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Research Article

A Study on the Effect of Health Teaching Regarding Chronic Obstructive Pulmonary Disease among the Labourers Working in Selected Construction Sites in Pimpri-Chinchwad Municipal Corporation Area of Pune City

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Abstract

Introduction: Construction work is often described as a dirty, difficult, and dangerous job. It is one of the most hazardous and accident-prone activities, as reported by the International Labour Organization.

Objective: The objective of this study was to the effect of health teaching regarding chronic obstructive pulmonary disease (COPD) among the labourers working in selected construction sites in Pimpri-Chinchwad Municipal Corporation area of Pune City.

Materials and Methods: The research design used was one-group pretest-posttest experimental design; nonprobability convenience sampling method was used. The sample was selected from construction sites. The samples consisted of 60 males from construction sites of Sant Tukaram Nagar, Pimpri, Pune that were selected as per criteria. Data collection was done from December 21, 2010, to December 30, 2010.

Results: The majority of the samples (61.7%) were illiterate, 17 (28.3%) of them had primary education and the remaining 6 (10%) of them had secondary education. All 60 (100%) of them were laborers. All 60 (60%) of them were from economic status 5000–10,000. About 43.3% of people in pre-test of the study group were having poor knowledge score (0–7), majority 56.7% of people in pre-test of the study group were having average knowledge score (8–14), and not a single person in the pre-test study group were having good knowledge score (15–20), whereas in post-test, majority 81.7% of the people had good knowledge score (15–20) and 18.3% of people in post-test of the study group were having average knowledge score.

Conclusion: The health teaching on knowledge of COPD was found to be effective in increasing the knowledge in people. The samples had a highly significant gain in knowledge after the health teaching program.

Keywords: Chronic obstructive pulmonary disease, construction sites, health care, labourers

Introduction

Construction work is often described a dirty, difficult, and dangerous job. It is one of the most hazardous and accident-prone activities, as reported by the International Labour Organization (ILO). Construction sector involves work that is highly unsafe such as working at an excess height, welding, cutting, centering, and caring staff to high places without be the use of any kind of technology. Globally, 17% of all work-related fatalities are in the construction sector (ILO). Death and injury from accidents in the Indian construction sector are widespread. India has the world's highest accident rate among construction workers. Survey by the ILO found that 165 of every 1000 workers are injured in the construction sector.

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The main occupational health problems in the construction industry are face injuries while carrying heavy loads, respiratory disease from inhaling dust, such as chronic obstructive pulmonary disease (COPD), muscular-skeletal disorders, noise-induced hearing loss, and skin problems.[1]

The World Health Organization (WHO) estimates that COPD as a single cause of death shares the 4th and the 5th places with HIV/AIDS (after coronary heart disease, cerebrovascular disease, and acute respiratory infection). The WHO estimates that in 2000, 2.74 million people died of COPD worldwide. In 1990, a study by the World Bank and WHO ranked COPD at 12th as a burden of disease; by 2020, it is estimated that COPD will be ranked 5th. According to the WHO, passive smoking carries serious risks, especially for children and those chronically exposed. The WHO estimates that passive smoking is associated with a 10–43% increase in risk of COPD in adults. Although cigarette smoking is the primary cause of COPD, the WHO estimates that there are 400,000 deaths/year from exposure to biomass fuels.

COPD is also known as chronic obstructive lung disease, COPD refers to several disorders that affect the movement of air in and of lungs. Obstructive bronchitis and emphysema are considered to be the most important among all.[2] COPD is one of the leading causes of morbidity and mortality in both industrialized and developing countries. Cigarette smoking is the major risk factor for COPD but it indicates that about 15% of cases of COPD is work related. Specific setting and agents are quoted which have been indicated or confirmed as linked to COPD, concrete manufacturing workers have been seen to be at highest risk for developing COPD. In conclusion, occupational exposure to dust, chemical, and gases should be considered as risk factor for developing COPD.[3-11]

The objective of this study was to the effect of health teaching regarding COPD among the labourers working in selected construction sites in Pimpri-Chinchwad Municipal Corporation (PCMC) area of Pune City.

Materials and methods

In the present study, the investigator selected single group pretest-posttest pre-experimental design. Keeping in view the objectives of the study, the investigator observed that the group before the intervention of teaching (pre-test) the same group was given planned teaching using flash card and charts and after 7 days the group was observed again (post-test).

Variables and research hypothesis

Variables are the characteristics, quality, or attribute of a person or object that the experimenter manipulates, controls, or observes. Variables can be changed and this change is studied.

Independent variable

In this study, the independent variable is health teaching regarding COPD.

Dependent variable

In this study, the dependent variable is the knowledge score of laborers.

Setting of the study

"Setting" refers to the area where the study is conducted. The study was conducted at selected construction sites of Pimpri-Chinchwad area of Pune city. The laborers were cooperative and supportive. Hence, the rationale for selection of this construction sites was their geographical proximity, economy in terms of time, easy transport facilities, administrative approval, cooperation, and the selected laborers fulfilled the criteria of the sampling technique, above all homogeneity in this group can be maintained for the pre-test and post-test.

Population

"Population" is a group whose members possess specific attributes that researcher is interested in studying. The population of this study comprises laborers from selected construction sites of Pimpri-Chinchwad area of Pune city.

Sample and sampling technique

The sample is a portion of the sample that has been selected to represent the population of interest. A nonprobability convenient purposive sampling technique uses convenient sampling method. The researcher selects those units of the population in the sample which appear convenient to him or to the management of the organization where he is conducting the research.

A nonprobability convenient purposive sampling technique was used for selecting 60 laborers who met the set criteria during the period of data collection. Sixty laborers were selected from construction sites of Sant Tukaram Nagar, Pimpri-Chinchwad area in Pune city.

Sample size

"An optimum sample in survey is one which fulfills the requirements of efficiency, representativeness, reliability, and flexibility" the sample size plays an important role in sampling. Hence, the sample must be small enough to avoid sample error.[12]

The sample size selected for this study was 60. Only those who fulfilled the sampling criteria and who expressed willingness to participate in the study were selected.

Criteria for sample selection

Inclusion criteria

1. This study will include laborers who are willing to participate in the study.
2. This study will include all the laborers (male and female) above 18 years of age.
3. This study will include all the laborers (male and female) who can understand Marathi and Hindi language and even illiterate laborers will be included in the study.

Exclusion criteria

1. This study will exclude laborers who are not willing to participate in the study.

Pilot study

A pilot study is small-scale version study done preliminarily, to help in refining the problem, develop or refine hypothesis, or test and refine the data collecting methods. A pilot study is one that tests procedures or tools. The tool is tested in a pilot study, which is an important step in the development of a new tool or necessary changes in the same tool and increases its reliability and validity. After permission was sought, a pilot study was undertaken. A pilot study was conducted by the investigator on the laborers at construction sites of Sant Tukaram Nagar from October 11, 2010, to October 18, 2010 test the practicability of this tool and to decide on a plan for a statistical analysis. The study was conducted on 10 laborers. Data were collected through the structured questionnaire. Pre-test was given on the 1st day, i.e., on October 11, 2010; health teaching was administered on the same day and post-test was done on the 7th day, i.e., on October 18, 2010; using the same tool. After post-test, the data were analyzed with the help of descriptive and inferential statistics. Findings indicated that health teaching was effective for laborers of construction sites in increasing their knowledge regarding COPD.

Procedure for data collection

Data collection commenced after the prior permission taken from the contractor of the construction site. The data collection was done from October 21, 2010, to October 23, 2010 and ended on October 28, 2010, to October 30, 2010. A starting of this session to the group of laborers was introduced by investigator. They were explained about the purpose of the study and assured about confidentiality of the information between the investigator and the respondent only. The investigator himself administered the structured questionnaire for the pre-test. Everyday 20 samples were taken for pre-test, respectively, from October 21, 2010, to October 23, 2010 and ended on October 28, 2010, to October 30, 2010. The duration of data collection for pre-test was 30 min. Health teaching was given to these study groups by keeping the language simple and in Marathi and Hindi language as all the participants were Marathi and Hindi speaking laborers. Hence, the session was a pleasant experience. The instructions about post-test were given to the respective participants; after 7th day of the pre-test, the post-test was conducted from October 28, 2010, to October 30, 2010, respectively, by the investigator. Time taken for post-test was approximately 30 min.

Data analysis

The investigator decided to analyze the data using descriptive and inferential statistics and present them in tables, graphs, and figures. The following plan of analysis was made with the opinion of experts. The analysis will be done based on the objectives and hypotheses to be tested.

- Items related to background variables would be analyzed in terms of frequency and percentages.
- Bar graphs would be plotted to compare the distribution of pre-test and post-test knowledge score.
- Mean median, standard deviation, and mean percentage of pre- and post-test knowledge scores would be computed.
- Paired "*t*"-test would be applied to determine the significance of difference between mean pre-test knowledge scores and mean post-test knowledge scores.
- Association between demographic variables and pre-test knowledge score would be assessed using analysis of variance (ANOVA).

Results

Table 1 shows that the majority of 25 (41.7%) of samples were from the age group 30–39 years. All 60 (100%) of them were males. Majority of 37 (61.7%) of them were illiterates. All 60 (100%) of them were laborers. All 60 (60%) of them were from economic status 5000–10,000.

Paired *t*-test was applied to compare area wise difference between average scoring of before and after planned teaching to respondents.

For blueprint area, "Respiratory system and awareness" t-statistic was found to be 16.38 with corresponding $P = 0.000$.

For blueprint area, "Meaning and causes" t-statistic was found to be 3.28 with corresponding $P = 0.001$.

For blueprint area, "Sign and symptoms" t-statistic was found to be 8.94 with corresponding $P = 0.000$.

For blueprint area, "Home management and Prevention" t-statistic was found to be 12.62 with corresponding $P = 0.000$. Since this $P < 0.05$, there is significant difference in average score for blueprint area "Home management and Prevention."

For blueprint area, "Dietary management and complication" t-statistic was found to be 12.76 with corresponding $P = 0.000$ as Table 2.

The researcher concluded at 5% level of significance and 59 degrees of freedom that the above data give sufficient evidence to conclude that people who had received health teaching on COPD had higher mean knowledge scores in

Table 1: Description of samples according to demographic characteristics by frequency and percentage (n=60)

Demographic variable	Category	Frequency	%
Age	18–29	11	18.3
	30–39	25	41.7
	40–49	10	16.7
	50 and above	14	23.3
Gender	M	60	100.0
	F	0	0.0
Education	Illiterate	37	61.7
	Primary	17	28.3
	Secondary	6	10.0
	Graduate and above	0	0.0
Occupational	Laborer	60	100.0
Economic status	Below Rs. 5000/-	0	0.0
	Rs. 5000–10,000/-	60	100.0
	Rs. 10,000–15000/-	0	0.0
	Rs. above 15,000/-	0	0.0

Table 2: Distribution of area wise pre-test and post-test knowledge scores ($n=60$)

Area	Test	Mean	SD	T	df	*P*
Respiratory system and awareness	Pre-test	2.40	1.06	16.38	59	0.000
	Post-test	4.77	0.46			
Meaning and causes	Pre-test	1.18	0.91	3.28	59	0.001
	Post-test	1.67	0.63			
Sign and symptoms	Pre-test	1.28	0.85	8.94	59	0.000
	Post-test	2.45	0.70			
Home management and Prevention	Pre-test	1.23	1.02	12.62	59	0.000
	Post-test	3.40	0.74			
Dietary management and complication	Pre-test	1.42	0.96	12.76	59	0.000
	Post-test	3.45	0.75			

Table 3: Pre-test and post-test knowledge scores (n=60)

Test	Mean	Standard deviation	T	Df	*P* value
Pre-test	7.52	2.98	19.54	59	0.000
Post-test	15.73	1.67			

post-test than in pre-test for each of the blueprint area. Hence, we reject null hypothesis and accept research hypothesis. It can be concluded that the health teaching on knowledge of COPD is proved to be effective in delivering the knowledge and awareness.

Overall analysis of data related to the effect of health teaching on the knowledge score based on correct answers in the study group.

There were 60 people in a sample. Each of them had answered 20 questions. Their pre- and post-test correct answers were recorded, and mean and standard deviation of the test scores are obtained as Table 3.

Paired *t*-test was applied to compare scores before and after health teaching to respondents. *t*-value was found to be 19.54 and corresponding $P = 0.000$. According to paired *t*-test; null hypothesis was rejected and research hypothesis was accepted. Researcher concluded at 5% level of significance and 59 degrees of freedom that knowledge scores of people improved significantly after receiving health teaching on COPD. Thus, the health teaching on COPD is proved to be effective in delivering the knowledge and awareness.

Table 4 shows that the 43.3% of people in pre-test of the study group were having poor knowledge score (0–7), majority 56.7% of people in pre-test of the study group were having average knowledge score (8–14), and none of them in the pre-test study group were having good knowledge score (15–20), whereas in post-test majority 81.7% of the people had good knowledge score (15–20) and 18.3% of people in post-test of the study group were having average knowledge score shown in Figures 1 and 2.

The knowledge scores of the samples show a marked increase as seen in the post-test score of the study group, which indicate that the planned teaching is effective in increasing the knowledge of the samples regarding COPD in people.

An analyzed data to find relationship between knowledge and selected demographic variables. The investigator has tried to

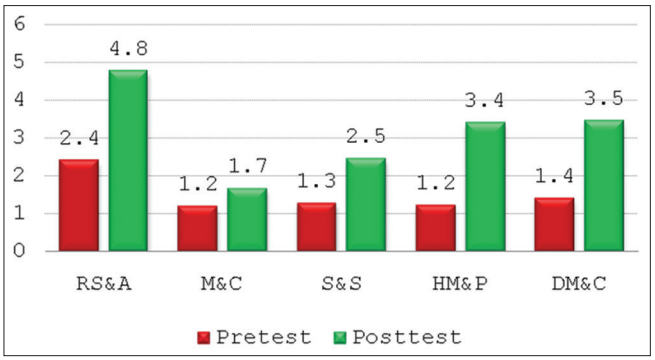

Figure 1: Bar diagram showing area wise pre-test and post-test knowledge scores. RS&A: Respiratory system and awareness, M&C: Meaning and causes, S&S: Sign and symptoms, HM&P: Home management and Prevention, DM&C: Dietary management and complication

Figure 2: Bar diagram showing pre-test and post-test knowledge scores

classify the answers given by people according to the different variables such as age, gender, education, occupation, and monthly income.

To check the average between various categories (more than 2), the researcher applied one way ANOVA to find relationship between knowledge and education. There is no evidence against null hypothesis and no significant difference between the average score in different education categories. There is no significant difference between the average score in different education categories.

To check the average between various groups (more than 2), the researcher applied one way ANOVA to find relationship between knowledge and age. There is a significant difference between the average score in different age groups. Results are significant at 5% level of significance and (3, 56) degrees of freedom.

Table 4: Distribution of overall knowledge score in frequency and percentage obtained by the study group

Knowledge score	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
0–7 (Poor)	26	43.3	-	-
8–14 (Average)	34	56.7	11	18.3
15–20 (Good)	-	-	49	81.7
Total	60	100.0	60	100.0

Table 5: Analysis of data to find relationship between knowledge and education

Source of variation	SS	df	MS	F	*P*
Education	0.34	2	0.17	0.02	0.98
Error	522.64	57	9.17		
Total	522.98	59			

Table 6: Analysis of variance of age versus knowledge

Source of variation	SS	Df	MS	F	*P*
Between groups	348	3	116	37.12	0.000
Within groups	175	56	3.125		
Total	523	59			

Table 7: Analysis of data to find relationship between knowledge and age

Age (years)	*n*	Mean	Standard deviation
18–29	11	4.00	2.10
30–39	25	6.72	1.84
40–49	10	8.20	1.81
50 and above	14	11.21	1.25

From the above Tables 5-7, it is quite clear that average knowledge score in pre-test. The researcher can infer that more the age more is the awareness regarding COPD. The association of demographic variables gender, occupation, and monthly income could not be assessed because all are males laborers and having same income.

Discussion

Analysis of the first phase revealed that the majority of 41.7% of the samples were between the age group 30–39 years. All of the samples were males as males are more in numbers than the female at the construction site as they can perform heavy work. Majority of samples were illiterates. All of the samples were having economic status Rs. 5000–10,000/-. The 43.3% of people in pre-test of the study group had poor knowledge score (0–7), majority 56.7% of people in pre-test of the study group were had average knowledge score (8–14), and not a single person in the pre-test study group were having good knowledge score (15–20). Whereas in post-test a majority 81.7% of the people had good knowledge score (15–20), and 18.3% of people in the post-test study group had an average knowledge score.

The majority of the samples scored high in post-test than that of pre-test and the mean percentage score of samples regarding knowledge of COPD was higher in post-test than that of pre-test. This can be due to the effect of health teaching. The post-test scores obtained were significantly higher than the pre-test scores at 5% level of significance. This suggests that the planned teaching on knowledge of COPD was effective. Although the planned teaching is effective in improving knowledge level, there is a need for continuous reinforcement, motivation, lifestyle modification, and follow-up.

The findings on relationship between knowledge regarding COPD and selected variables show that there is a significant association of age with knowledge score, but the association of education is not statistically significant. This study highlighted that the aged people had a good knowledge about COPD.

COPD is disabling with symptoms such as chronic cough, phlegm, wheezing, shortness of breath, and increase infection of respiratory passage. The aim was to examine the effect of a structured educational intervention program at nurse-led primary health care clinic on quality of life (QOL), knowledge about COPD, and smoking cessation in patient with COPD. The study had an experimental design in which 52 patients with COPD from a Swedish Primary Care setting were randomized into two groups (intervention or control). Both groups received standard care but patient in the intervention group was also offered two visits to a nurse specialized in COPD care. The purpose of visit was to increase the patients self-care ability and their knowledge about COPD. Data were collected using two questionnaires, one pertaining to knowledge about COPD and smoking habit and St. George's questionnaire addressing how QOL was affected by patients respiratory system. The intervention and control groups answered both questionnaires on their first and last visit to the PHCC. A statistically significant increase was noted in the intervention group on QOL, the number of patients who stop smoking and patients knowledge about COPD at follow-up 3–5 months after intervention. This implies that patient was in dependent relationship which may have affected the responses in a favorable direction. Finding shows that conventional care alone did not have an effect on patients QOL and smoking habit, instead, the evidence suggests that structure program with self-care education is needed to motivate patients for lifestyle change.[13]

Limitation

- This study is limited to PCMC area of Pune city.
- Sample size is not more than 60.
- This study is limited only to those adults who are willing to participate in this study.
- Male and female adults above 18 years old.

Conclusion

The health teaching on knowledge of COPD was found to be effective in increasing the knowledge in people. The samples had a highly significant gain in knowledge after the health teaching program.

The health teaching on knowledge of COPD was found to be effective in enhancing to take the preventive measures for COPD among construction workers.

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