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Effectiveness of planned teaching programme on respiratory status among marble factory workers

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Abstract
Occupational respiratory status occurs in the workers exposed to occupation related hazards. These include Asthma, COPD, Coal workers pneumoconiosis, Silicosis, Asbestosis. Marble workers are occupationally exposed to intense environmental marble dust in their work place. Hence the present study aimed to assess the effectiveness of respiratory status among marble factory workers in selected factories of marble workers. The research design for the study is quasi experimental (pre-test and post – test with control group) design Non probability convenience sampling technique was used to select samples. Structured interview schedule which was divided into two sections demographic variables, structured knowledge questionnaire for assessing the knowledge of marble factory workers regarding respiratory status after assessing the knowledge of marble factory workers a planned teaching programme was given on the same day. A post –test was conducted on after 2 two days after the planned teaching programme to find out the gain in knowledge among marble factory workers regarding respiratory status. The mean score of experimental group for post-test knowledge score was 25.77%, the mean score of control group for post-test knowledge score was 16.20% was apparently higher than the mean score of experimental group for pre -test knowledge score was 16.20% the mean score of control group for pre-test knowledge score was 16.00% suggesting that the planned teaching programme was effective in increasing knowledge of marble factory workers regarding occupational respiratory status. The mean differences 9.77 between pre-test and post-test knowledge score of the marble factory workers was to be found the calculated student independent 't' test valve of t=13.014 was found to be statistically significant at $p<0.001$ level. Chi-square test to associate the level of knowledge at selected demographic variable.

Keywords: Effectiveness, planned teaching programme, occupational respiratory status, and Marble factory workers

Introduction
Occupational health is a multidisciplinary activity aimed at the protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and safe work, work environment and work organizations. Occupational health was gradually developed from a mono -disciplinary risk oriented activity to a multi-disciplinary and comprehensive approach that considers an individual physical, mental, and social well- being general health and personal development [1].
Occupational Respiratory disease are occupational diseases affecting the respiratory system, including occupational asthma, black lung disease (Coal worker's pneumoconiosis), chronic obstructive pulmonary disease (COPD), mesothelioma, and silicosis. Exposure to substances like flock and silica can cause fibro sing lung diseases, whereas exposure to carcinogens like asbestos and beryllium can cause lung cancer. Marble used in the sculpturing of statues and the construction of buildings and monuments is a metamorphic limestone. Persons employed in carving statues from stones, and marble rocks are exposed to the dust containing particles of calcium carbonate and silica. Complains including respiratory systems like coughing, shortness of breath, chest pain, chest tightness, abnormal breathing pattern are frequent with these workers occupational lung disease, like other lung diseases, like other lung diseases, usually require an initial chest x-ray or CT scan for a clinical diagnosis [2].
Asbestosis related diseases remain some of the commonest cause of mortality and morbidity of workers exposed to occupational hazards worldwide. Asbestosis, a building material used widely low-income countries is the most important occupational cause of respiratory tract

cancers; is effectively the sole cause of malignant mesothelioma; is an important and probably under-recognized[3] cause of pulmonary fibrosis (asbestosis) and is sometimes the cause of debilitating pleural disease. Despite its well- known toxic effects, approximately 125 million people in the world are currently exposed to asbestos at work.[3]An even larger number of people of people have had substantial exposure in the past and continue to be risk of one of the several, long latency, asbestos-related respiratory disease. Although more than 50 countries, including those of the European Union, Australia, South Africa and Japan, have completely banned the use of asbestos [4].

The term work-related asthma refers to patients whose disease is either caused or exacerbated by agents present in their workplace.[5]when the relationship is directly causal, the condition is termed occupational asthma. Occupational asthma can results from an allergic response to a specific workplace sensitizer (known as immunological asthma) or from exposure to a toxic concentration of an irritant agent (known as irritant induced occupational asthma or reactive airways dysfunction syndrome).[5,6]there is increasing interest in whether persistent exposure to low concentration of respiratory irritants might also induce occupational asthma [7].

Coal worker's pneumoconiosis is still a major concern in industrially developing countries and in some long-industrialized countries such as the USA. As with silica- an important co-exposures in some coal miners the prevention of diseases from the coal mine dust is achieved through a comprehensive program of dust control and health surveillance.[8]there is a good evidence that risks of pneumoconiosis in coal miners are determined by their cumulative exposure to coal mine dust, and are modified according to the composition of dust [9].

The epidemiological evidence supporting the occupational contribution of exposure to a wide variety of workplace dusts, fumes, or gases to the causation of COPD continues to accrue [10]. The extent of confounding by other socioeconomic determinants of lung function, the causal contribution of smoking, and the absence of any clear relationship between exposure and risk make it difficult to translate this evidence into a preventive strategy, beyond a call to minimize irritant exposures at work and initiatives to promote smoking cessation. There are some important specific exceptions-notably exposures to coalmine dust and silica-for which the risks are clearly established and, in the case of coal mine dust at least, are independent of smoking.[11] Additionally, collaborative bronchiolitis, which is often misdiagnosed as COPD, has been described in association with the inhalation of gases, Toxic fumes, or irritants such as nitrogen dioxide, chlorine gas, and mustard gas. On the basis of its clinical features, COPD related to occupation cannot, at an individual level, be distinguished from the same disease arising from other causes. This fact complicates workplace health surveillance; the potential benefits of lung function measurements in COPD surveillance, for example, should be balanced against the risks and costs of misattributing changes in lung function that are unrelated to work.

The worldwide incidence of pneumoconiosis and other occupational chronic respiratory diseases have been estimated at 453,000 and 2,631,000 cases per year, respectively. In recent estimates from India more than 3 million workers exposed to silica dust, whilst 8.5 million more work in construction and building activities, similarly exposed to quartz. several recent reports on lung function assessment show both restrictive and obstructive patterns .The reaction of the lung to mineral dust depends on many variable, including size, shape, solubility, and reactivity of the particles. For example particles greater than 5 to 10 are unlikely to reach move into and out of alveoli, often without substantial deposition and injury particle that are 1 to 5 m in diameter are the most dangerous, because they get lodged at the bifurcation of the distal airways.

Methods and Materials

The research design for the study is quasi experimental (pre-test and post –test with control group) research design was used to conduct the study in marble factory of madhuravoyal Chennai city 60 samples were selected by using Non-probability convenience sampling technique. The criteria for sample selection are marble workers who are available at the time of data collection, marble workers who are below 20 years. Marble workers who are willing to participate in the study the exclusion criteria for the samples are marble workers who are not willing to participate marble workers who are not available at the time of data collection. The data collection period was done with prior permission from the manager Director of marble world factory, madhuravoyal Chennai city. And ethical clearance was obtained from the institution. The purpose of the study was explained to the samples with written informed consent was obtained from the institution. Structured interview schedule which was divided into two sections demographic variables, structured knowledge questionnaire for assessing the knowledge of marble factory workers regarding respiratory status after assessing the knowledge of marble factory workers a planned teaching programme was given on the same day. A post –test was conducted on after 2 two days after the planned teaching programme to find out the gain in knowledge among marble factory workers regarding respiratory status. The data were analysed using descriptive and inferential statistics. The sample characteristics were described using frequency and percentage. Person's co-relation coefficient was used to assess the effectiveness of respiratory status in the experimental group. Chi square was used to associate the post-test level of knowledge with the selected demographic variable.

Results and Discussion

The sample characteristics are in the experimental group, most of them 10(33.3%) were in the age group of 20 to 25 and 26 to 30 years respectively, 15(50%) were Hindus, 13(43.4%) had primary education, 15(50%) had an income of 5000 to 10000, 16(53.3%) were married, 16(53.3%) belonged to joint family, 15(50%) were speaking Tamil and Hindi language respectively, 12(40%) were working for 3 years, 10(33.3%) were residing in rural, semi urban and urban area respectively and 10(33.3%) had the habit of alcohol and smoking respectively. Whereas 30 samples in the control group, most of the them 18(60%) were in the age group of 20 to 25 years, 20(66.6%) were Hindus, 12(40%) were uneducated, 20(66.6%) had an income of 5000 to 10000, 19(63.3%) were married, 16(53.3%) belonged to nuclear family 20(66.7%) were speaking Tamil language, 9(30%) were working for 3 years, 10(33.3%) were residing in rural, semi urban and urban area respectively and 15(50%) had no habits.

Table 2: Frequency and percentage distribution of pre-test and post- test level of knowledge regarding occupational respiratory status among Marble Factory Workers in the experimental and control group.

N = 60(30+30)

Group	Test	Inadequate (≤50%)		Moderately Adequate (51 – 75%)		Adequate (>75%)	
		No.	%	No.	%	No.	%
Experimental Group	Pre-test	10	33.33	20	66.67	0	0
	Post Test	0	0	5	16.67	25	83.33
Control Group	Pre-test	13	43.33	17	56.67	0	0
	Post Test	12	40.0	18	60.0	0	0

The table 2 shows that in the pre-test of experimental group, 20(66.67%) had moderately adequate knowledge and 10(33.33%) had inadequate knowledge regarding occupational respiratory status. Whereas in the post test, 25(83.33%) had adequate knowledge and 5(1.67%) had moderately adequate knowledge.

The table also depicts that in the pre-test of control group, 17(56.67%) had moderately adequate knowledge and 13(43.33%) had inadequate knowledge. Whereas in the post-test 18(60%) had moderately adequate knowledge and 12(40%) had inadequate knowledge.

Table 3: Effectiveness of planned teaching programme regarding knowledge on respiratory status among Marble Factory Workers in the experimental group

n = 30

Variables	Test	Mean	S.D	Paired 't' Test Value
Knowledge	Pre-test	16.20	3.16	t = 15.272
	Post Test	25.77	2.54	p = 0.0001
				S***

***p<0.001, S – Significant

The table 3 portrays that the pre-test mean score of knowledge among Marble Factory Workers was 16.20±3.16 and the post-test mean score was 25.77±2.54. The calculated paired't' test value of t = 15.272 was found to be statistically highly significant at p<0.001 level.

The above finding clearly infers that planned teaching programme administered to Marble Factory Workers had significant effect which resulted in the improvement in the level of knowledge regarding occupational respiratory status among Marble Factory Workers in the experimental group

Table 4: Comparison of pre-test and post -test level of knowledge regarding respiratory status among Marble Factory Workers in the control group.

n = 30

Variables	Test	Mean	S.D	Paired 't' Test Value
Knowledge	Pre-test	16.0	3.23	t = 1.989
	Post Test	16.20	3.12	p = 0.056
				N.S

N.S – Not Significant

The table 4 shows that the pre-test mean score of knowledge among Marble Factory Workers was 16.0±3.23 and the post -test mean score was 16.20±3.12. The calculated paired t' test value of t = 1.989 was not found to be statistically significant.

The above finding clearly infers that there was no significant improvement in the level of knowledge regarding occupational respiratory status among Marble Factors Workers in the control group.

Table 5: Comparison of pre-test and post -test level of knowledge regarding occupational respiratory status among Marble Factory Workers between the experimental and control group.

n = 60(30+30)

Test	Group	Mean	S.D	Student Independent 't' Test Value
Pre-test	Experimental	16.20	3.16	t = 0.243
	Control	16.00	3.23	p = 0.809
				N.S
Post Test	Experimental	25.77	2.54	t = 13.014
	Control	16.20	3.12	p = 0.0001
				S***

***p<0.001, S – Significant, N.S – Not Significant

The table 5 depicts that the pre-test mean score of knowledge among Marble Factory Workers in the experimental group was 16.20±3.16 and the mean score in the control group was 16.0±3.23. The calculated student independent's' test value of t=0.243 was not found to be statistically significant.

The table 5 also portrays that the post-test mean score of knowledge among Marble Factory Workers in the experimental group was 25.77±2.54 and the post -test mean score in the control group was 16.20±3.12. The calculated student independent's' test value of t=13.014 was found to be statistically significant at p<0.001 level.

The above finding shows that there was significant difference in the level of knowledge between the experimental and control group which clearly infers that planned teaching programme administered to the Marble Factory Workers in the experimental group was found to be effective in improving the level of pain considerably than the control group in the post test.

The study supported by GJ Churchyard., et al. (2015) had conducted study on respiratory diseases prevalence A exposure response relation in south African marble industry. In a cross sectional study 520 black gold miners were interviewed and had chest radiograph takes, mean length of service was 21,8 years (6.3-34.5)the mean intensity of respiration dust exposure was 0.37 mg /m3 range 0-0,707 and of quartz (0.053mg/m3) (range -0-0.52)the prevalence of respiratory diseases was 18.5-19.9 dependency on reader significant trends were found between the prevalence of respiratory diseases length of services mean intensity of

exposure and cumulative exposure, an urgent need for improved dust control in the industry is indicated. It the assumption of stability of accords with a mounting body of evidence than an OEC of 0.1 mg/m3 is not protecting against respiratory diseases.

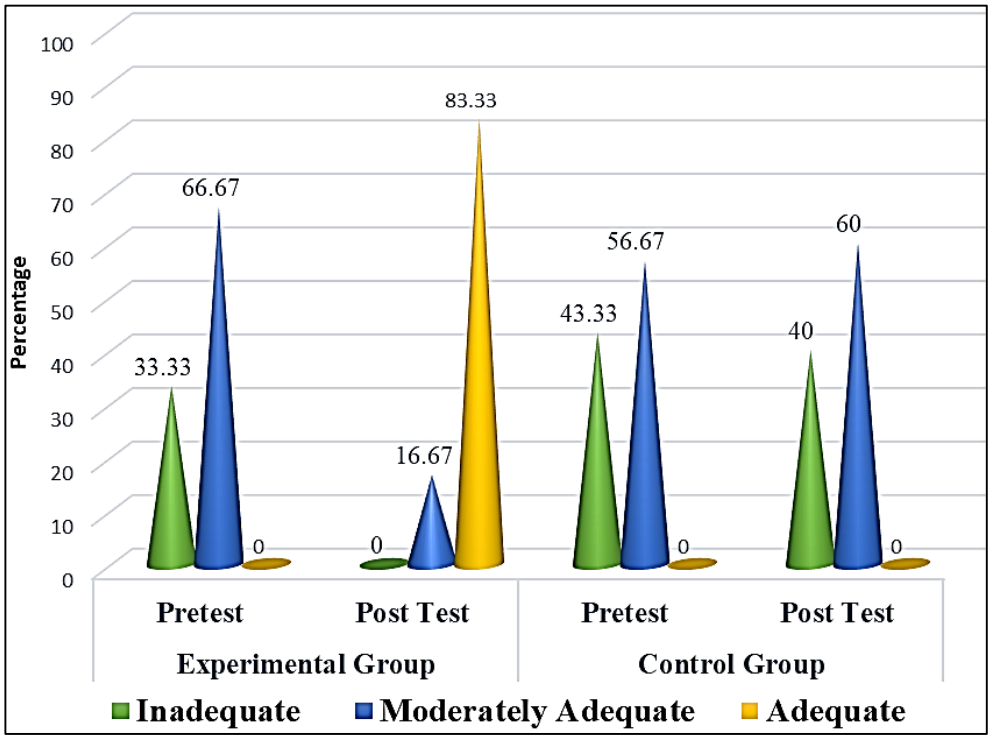

Fig 1: Comparison of knowledge among marble factory workers within and between the experimental and control group

The present study result shows that the pre-test mean score of knowledge among Marble Factory Workers was 16.20±3.16 and the post- test mean score was 25.77±2.54. The calculated Paired't' test value of t = 15.272 was found to be statistically highly significant at $p<0.001$ level.

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The above finding clearly infers that there was no significant improvement in the level of knowledge regarding occupational respiratory status among Marble Factors Workers in the control group.

Conclusion

This study includes that there is improvement in the level of knowledge of marble factory workers which indicated that the health education was effective. The demographic variable of marble factory workers significantly associated with the pre-test knowledge score. The development of planned teaching programme will help the marble factory workers to enhance their knowledge.

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