total	**28**	**23.59**	**84.25**	**2.092**

Table 4: Distribution of Respondents by the level of knowledge. N=120

Level of knowledge	Score	Frequency		Percentage	
		Pre test	Post test	Pre test	Post test
Inadequate knowledge (0-50%)	0-13	113	00	94.16%	00%
Moderately adequate knowledge (50-75%)	14-20	07	09	5.84%	5.8%
Adequate knowledge (75-100%)	21-28	00	111	00%	94.20%
Total	**28**	**120**	**120**	**100%**	**100%**

Part III

Table 5: Effectiveness of health education by comparing pre test and post test knowledge score of respondents. N=120

	Mean	Mean Percentage (%)	SD	Enhancement	Enhancement percentage (%)	df	t-value	Inference
Pretest	7.84	28%	2.13	15.75	56.25	119	37.88	S
Post test	23.59	84.25	2.092					

SECTION III

FINDING RELATED TO ASSOCIATION BETWEEN PRE TEST KNOWLEDGE SCORES WITH SELECTED DEMOGRAPHIC VARIABLES.

This section deals with analysis and interpretation of the data collected to find out the association between pre test knowledge score with selected demographic variables like age in years, gender, educational status, monthly income of family, habit of cigarette smoking, working experiences, are you suffering with silicosis, knowledge regarding silicosis, if yes where you get the information.

A parametric chi square is used to describe the association between pre test knowledge score with selected demographic variables.

Table 6: Association between pre-test knowledge score with demographic variables such as Age in Year and Gender N=120

Variables	Below Median	Above median	Total	df	χ^2	P value (0.05)	Inference
1. Age in years							
a. 21-30 years	71	11	25	3	26.03	7.82	S
b. 31-40 years	23	02	35				
c. 41-50years	12	00	10				
d. > 50 years	02	00	10				
Total	**108**	**12**	**120**				
2. Gender							
a. Male	108	12	120	1	0.00	3.84	NS
b. Female	00	00	00				
Total	**108**	**12**	**120**				

S = Significant NS = Not Significant

Table 7: Association between pre-test knowledge score with demographic variables such as Education status and Monthly family income N=120

Variables	Below Median	Above median	Total	df	χ^2	P value (0.05)	Inference
3.Educational status							
No Formal	17	02	21	3	17.47	7.82	S
Primary	49	08	57				
Secondary	31	03	34				
Sin. Sec.	05	03	08				
Total	**104**	**16**	**120**				
4. Monthly family income							
a. Below 2001	18	05	23	3	16.34	7.82	S
b. 2001-5000	38	05	43				
c. 5001-8000	37	04	41				
d. Above 8001	12	01	13				
Total	**105**	**15**	**120**				

Table 8: Association between pre-test knowledge score with demographic variables such as working experience and habits of cigarette N=120

Variables	Below Median	Above median	Total	df	χ^2	P value (0.05)	Inference
5. Working experience							
a. 0-5 Years	49	05	54	3	19.32	7.82	S
b. 6-10 Years	46	07	53				
c. 11-15 Years	11	00	11				
d. 16-20 Years	02	00	02				
Total	**108**	**12**	**120**				
6. Habits of cigarette smoking							
e. Yes	44	18	62	1	5.22	3.84	S
f. No	51	07	58				
Total	**95**	**25**	**120**				

Table 9: Association between pre-test knowledge score with demographic variables such as personal experience with silicosis and any information regarding silicosis and its prevention N= 120

Variable	Below median	Above median	Total	df	χ^2	P value (0.05)	Inference
7. Are you suffering with silicosis							
Yes	00	00	00	1	0.00	3.84	NS
No	108	12	120				
Total	**108**	**12**	**120**				
8. Any information regarding silicosis							
Yes	01	04	05	1	28.51	3.84	S
No	107	08	115				
Total	**108**	**12**	**120**				

Table 11: Association between pre-test knowledge score with source of information. N=120

Variables	Below median	Above median	Total	df	χ^2	P value	Inference
9. Source of information							
Electronic media	0	0	0	3	9.81	7.82	S
Print media	0	3	3				
Family members	0	1	1				
Health personnel	0	1	1				
Total	**108**	**5**	**5**				

DISCUSSION

This chapter deals with the discussions in accordance with the objectives of the study and hypothesis. The present study has been undertaken to assess the effectiveness of health education on silicosis and its prevention among the workers of selected granite factories of Udaipur city.

The findings of the study are discussed under the following headings:

SECTION I: Description of demographic variables of respondents.

SECTION II: Assessment of pre test knowledge score of factory workers regarding silicosis and its prevention.

SECTION III: Assessment of post test knowledge score of factory workers regarding silicosis and its prevention.

SECTION IV: Effective of Health Education on knowledge of factory workers regarding silicosis and its prevention by comparing pre and post test knowledge scores.

SECTION V: Association between pre test knowledge score with selected demographic variables.

SECTION I

Description of Demographic variables of respondents

Age in years: The majority of the respondents i.e. 82 (66.33%) percent belongs to the age group of 20-30 years, 24 (20%) respondents to age group of 31-40years, 12 (10%) respondents belong to the age group of 41-50 years and 2 (1.67%) respondents percent belongs to the age group of > 50 years.

Gender: The majority of the respondents 100 (100%) were males and 0 respondents (0%) belongs to females.

Educational status: The majority of the respondents i.e. 57(47.5%) percent were primary education, 34

(28.33%) percent were secondary education, 21 (17.5%) percent were no formal education and 8 (6.67%) percent were senior secondary education.

Monthly family income: The majority of the respondents i.e. 43 (35.88%) percent belongs to the category of Rs2001 – 5000, 41 (34.16%) percent to the category of Rs5001- 8000, 23 (19.17%) percent to the category of < Rs2000 and 13 (10.84%) percent to the category of >Rs 8000.

Working experience: The majority of the respondents i.e. 54 (45 %) percent belongs to 0-5 years, 53 (44.16%) were belongs to 6-10 years of experience, 11(9.17 %) respondents belongs to 11-15 years and 02 (1.67%) belongs to 16-20 years of experience.

Habits of cigarette smoking: The majority of the respondents i.e.62 (51.67 %) percent belongs to smoker and 48.33% were not belongs to smoker.

Are you suffering with silicosis: The majority of the respondents i.e. 100(100 %) percent have not suffering with silicosis.

Do you have any information regarding silicosis: The majority of the respondents i.e. 115 (96%) percent have not knowledge regarding silicosis and 5(4%) have knowledge regarding silicosis.

Source of information: The majority of the respondents i.e. 3 (60%) were get information from print media, 20% were get information from friends and family and 20% were get information from health personnel.

SECTION II

Assessment of pre test knowledge score of granite factory workers regarding silicosis and its prevention.

The level of knowledge among granite factory workers regarding silicosis and its prevention was assessed in pre-test out of 120 respondents 94.16 % had inadequate knowledge, 5.84% granite factory workers had moderate knowledge and no granite factory workers had adequate knowledge on silicosis and its prevention.

Hence it was necessary for the investigator to improve the knowledge of respondents by giving health education of granite factory workers regarding silicosis and its prevention.

SECTION III

Assessment of post test knowledge score of granite factory workers regarding silicosis and its prevention.

The level of knowledge among granite factory workers regarding silicosis and its prevention were assessed that in post-test out of 120 respondents 94.2 % had adequate moderate knowledge and 5.8% had moderate knowledge. The overall mean of pre-test knowledge among granite factory workers regarding silicosis and its prevention was 7.84(28%) with standard deviation of 2.13 and mean of post-test was 23.59 (84.25%) with standard deviation of 2.09.

This revealed that the respondents had significantly higher knowledge after exposure to the health education.

SECTION IV

Effective of Health Education on knowledge of factory workers regarding silicosis and its prevention by comparing pre and post test knowledge scores.

The mean score of post test knowledge 23.59 (84.25%) was apparently higher than the mean score of pre-test knowledge 7.84(28%), suggesting that the health education Programme was effective in increasing the knowledge of the granite factory workers regarding silicosis and its prevention. The mean difference 15.75 between pre-test and post-test knowledge score of the granite factory workers was found to be significant.

The obtained "t" value 37.88 is greater than the table value at 0.05 level of significance. Therefore, "t" value is found to be significant. Hence it is inferred that there is significant difference between the pre test and post test knowledge scores of of factory workers regarding silicosis and its prevention and the health education is effective in improving the knowledge of factory workers. Hence research hypothesis ($H_{1)}$ is accepted.

SECTION V

Association between pre test knowledge score with selected demographic variables of granite factory workers regarding silicosis and its prevention.

The study also revealed that there is significant association between pre-test knowledge score of respondents demographic variables such as age in years (χ =26.03*), educational status (χ^2 = 17.32*), area of work experience (χ2= 19.32), monthly income of family (χ^2 = 16.34*), any information regarding silicosis (χ^2 = 28.51*) and source of information (χ^2 = 9.81*) Hence research hypothesis (H_2) is accepted at 0.05 level of significance.

The study revealed that there is not significant association between pre-test Knowledge score of respondents and demographic variables such as gender (χ2=0.00), habits of cigarette smoking (χ2= 5.22), are you suffering with silicosis (χ2= 0.00) and source of information (χ^2 = 9.81*). Hence the research hypothesis is rejected at 0.05 level of significance.

SUMMARY

This chapter deals with the summary of the study and its major findings along with implications and recommendations. The main objective of the study was to assess the effectiveness of health education on knowledge regarding silicosis and its prevention among the workers of selected granite factories of Udaipur city.

The literature review included a search for published and unpublished research, a manual search of recent literature, citation review of relevant primary and secondary articles. These literature provided information which enabled the investigator to study the extent of the selected problem, design, methodology, to develop the conceptual framework, development of tool, data analysis and for interpretation.

A framework is the overall conceptual underpinnings of the study. Every study has a framework. The conceptual framework used in the present study is based on Health promotion model (2002) by Nola j Pender and it provides the comprehensive framework for achieving the objectives of the study.

A study was conducted by using one group pre test post test design and non probability method was adopted to select the samples.

THE METHODS AND TOOLS USED IN COLLECTION OF DATA WERE:

Data was collected by administering structured knowledge questionnaire.

Structured knowledge questionnaire was developed consisting two parts that is:

PART I: It consists of 9 items on demographic variables.

PART II: It consists of 28 items regarding silicosis and its prevention. The selected aspects are:

Pilot study is a small preliminary investigation of the same general character of the main study. The main aim was to assess the feasibility, practicability and assessment of adequacy of measurement. The investigator conducted the pilot study in Padam Minerals, Udaipur. The sample size was 12. Written permission was obtained from the administrator of Padam Minerals. The purpose of the study was explained to samples prior to the study. The pre test questionnaire was administered on 08/03/2015 to assess the knowledge level of the granite factory workers regarding silicosis and its prevention. On 8/03/2015 the health education program was administered. Post test was done on 15/03/2015 with the same questionnaire to assess the knowledge level of granite factory workers regarding silicosis and its prevention.

The steps involved in the development of instruments are preparation of blue print, construction of items, content validity, pre-testing, reliability, conducting pilot study and preparation of the final copy of the tool. Content validity of the tool established 9 experts. A pilot study was conducted from 08-03-2015 to 15-03-2015, after obtaining formal permission from administrator of Padam Minerals, Udaipur. The reliability of the tool was established by using split half technique. The reliability of the tool was found reliable and feasible.

Non probability purposive sampling was used for selection of samples. The sample consists of 120 granite factory workers of Tirupati Balaji Minerals and Balaji Marble Udaipur. The data were categorized and analyzed by using descriptive and inferential statistics based on the objectives and hypothesis of the study.

The overall comparison of pre and post test knowledge scores of granite factory workers on silicosis and its prevention shows that the mean score of post test knowledge 23.59 (84.25 percent) was apparently higher than the mean score of pre-test knowledge 7.84 (28 percent), the enhancement in the knowledge level of respondents is 15.75 indicates gain in knowledge by respondents. The data further represent that the‘t’ value of 37.88 is significantly higher than the table value 1.96 at 0.05 level of significance. This indicates that there was significant difference in pre test and post test knowledge score of respondents and health education was effective in increasing the knowledge of the respondents regarding silicosis and its prevention**.** Hence research hypothesis (H_1) is accepted.

Association between pre test knowledge scores with selected demographic variables:

There is significant association between pre-test knowledge score of respondents demographic variables such as age in years (χ =26.03*), educational status (χ^2 =7.32*), area of working experience (χ2= 19.32), monthly income of family (χ^2 = 16.34*), do you have any information regarding silicosis (χ^2 = 28.51*) and source of information (χ^2 =9.81*). Hence the research hypothesis is accepted at 0.05 level of significance.

There is not significant association between pre-test Knowledge score of respondents and demographic variables such as gender (χ2=0.00), habits of cigarette smoking (χ2= 5.22), are you suffering with silicosis (χ2= 0.00) Hence research hypothesis is rejected at 0.05 level of significance.

The present study was done to assess the effectiveness of health education on knowledge regarding silicosis and its prevention among the workers of selected granite factories in Tirupati balaji minerals and Balaji green marbles at Udaipur During pre test, most of the respondents showed inadequate knowledge of mean percentage of 28 and the maximum number of respondents has adequate knowledge in post test as evidenced by the overall mean percentage of 84.25. There has been significant improvement in the level of knowledge of granite factory workers which indicates that the health education was effective.

CONCLUSION

This chapter deals with the implications, recommendations and limitations of the study "A study to assess the effectiveness of health education on knowledge regarding silicosis and its prevention among the workers of selected granite factories of Udaipur city".

Pre test knowledge score of granite factory workers regarding silicosis and its prevention.

The findings shows that in pre test the maximum mean percent obtained by the respondents were 28 percent with SD of 2.13 which shows that the respondents have inadequate knowledge regarding silicosis and its prevention among granite factory workers.

Hence it is necessary for the investigator to improve the knowledge of respondents by giving health education about silicosis and its prevention.

Post test knowledge score of granite factory workers regarding silicosis and its prevention.

The finding shows that in post test the maximum mean percent obtained by the

Respondents are 84.25% with SD of 2.09which shows a gain in knowledge level of

The respondents.

Effective of Health Education on knowledge of factory workers regarding silicosis and its prevention by comparing pre and post test knowledge scores.

The overall comparison of pre and post test knowledge scores on silicosis and its prevention shows that the mean post test knowledge score is 23.59 (84.25%) is greater than the mean pre test knowledge score 7.84 (28 %). The enhancement in the knowledge level of respondents is 15.75 indicates gain in knowledge by respondents. The data further represent that the't' value of 37.88 is significantly higher than the table value 1.96 at 0.05 level of significance. This indicates that there was significant difference in pre test and post test knowledge score of respondents and health education Program is effective in improving the knowledge level of granite factory workers on silicosis and its prevention. Hence research hypothesis (H_1) is accepted.

Association between pre test knowledge score with selected demographic variables of granite factory workers regarding silicosis and its prevention.

There is significant association between pre-test knowledge score of respondents demographic variables such as age in years (χ =26.03*), educational status (χ^2 =7.32*), area of work experience (χ2= 19.32), monthly income of family (χ^2 = 16.34*), knowledge regarding silicosis (χ^2 = 28.51*). Hence the research hypothesis is accepted at 0.05 level of significance.

There is no significant association between pre-test Knowledge score of respondents and demographic variables such as gender (χ2=0.00), habits of cigarette smoking (χ2= 5.22), are you suffering with silicosis (χ2= 0.00) and source of information (χ^2 =4*) Hence research hypothesis is rejected at 0.05 level of significance.

The present study was done to assess the effectiveness of health education on knowledge regarding silicosis and its prevention among the workers of selected granite factories in Tirupati balaji minerals and Balaji green marbles at Udaipur During pre test, most of the respondents showed inadequate knowledge of mean percentage of 28 and the maximum number of respondents has adequate knowledge in post test as evidenced by the overall mean percentage of 84.25. There has been significant improvement in the level of knowledge of granite factory workers which indicates that the health education was effective.

NURSING IMPLICATIONS:

The findings of the study have implication in the areas of nursing education, practice, administration and research:

1. Nursing practice
2. Nursing education
3. Nursing Administration
4. Nursing research

IMPLICATIONS FOR NURSING PRACTICE:

The role of nurses in the health care industry is a vital aspect in society. They shoulder the responsibility of promoting health, preventing illness and rehabilitation. Many patients in hospital are at increased risk of silicosis, and it is therefore important for nurses to understand the condition and how to recognize it. In the Nursing practice the education about the silicosis and its prevention helps

for the integration of overall health care into intensive health care.

IMPLICATION FOR NURSING EDUCATION:

Nursing education plays an important role in preparing the nurse for the wellbeing of the people. Nursing educators have the responsibility of equipping the students with adequate knowledge so that the latter can provide quality care. Facts taught to nursing students should be accurate, up-date and periodically refreshed with the latest trends and practices in every aspects of nursing so that they could bring forth a confident and well qualified bunch of professionals. Hence to achieve the above objectives, educational program should include lecture, skilled, demonstration, computer assisted instruction and simulated environment which will provide to the nurses in additional knowledge and learning opportunities. Nursing Schools, Colleges and teachers should come forward and encourage the students to provide health education on silicosis and its prevention among granite factory workers.

IMPLICATION FOR NURSING ADMINISTRATION:

Administration plays a major role in regulating and coordinating the laws. The quality of an administrator is determined by the quality of her subordinates. A nursing administrator has a significant role in encouraging and motivating the nurses to improve their knowledge in order to keep in pace with the changing needs of the society. Nurse administrator needs to encourage and plan for staff development program related to silicosis and its prevention among granite factory workers to increase the nurses' knowledge and they become skilled. The implication of silicosis and its prevention of among granite factory workers enhance the quality assurance.

IMPLICATION FOR NURSING RESEARCH:

The essence of research is to build a body of knowledge in nursing as it is an evolving profession. The findings of the present study serve as the basis for the professionals and the students to conduct further studies. The generalization of the study result can be made by replication of the study. In India only a few research studies have been done on assessment of knowledge of granite factory workers regarding silicosis and its prevention. All nursing personnel must join hands to provide scientifically listed materials of programme to evolve a time bound plan for the most good knowledge and safety practices.

LIMITATIONS OF THE STUDY:

- The study was limited to the assessment of knowledge of granite factory workers on silicosis and its prevention.
- The study was limited to granite factory workers who are working in granite factories.
- The sample was limited to 120 only.
- The data were collected by using non probability method.

RECOMMENDATIONS:

- A similar study can be undertaken with a large sample to generalize the result.
- A comparative study on knowledge of granite factory workers on silicosis and its prevention can be undertaken.
- A health education programme can be developed based on the knowledge of granite factory workers on silicosis and its prevention.
- Specific protocol should be developed for granite factory workers on the silicosis and its prevention.

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