"Effect Of Advanced Teaching Program On Knowledge Regarding Prevention Of Silicosis Among Mines Workers In Selected Mines Of Rajsamand''

Radheshyam Menaria[1*],

[1*]Principal, Mewar girls institute of nursing, Rajsamand

***Corresponding Author:** Radheshyam Menaria
*Principal, Mewar girls institute of nursing, Rajsamand

Abstract
The present study has been undertaken to assess knowledge score regarding prevention of silicosis among peoples by advanced teaching program Dariba at Rajsamand. The research design adopted for the study was pre- experimental in nature. The tool for the study was self-structured knowledge questionnaire which consists of two parts-PART- I consisted questions related to Socio-demographic data; PART-II consisted of self -structured knowledge questionnaire to assess the knowledge score regarding prevention of silicosis among mines workers. The data was analyzed by using descriptive and inferential statistical methods. The most significant finding was that 83.3% of mines workers were having average knowledge regarding prevention of silicosis whereas 16.7% had good knowledge after post-test. It was suggested that the nurses must educate mines workers regarding prevention of silicosis.

Keyword- Effect, advanced teaching program, knowledge and prevention of silicosis.

1. INTRODUCTION

Silicosis is a potentially fatal, irreversible, fibrotic pulmonary disease that may develop subsequent to the inhalation of large amounts of silica dust over time. In most circumstances, silicosis only develops subsequent to substantial genderal exposures. The disease has a long latency period and may clinically present as an acute, accelerated, or chronic disease. The pathophysiology of chronic silicosis involves chronic inflammation arising as a result of the accumulation of various inflammatory mediators and fibrogenic factors. Under the influence of these factors, pulmonary silicoproteinosis develops as eosinophilic proteinaceous material accumulates in the pulmonary alveolar spaces. The rate of disease progression appears to depend upon the rate of silica deposition in the lungs, as well as the total amount of crystalline silica that is actually retained in the lung. In some cases, silicosis may be associated with the concomitant development of other diseases, including tuberculosis, cancer, or autoimmune disease. Currently, no cure or effective treatment is available for silicosis.

2. NEED FOR STUDY

In 2019, global ASRs for silicosis prevalence, incidence, mortality, and DALYs were 5.383, 1.650, 0.161, and 7.872%, respectively which are lower than that in 1990. The populations of 45–59 age group were more susceptible to silicosis, while those aged 80 or above suffered from higher mortality and DALY risks. In 2019, the most impacted nations by the burden of silicosis included China, the Democratic People's Republic of Korea, and Chile. From 1990 to 2019, most regions observed a declining burden of silicosis. An "M" shaped association between SDI and ASRs of DALYs for silicosis was observed from 1990 to 2019. The age-period-cohort analysis forecasted a decreasing trend of the burden of silicosis from 2019 to 2044.

3. OBJECTIVE OF THE STUDY

1. To assess the pre-test and post-test Knowledge score regarding prevention of silicosis among mines workers.
2. To assess the effectiveness of advanced teaching program on knowledge regarding prevention of silicosis among mines workers.
3. To find out the association between the pre-test knowledge score regarding prevention of silicosis among mines workers with their selected demographic variables.

4. HYPOTHESES:

RH_0: There will be no significant difference between pretest and post-test knowledge score on prevention of silicosis among mines workers.

RH_1: There will be significant difference between pretest and post-test knowledge score on prevention of silicosis among mines workers.

RH_2: There will be significant association between the pre-test score on prevention of silicosis among mines workers with their selected demographic variables.

5. ASSUMPTION

1. Mines workers may have deficit knowledge regarding prevention of silicosis.
2. Advanced teaching program will improve knowledge of mines workers regarding prevention of silicosis.

6. METHODOLOGY:

An evaluative approach was used and research design pre-experimental one group pre-test post-test research design was used for the study. The samples consisted of 30 mines workers selected by Non probability convenient sampling technique. The setting for the study was Dariba at Rajsamand. Data was collected with the help of demographic variables and administering a self-structured knowledge questionnaire by the investigator before and after advanced teaching program. Post-test was conducted after 7 days of pretest. Data were analysis using descriptive & inferential statistics.

7. ANALYSIS AND INTERPRETATION

SECTION-I Table -1 Frequency and percentage distribution of samples according to their demographic variables.

n = 30

S. No	Demographic Variables	Frequency	Percentage
1	**Age in Years**		
a.	21-25	5	16.7
b.	26-30	5	16.7
c.	31-35	10	33.3
d.	≥35	10	33.3
2	**Gender**		
a.	Male	21	70.0
b.	Female	9	30.0
3	**Family Monthly income**		
a.	<10000/-	3	10.0
b.	10001-15000/-	17	56.7
c.	15001-20000/-	5	16.7
d.	>20000/-	5	16.7
4	**Educational status**		
a.	No formal education	12	40.0
b	Primary	14	46.7
c	Higher secondary	4	13.3
d.	UG and above	0	0.0
5	**Living area**		
a.	Rural	19	63.3
b	Urban	11	36.7

SECTION-II- Table- 2.1.1- Frequency and percentage distribution of Pre-test scores of studied subjects:

Category and test Score	Frequency (N=30)	Frequency Percentage (%)
POOR (1-10)	23	76.7
AVERAGE (11-20)	7	23.3
GOOD (21-30)	0	0.0
TOTAL	30	100.0

The present table 2.1.1 concerned with the existing knowledge regarding prevention of silicosis among mines workers was shown by pre-test score and it is observed that most of the mine's workers 23 (76.7%) were poor (1-10) knowledge and some mines workers have 7 (23.3%) average categories.

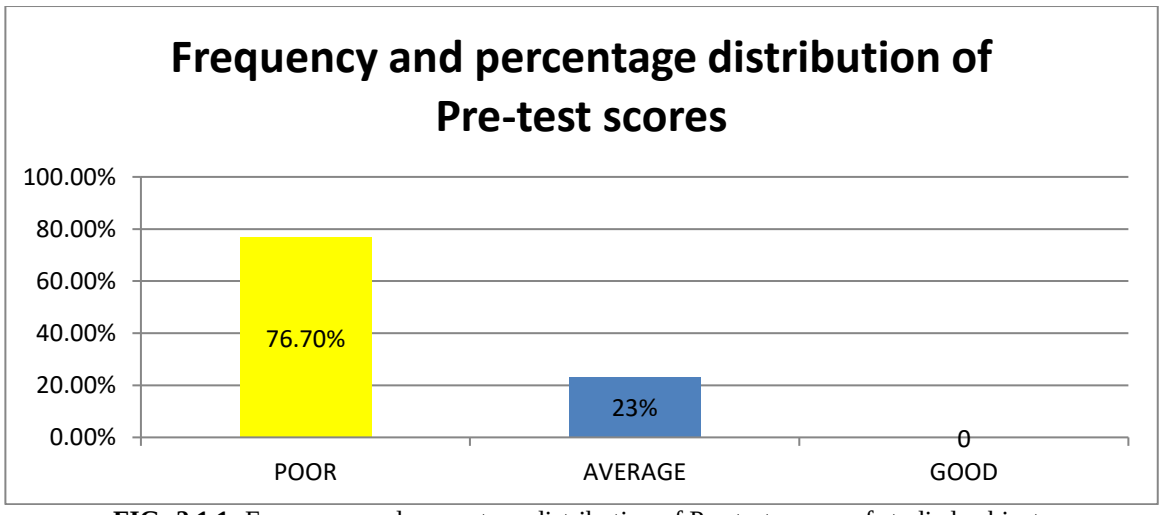

FIG.-2.1.1- Frequency and percentage distribution of Pre-test scores of studied subjects

Table-2.1.2. - Mean ($\overline{X}$) and standard Deviation (s) of knowledge scores:

Knowledge Pre –test	**Mean ($\overline{X}$)**	**Std Dev (S)**
Pre-test score	8.90	2.15

The information regarding mean, percentage of mean and standard deviation of test scores in shown in table 2.1.2 knowledge in mean pre-test score was 8.90 ± 2.15 while in knowledge regarding prevention of silicosis among mine's workers in Dariba at Rajsamand.

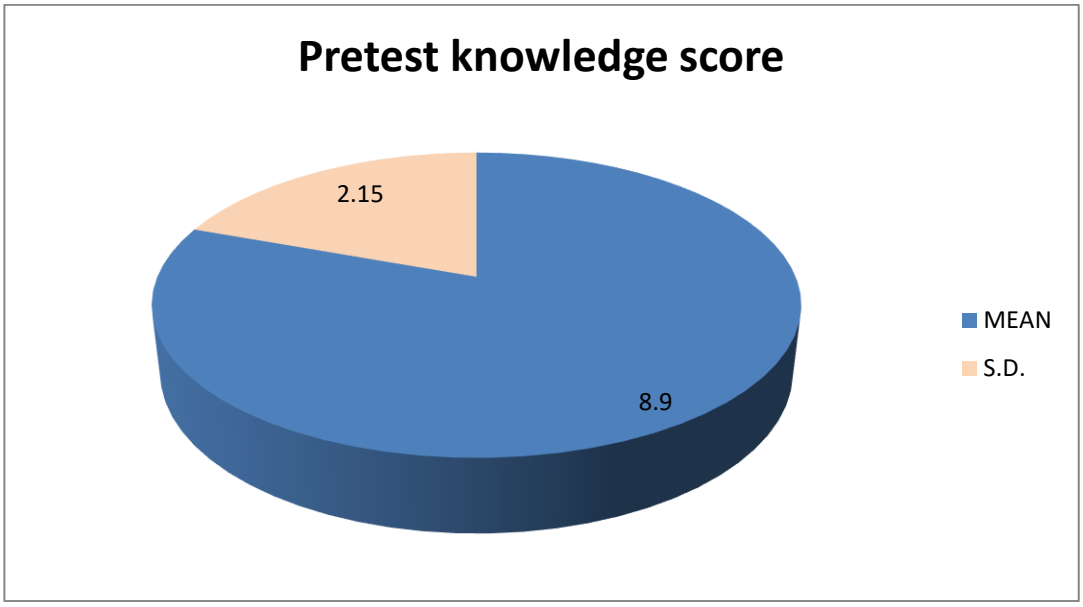

FIG.-2.1.1. - Mean ($\overline{X}$) and standard Deviation (s) of knowledge scores

Table-2.2.1- Frequency and percentage distribution of Post test scores of studied subjects:

Category and post-test Score	**Frequency (N=30)**	**Frequency Percentage (%)**
POOR (1-10)	0	0.0
AVERAGE (11-20)	25	83.3
GOOD (21-30)	5	16.7
TOTAL	30	100%

The present table 2.2.1 concerned with the existing knowledge regarding prevention of silicosis among mines workers was shown by post test score and it is observed that mines workers 5 (16.7%) were **GOOD** (21-30) knowledge and other mines workers have 25 (83.3%) category which are **AVERAGE** (11-20) posttest knowledge score in the present study.

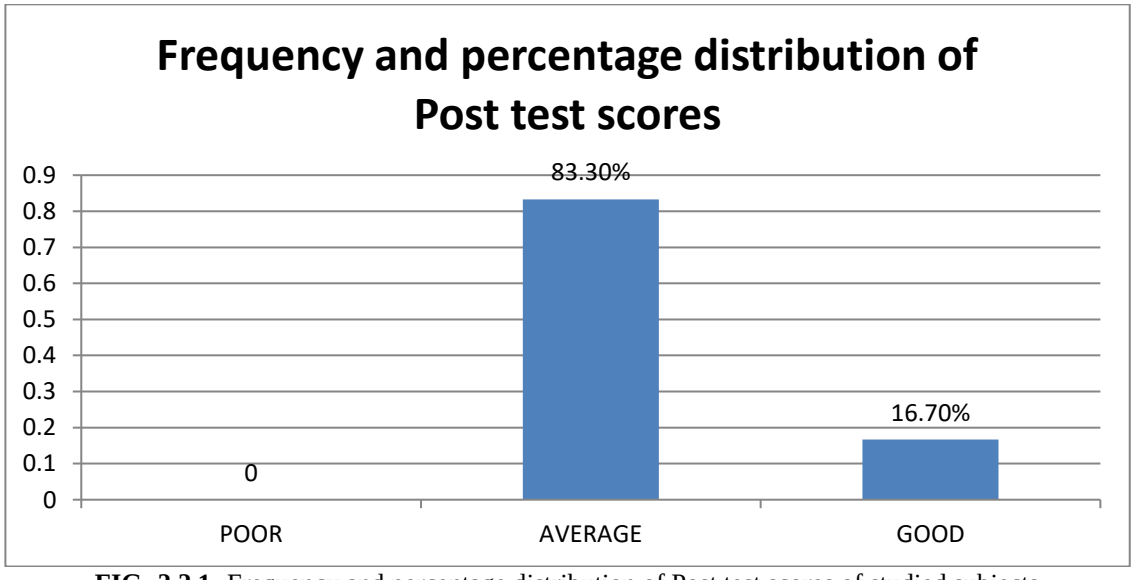

FIG.-2.2.1- Frequency and percentage distribution of Post test scores of studied subjects

Table-2.2.2. - Mean ($\overline{X}$) and standard Deviation (s) of knowledge scores:

Knowledge Test	**Mean ($\overline{X}$)**	**Std Dev (S)**
Post-test score	18.83	2.33

The information regarding mean, percentage of mean and standard deviation of post test scores in shown in table 2.2.2 knowledge in mean post test score was 18.83 ± 2.33 while in knowledge regarding prevention of silicosis among mine's wokers in Dariba At Rajsamand.

Hence, it is confirmed from the tables of section-II that there is a significant difference in mean of test scores which partially fulfill the first second objective of the present study.

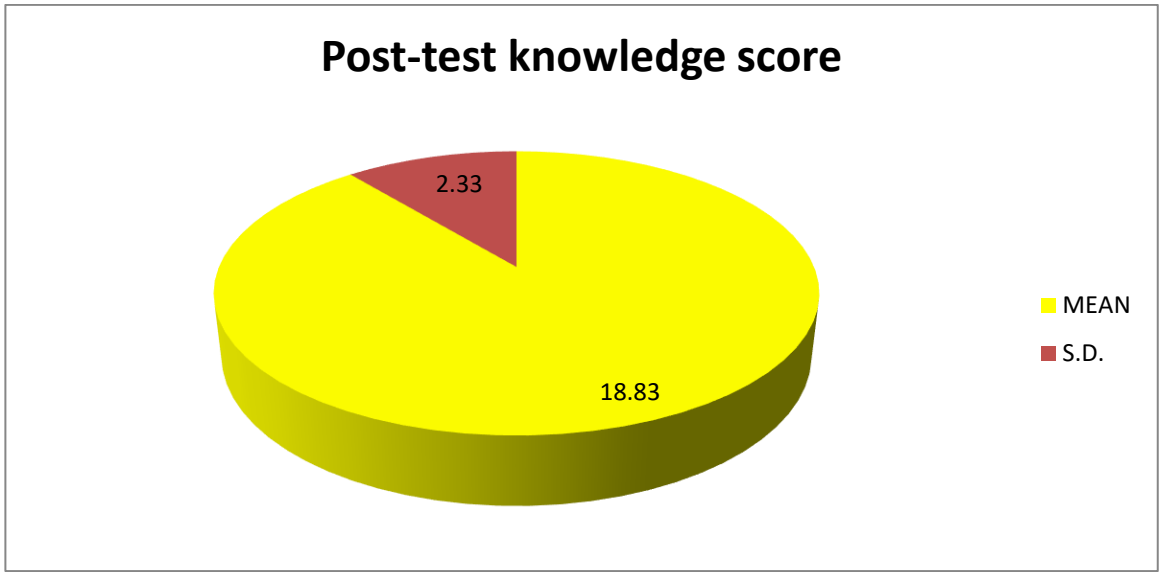

FIG.-2.2.2. - Mean ($\overline{X}$) and standard Deviation (s) of knowledge scores:

TABLE 2.2.3: Effectiveness of awareness package by calculating Mean, SD, Mean Difference and 't' Value of Pre-test and Post-test knowledge.

Knowledge Score of Mines workers	**Mean ($\overline{X}$)**	**S. D. (s)**	**Std. Error of Mean**	**D. F.**	**t-value**	**Significance**
Pre-test	**8.90**	**2.15**	0.50	29	**-19.85**	P<0.05
Post-test	**18.83**	**2.33**				

When the mean and SD of pre-test and post-test were compared and't' test was applied. It can be clearly seen that the't' value was -19.85 and p value was <0.05 which clearly show that advanced teaching program was very effective in increasing the knowledge of mines workers.

SECTION-III Association of knowledge scores between test and selected demographic variables:

Table- 3.1 Association of age with pre-test scores:

Age	**Test scores**			**Total**
(in years)	**POOR (1-10)**	**AVERAGE (11-20)**	**GOOD (21-30)**	
21-25	4	1	0	**5**
26-30	4	1	0	**5**
31-35	9	1	0	**10**
>35	6	4	0	**10**
Total	**23**	**7**	**0**	**30**
X=2.60	p>0.05(Insignificant)			

The association of age test scores is shown in present table 3.1. The probability value for Chi-Square test is 2.60 for 3 degrees of freedom which indicated a insignificant valve (p>0.05). Hence, it is identified that there is a insignificant association between age and test scores. Moreover, it is reflected that age isn't influenced with the present problem.

Table- 3.2 Association of family monthly income with pre-test scores:

Family Monthly Income	**Test scores**			**Total**
	POOR (1-10)	**AVERAGE(11-20)**	**GOOD (21-30)**	
<10000/-	2	1	0	**3**
10001-13000	16	1	0	**17**
13001-20000	3	2	0	**5**
>20000/-	2	3	0	**5**
Total	**23**	**7**	**0**	**30**
X= 7.59 p>0.05 (Insignificant)				

The association of family monthly income and test scores is shown in present table 3.2. The probability value for Chi-Square test is 7.59 for 3 degrees of freedom which indicated a insignificant value (p>0.05). Hence, it is identified that there is a insignificant association between monthly income and test scores.

Table-3.3. Association of educational status with pre-test scores:

Educational status	**Test scores**			**Total**
CLASS	**POOR (1-10)**	**AVERAGE (11-20)**	**GOOD (21-30)**	
No formal	10	2	0	**12**
Primary	11	3	0	**14**
Higher sec	2	2	0	**4**
Ug & above	0	0	0	**0**
Total	**23**	**7**	**0**	**30**
X=1.91 p>0.05 (Insignificant)				

The association of educational status test scores is shown in present table 3.3. The probability value for Chi-Square test is 1.91 for 3 degrees of freedom which indicated a insignificant valve (p>0.05). Hence, it is identified that there is a insignificant association between educational status and test scores. Moreover, it is reflected that educational status isn't influenced with the present problem.

Table- 3.4 Association of gender with pre-test scores:

Gender	**Test scores**			**Total**
CLASS	**POOR (1-10)**	**AVERAGE (11-20)**	**GOOD (21-30)**	
Male	17	4	0	**21**
Female	6	3	0	**9**
Total	**23**	**7**	**0**	**30**
X= 0.71 p>0.05 (Insignificant)				

The association of gender & test scores is shown in present table 3.4. The probability value for Chi-Square test is 0.71 for 1 degrees of freedom which indicated gender and test scores. Hence, it is identified that there is a insignificant association between gender and test scores. Moreover, it is reflected that gender gender isn't influenced with the present problem.

Table- 3.5 Association of Living area with pre-test scores:

Living area	**Test scores**			**Total**
CLASS	**POOR (1-10)**	**AVERAGE (11-20)**	**GOOD (21-30)**	
Male	14	5	0	**19**
Female	9	2	0	**11**
Total	**23**	**7**	**0**	**30**
X= 0.25 p>0.05 (Insignificant)				

The association of **Living area &** test scores is shown in present table 3.4. The probability value for Chi-Square test is 0.25 for 1 degrees of freedom which indicated **Living area** and test scores. Hence, it is identified that there is a insignificant association between gender and test scores. Moreover, it is reflected that **Living area** isn't influenced with the present problem.

8. RESULTS

The result of this study indicates that there was a significant increase in the post-test knowledge scores compared to pre-test scores of preventions of silicosis. The mean percentage knowledge score was observed 8.90 ± 2.15 in the pre-test and after implementation of advanced teaching program post-test mean percentage was observed with 18.83 ± 2.33.

9. CONCLUSION

Thus, after the analysis and interpretation of data we can conclude that the hypothesis RH1 that, there will be significance difference between the pre-test knowledge score with post-test knowledge score at the ($P<0.05$) is being accepted.

Furthermore, advanced teaching program regarding prevention of silicosis among mines workers may consider as an effective tool when there is a need in lacking, bridging and modifying the knowledge.

10. LIMITATIONS-

- The study was limited to Dariba mines of Rajsamand.
- The study was limited to 30 mines workers.

11. REFERENCE-

1. Frankel A , Blake L , Yates D . Complicated silicosis in an Australian worker from cutting engineered stone countertops: an embarrassing first for Australia. Eur Respir J 2015;46:PA1144. doi:10.1183/13993003.congress-2015.PA1144 Google Scholar
2. Hoy RF , Sim MR . Correspondence on 'demographic, exposure and clinical characteristics in a multinational Registry of engineered stone workers with Silicosis' by Hua et Al. Occup Environ Med 2022;79:647–8. doi:10.1136/oemed-2022-108496 FREE Full TextGoogle Scholar
3. Hoy RF , Baird T , Hammerschlag G , et al . Artificial stone-associated silicosis: a rapidly emerging occupational lung disease. Occup Environ Med 2018;75:3–5. doi:10.1136/oemed-2017-104428 Abstract/FREE Full TextGoogle Scholar
4. León-Jiménez A , Hidalgo-Molina A , Conde-Sánchez MÁ , et al . Artificial stone silicosis: rapid progression following exposure cessation. Chest 2020;158:1060–8. doi:10.1016/j.chest.2020.03.026 PubMedGoogle Scholar
5. Wu N , Xue C , Yu S , et al . Artificial stone-associated silicosis in China: a prospective comparison with natural stone-associated silicosis. Respirology 2020;25:518–24. doi:10.1111/resp.13744 CrossRefPubMedGoogle Scholar
6. Hua JT , Zell-Baran L , Go LHT , et al . Demographic, exposure and clinical characteristics in a multinational registry of engineered stone workers with silicosis. Occup Environ Med 2022;79:849–50. doi:10.1136/oemed-2022-108512 FREE Full TextGoogle Scholar
7. Rose C , Heinzerling A , Patel K , et al . Severe silicosis in engineered stone fabrication workers - California, Colorado, Texas, and Washington, 2017-2019. MMWR Morb Mortal Wkly Rep 2019;68:813–8. doi:10.15585/mmwr.mm6838a1 PubMedGoogle Scholar