A Pilot Study to Evaluate the Effectiveness of Chronic Obstructive Pulmonary Disease Prevention Program on Knowledge, Attitude, Practice and Pulmonary Function among Adult Males

1 A Lakshmi 2 Revathi Vijayalakshmi
1- Principal, Sarvodaya college of Nursing, Bangalore, Karnataka, India.
2- PhD Research Guide, Omayal Achi College of Nursing, Chennai, Tamilnadu, India.

Abstract

A Pilot study was conducted to evaluate the effectiveness of a Chronic Obstructive Pulmonary Disease Prevention Program on knowledge, attitude, practice, and pulmonary function among adult males in a selected rural community in Thiruvallur district, Chennai. 30 adult male smokers in the experimental and control groups who fulfilled the inclusion criteria were selected, using simple random sampling. A Structured questionnaire, rating scale, Fagerstrom questionnaire and spirometry test (GOLD Criteria) were used to assess the pre-test knowledge, attitude, practice and pulmonary function respectively. A COPD prevention program in the form of health education, breathing exercises, individual counselling for smoking cessation and behavioural strategies was implemented for the experimental group. The post-test was assessed after 12 weeks for both groups. The results revealed that there was a significant difference in the pre-test and post-test level of knowledge, attitude, practice and pulmonary function. The study concluded that a chronic obstructive pulmonary disease prevention program was effective in improving the knowledge, attitude, practice and pulmonary function among adult male smokers.

Keywords: knowledge, attitude, practice, pulmonary function, chronic obstructive pulmonary disease prevention program

Introduction

Respiratory diseases are the most prevalent and most rapidly expanding diseases worldwide. Millions of people suffer from respiratory disease and take each breath as a major accomplishment.

Chronic obstructive pulmonary disease is the most common chronic respiratory disease among adults [1]. COPD dominates all other chronic respiratory diseases in accounting for almost 4 percent of disability adjusted life years (DALYS) lost among adults worldwide [2]. Smokers have 3 times more risk to develop COPD as compared to non-smokers and bidi smokers were at higher risk of developing COPD. The adult males smokers were unaware about the effect of smoking on their lung health [3,4].
Considering the above stated factors, the investigator perceived the need for assessing the Knowledge, Attitude, Practice and Pulmonary Function, and determining the effectiveness of a Chronic Obstructive Pulmonary Disease Prevention Program. This evidence will be utilized to frame a secondary level of health care practices for effective COPD management.

Statement of the problem
A pilot study to evaluate the effectiveness of a Chronic Obstructive Pulmonary Disease Prevention Program on Knowledge, Attitude, Practice and Pulmonary Function among adult males in a selected rural community in Thiruvallur District, Chennai.

Objectives
1. To assess and compare the pre-test and post-test level of knowledge, attitude, practice and pulmonary function in the study group and control group.
2. To evaluate the effectiveness of a Chronic Obstructive Pulmonary Disease Prevention Program on the Knowledge, Attitude, Practice and pulmonary function in the study group and control group.

Null Hypotheses:
Ho1: There is no difference in the knowledge, attitude, practice and pulmonary function among adult males in the study group and control group at p<0.05 level of significance.

Methods
In view of the nature of the problem and to accomplish the objective of the study, a Quantitative research approach with a True experimental pre-test - post-test design was adopted.

Variables of study: The independent variable of the study was the Chronic Obstructive Pulmonary Disease Prevention Program. The dependent variables of the study were Knowledge, Attitude, Practice and Pulmonary function. The extraneous variables of the study were age, education, occupation, income, type of smoking, number of cigarettes smoked per day, number of years of smoking, person who influenced to smoke, use of smokeless tobacco.

Setting: The study was conducted in 2 adopted villages of Omayal Achi Community Health Centre (OACHC), Arakambakkam, one village each for experimental and control group.

Population: The target Population of the study comprised of adult males. The accessible population comprised of adult males residing in 18 villages adopted by OACHC. Thus, from the accessible population, the 2 villages were selected through random sampling lottery method.

Sampling Technique: A Multi-stage Probability sampling technique was used to select the samples. There were about 75 adult male smokers living in the 2 selected villages who were selected through a household survey. 35 adult males who fulfilled the inclusion criteria were included, both in the experimental and control groups.

Sample selection criteria

Inclusion Criteria
1. Adult males identified as smokers.
2. Adult males willing to participate in the study.
3. Adult males who were permanent residents of the village.
4. Adult males who were in the age group of 20 – 55 years.
5. Adult males who gave consent to adhere to the behavioral intervention.

Exclusion Criteria
1. Adult males with other chronic respiratory diseases but not critically ill.
2. Adult males who were not co-operative were excluded from the study.

Technical Information

The data collection tool was designed to collect information pertaining to demographic data and to assess the key variables of the study, namely, knowledge, attitude, practice and pulmonary function.

Part I: Demographic data sheet: A questionnaire to collect the baseline data of adult males.

Part II: It consisted of the following components.

(i) **Structured Questionnaire**: It was used to assess the knowledge level of the prevention of Chronic Obstructive Pulmonary Disease

(ii) **Rating scale**: A five point rating scale was used to assess the attitude towards prevention of chronic obstructive pulmonary disease and was done by a five point attitude scale.

(iii) **The Fagerstorm Questionnaire**: The practice of nicotine dependence was assessed using the Fagerstorm questionnaire.

(iv) **Spirometry test**: The pulmonary function was assessed using the spirometry test. The investigator was trained to assess the pulmonary function using the spirometer. The spirometer used was RMS-Helios. The spirometer is calibrated for its function.

Reliability
The reliability of the structured questionnaire and rating scale was tested using test retest method and the r value was 0.87 & 0.88 respectively. The reliability of the practice questionnaire (Fagerstorm) and the Spirometer (pulmonary function) was established using interrater method and the r value was 0.90 for both. The spirometer was also calibrated for its reliability.

Data collection procedure: The Investigator obtained formal consent from the administrator of OACHC, the village leader and adults. The purpose of this study and confidentiality was explained to the adult males. The Investigator selected 70 adult males from two villages as per the inclusion criteria for the study. They were divided through randomization into 35 each in the control group and experimental group. After attrition, the sample size was 30 in each group.

The data collection instruments were structured knowledge questionnaire, rating scale, checklist and spirometry to assess the knowledge, attitude, practice and pulmonary function respectively. The Chronic Obstructive Pulmonary Disease Prevention Program with a combination of nursing interventions namely Health Education, behavioural strategies, breathing exercises and Individual counselling on smoking cessation were implemented by
the investigator for a period of 12 weeks. The post-test was done for both groups after 12 weeks. The data was entered into an Excel worksheet and analyzed through the Statistical Package for Social Science / PC+ Ver.17.

**Ethical Approval:** The investigator adhered to the following actions in order to protect the ethical rights of the adult males.

1. Ethical committee approval was received from the International Centre for Collaborative Research in Primary Health Care (ICCRPHC), Omayal Achi College of Nursing.
2. To execute the study, a written consent from the Head of the Institution was obtained to conduct the study at OACHC.
3. The investigator is certified to execute the counselling and behavioral strategies.
4. Potential benefits and risks were explained to the adult males.
5. Informed consent was obtained from the adult males related to the study purpose, type of data, nature of commitments, participations and procedure.
6. Confidentiality and anonymity pledge was ensured.
7. The control group adult males were also given the same intervention as Wait List interventions.

Statistical methods:

Descriptive Statistics
1. Demographic Variables was analyzed by using frequency and percentage distribution.
2. The knowledge, attitude, practice and pulmonary function variables were analyzed by mean, median and standard deviation.

Inferential Statistics
1. The effectiveness of the chronic obstructive pulmonary disease prevention program on knowledge, attitude, practice and pulmonary function was assessed by Paired ‘t’ test
2. Unpaired ‘t’ test was used to find the effectiveness of chronic obstructive pulmonary disease prevention program on knowledge, attitude, practice and pulmonary function among adults in the experimental and control group.

Results

Description of Background Variables of Adult males in Pre-test for experimental and control group.

In both experimental and control groups, a majority of 33.6% belonged to the age group of 31 – 40 years and 80% of them were married. A majority of 29.1% of adult males were educated up to middle school in the experimental and control groups. The majority of adult males in both the groups were unskilled/landless labour with an income of Rs.3301 to Rs.7300. Most of them, 52.7% in the experimental group and 53.6% in the control group were beedi smokers, smoking 0 – 5 smokes per day. A majority of them was influenced by mass media and were smokers for a period of 6 –10 years.

Assessment and Comparison of knowledge, attitude, practice, and pulmonary function of adult males in the experimental and control group.

The level of significance was set at $P \leq 0.05$ level. In the pre-test of the experimental group, 20 (66.7%) had inadequate knowledge and 10 (50.9%) had moderate knowledge. Similarly, in the control group, 19 (63.3%) had inadequate knowledge and 11 (36.7%) had moderate knowledge. In the post-test of the experimental group, 9 (30%) had inadequate knowledge and 21 (70%) had moderate knowledge. Also, 18 (60%) had inadequate knowledge 11 (36.7%) had moderate knowledge, in the control group. The analysis revealed that the pre-test knowledge mean was 36.7% and post-test mean was 46.5% in the experimental group and in the control group, pre-test and post-test mean scores were 36.9% and 37.2% respectively.

In the experimental group, 11 (36.7%) had an unfavourable attitude and 19 (63.3%) had a favourable attitude in the pre-test. Similarly, in the control group 10 (33.3%) had an unfavourable attitude and 20 (66.7%) had a favourable attitude. In the post-test, the experimental group, 3 (10%) had an unfavourable attitude, 27 (90%) had a favourable attitude. And 9 (30%) had an unfavourable attitude, 21(70%) had a favourable attitude in the control group.
In the experimental group, the pre-test attitude mean was 57.3% and post-test mean was 67.8% and in the control group, pre-test mean was 56.5% and post-test attitude mean was 56.6%. In the pre-test of the experimental group, 16(53.3%) had very low dependence (practice) and 14 (46.7%) had medium dependence (practice). Similarly, in the control group, 17 (56.7%) had very low dependence (practice) and 13 (43.3%) had medium dependence (practice). In the post-test, 25(83.3%) had very low dependence (practice), 5 (16.7%) had medium dependence (practice) in the experimental group. And 18 (60%) had very low dependence (practice) and 12 (40%) had medium dependence (practice) in the control group.

The pre-test Practice mean was 28.8 % and post-test practice mean score was 18.8 % in the experimental group, and in the control group, pre-test and post-test practice mean scores were 28.4 % and 27.5% respectively.

In the pre-test, 11 (36.7%) had normal pulmonary function and 16 (53.3%) had mild COPD and 3 (10%) had moderate COPD in both experimental and control groups. In the post-test, 11 (36.7%) had normal pulmonary function and 18 (60 %) had mild COPD and 1 (3.3%) had moderate COPD in the experimental group and no improvement was found in the post-test of the control group.

Effectiveness of the Chronic Obstructive Pulmonary Disease Prevention Program on the knowledge, attitude, practice, and pulmonary function among adult males in the experimental group and control group.

Table 1: Frequency and percentage distribution of Pre-test and post-test level of Knowledge among Adult males.

<table>
<thead>
<tr>
<th>Test</th>
<th>Knowledge</th>
<th>Group</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experiment</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Pre-test</td>
<td>Inadequate</td>
<td>20</td>
<td>66.7%</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>10</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Adequate</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Post-test</td>
<td>Inadequate</td>
<td>9</td>
<td>30.0%</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>21</td>
<td>70.0%</td>
</tr>
<tr>
<td></td>
<td>Adequate</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 2: Frequency and percentage distribution of pre-test and post-test level of attitude among Adult males.

<table>
<thead>
<tr>
<th>Test</th>
<th>Attitude</th>
<th>Group</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experiment</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Pre-test</td>
<td>Unfavourable</td>
<td>11</td>
<td>36.7%</td>
</tr>
<tr>
<td></td>
<td>Favourable</td>
<td>19</td>
<td>63.3%</td>
</tr>
<tr>
<td>Post-test</td>
<td>Unfavourable</td>
<td>3</td>
<td>10.0%</td>
</tr>
<tr>
<td></td>
<td>Favourable</td>
<td>27</td>
<td>90.0%</td>
</tr>
</tbody>
</table>
The analysis revealed that the overall Knowledge mean gain score was 9.8% in the experimental group and 0.3% in the control group. Attitude mean gain score was 10.6% in the experimental group and 0.1% in the control group. Practice (nicotine dependence) mean score reduced by 10.0% in the experimental group and reduced only 0.9% in the control group. Also, there was mild improvement in the pulmonary function (FEV1) in the post-test of the experimental group. Hence, the null hypothesis stated was accepted for the control group and rejected for the experimental group.

Table.3: Frequency and percentage distribution of pre-test and post-test level of practice (nicotine dependence) among Adult males.

<table>
<thead>
<tr>
<th>Test</th>
<th>Practice</th>
<th>Group</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experiment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>Very low</td>
<td>6</td>
<td>53.3%</td>
<td>7</td>
<td>56.7%</td>
<td></td>
<td>χ²=0.06  P=0.79 DF=1</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>4</td>
<td>46.7%</td>
<td>3</td>
<td>43.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td>Very low</td>
<td>25</td>
<td>83.3%</td>
<td>8</td>
<td>60.0%</td>
<td></td>
<td>χ²=4.05 P=0.04* DF=1 significant</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>5</td>
<td>16.7%</td>
<td>12</td>
<td>40.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion
The findings of the study revealed that there was an overall improvement in the knowledge, attitude, practice (nicotine dependence) and pulmonary function among adult males in the experimental group, whereas there was no improvement in the control group. Thus, health education, behavioral strategies, breathing exercises and individual counselling on smoking cessation, as interventions in the Chronic Obstructive pulmonary Disease Prevention Program had a significant impact on the Knowledge, Attitude, Practice and Pulmonary Function among adult males in the experimental group. The study concluded that the Chronic Obstructive Pulmonary Disease Prevention Program was an effective strategy to improve Knowledge, Attitude, Practice and Pulmonary Function among adult males.

Conclusion
The findings of the pilot study gave the evidence that the tool was reliable, feasible and it was practicable to conduct the main study. The study concluded that the Chronic Obstructive Pulmonary Disease Prevention Program had a significant impact on the Knowledge, Attitude, Practice and Pulmonary Function among adult males. Hence, the study recommended the utilization of the Chronic Obstructive Pulmonary Disease Prevention Program by Nurse Educators, Nurse Administrators, Nurse Researchers and Healthcare professionals to prevent Chronic Obstructive Pulmonary Disease at all levels among adult males.

Source of Support: Nil
Conflict of Interest: None declared.

References: