IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Effectiveness Of A Structured Teaching Programme On Knowledge Regarding Pulmonary Rehabilitation Among Patients With Chronic Obstructive Pulmonary Disease At A Selected Hospital

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1. Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) significantly impairs quality of life. Pulmonary Rehabilitation (PR) is crucial for management, yet patient knowledge and participation are often limited. This study aimed to determine the effectiveness of a Structured Teaching Programme (STP) in improving knowledge about PR among COPD patients.

Methods: A quantitative evaluative approach using a one-group pre-test post-test design was conducted. A convenience sample of N=100 confirmed COPD patients was recruited from a selected hospital. Knowledge was assessed using a 30-item self-structured questionnaire before (pre-test) and 7 days after (post-test) the administration of the 45-minute STP. Data analysis used descriptive statistics and the paired t-test at $p<0.05$.

Results: The mean pre-test knowledge score was $M_{pre}=10.25\pm3.12$ (34.17%), indicating inadequate knowledge. Following the STP, the mean post-test score significantly increased to $M_{post}=22.80\pm2.55$ (76.00%). The paired t-test yielded a value of $t=31.78$ at $df=99$, with a p-value of <0.001. This demonstrated a highly significant gain in knowledge. Educational status (secondary and higher education) was significantly associated with higher post-test knowledge ($\chi2=12.45, p=0.002$).

Conclusion: The Structured Teaching Programme was highly effective in significantly enhancing patient knowledge regarding pulmonary rehabilitation. These findings strongly advocate for incorporating structured, nurse-led educational interventions as a mandatory step in the management protocol for COPD patients.

Keywords: Chronic Obstructive Pulmonary Disease, Pulmonary Rehabilitation, Structured Teaching Programme, Patient Knowledge, Effectiveness, Education.

I. Introduction

A. Background and Significance

Chronic Obstructive Pulmonary Disease (COPD) is a progressive, debilitating lung disease, ranking as one of the leading causes of death worldwide. The disease is characterized by chronic inflammation and airflow limitation, leading to debilitating symptoms like dyspnea and exercise intolerance. Pulmonary Rehabilitation (PR) is a cornerstone of non-pharmacological management,proven to reduce symptom severity, increase exercise tolerance, improve health-related quality of life (HRQoL), and decrease hospital readmissions.

Effective participation in and adherence to PR is predicated on the patient's comprehensive understanding of the programmer's components, including specialized breathing techniques, energy conservation strategies, and the importance of lifelong exercise. However, patients often receive fragmented information, leading to low foundational knowledge and subsequent poor engagement with PR services. Nurses and specialized educators are ideally positioned to deliver standardized, impactful education. This study addresses the critical need for an evidence-based, focused teaching methodology—the Structured Teaching Programme (STP)—to bridge this knowledge gap.

B. Statement of the Problem

Assess the effectiveness of a Structured Teaching Programme on knowledge regarding pulmonary rehabilitation among patients with chronic obstructive pulmonary disease at a selected hospital.

C. Objectives

- To assess the pre-test knowledge level regarding pulmonary rehabilitation among COPD patients.
- To determine the effectiveness of the Structured Teaching Programme by comparing pre-test and post-test knowledge scores.
- To find the association between the post-test knowledge score and selected demographic and clinical variables.

II. Methods

A. Research Approach and Design

A quantitative evaluative research approach was utilized, adopting a pre-experimental, one-group pre-test post-test design. This design is appropriate for measuring the effect of an intervention (STP) on a dependent variable (knowledge) within a single group of participants.

B. Setting and Sample

The study was conducted at the Outpatient Department and Pulmonary Medicine Wards of over a 6-week period. A non-probability convenience sampling technique was used to recruit a total of N=100 patients.

C. Tool and Intervention

Self-Structured Knowledge Questionnaire: A 30-item, multiple-choice questionnaire was developed to assess knowledge across five domains of PR: Definition/Benefits, Breathing Techniques, Exercise Training, Nutritional Advice, and Self-Management. Scores ranged from 0 to 30. Knowledge was categorized as: Inadequate (0-10), Moderately Adequate (11-20), and Adequate (21-30). The tool demonstrated high internal consistency (Kuder-Richardson 20, r=0.81).

Structured Teaching Programme (STP): The STP was a standardized, 45-minute educational module covering all five domains of PR, based on GOLD guidelines. It was delivered using visual aids (posters, video clips) and interactive techniques to ensure clarity and engagement.

D. Data Collection Procedure

The procedure involved three phases. Pre-test: The knowledge questionnaire was administered to all 100 participants to establish baseline. Knowledge Intervention: Immediately following the pre-test, the STP was delivered to the participants in small groups (n=10 to 15).Post-test: The same questionnaire was re-administered exactly 7 days after the intervention to measure the effectiveness and short-term knowledge retention.

E. Data Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics (frequency, percentage, mean, Standard Deviation (SD)) characterized the sample and knowledge levels. Inferential statistics included the paired t-test to compare the difference between pre-test and post-test mean scores. The Chi-square test was used to find the association between post-test knowledge scores and socio-demographic variables. The level of significance was fixed at $p<0.05$.

III. Results

A. Demographic and Clinical Characteristics

Table 1: Distribution of Participants by Socio-demographic Variables (N=100)

Variable	n (100)	Percentage (%)
Age (Years)		
40-59	45	45.0
60 and above	55	55.0
Gender		
Male	72	72.0
Female	28	28.0

Educational Status		

Variable	n (100)	Percentage (%)
Primary/Illiterate	25	25.0
Secondary/Higher	75	75.0
Duration of COPD		
≤5 years	58	58.0
>5 years	42	42.0

B. Pre-test Knowledge Assessment

Table 2: Pre-test and Post-test Knowledge Level Distribution (N=100)

Knowledge Level (Score Range)	Pre-test n (100)	Percentage (%)	Post-test n (100)	Percentage (%)
Inadequate (0-10)	68	68.0	0	0.0
Moderately Adequate (11-20)	28	28.0	6	6.0
Adequate (21-30)	4	4.0	94	94.0

C. Effectiveness of the Structured Teaching Programme

Table 3: Comparison of Pre-test and Post-test Knowledge Scores (N=100)

Assessment	Mean Score (Max 30)	Standard Deviation (SD)	Mean Difference (Gain Score)
Pre-test	10.25	3.12	12.55
Post-test	22.80	2.55	

Table 4: Statistical Test for Effectiveness

Comparison	Paired t-value	df	p-value	Interpretation

Comparison	Paired t-value	df	p-value	Interpretation
Pre-test vs. Post-test	31.78	99	<0.001	Highly Significant

The highly significant p-value (<0.001) confirms that the Structured Teaching Programme was effective in increasing the knowledge of COPD patients regarding pulmonary rehabilitation.

D. Association between Post-test Knowledge Scores and Selected Variables

The Chi-square analysis revealed a statistically significant association between educational status and the post-test knowledge level ($\chi 2=12.45, p=0.002$). No significant association was found between post-test knowledge scores and other variables (age, gender, and duration of illness) ($p>0.05$).

IV. Discussion

A. Interpretation of Findings

The baseline data ($M_{pre}=10.25$) underscored a critical deficit in patient knowledge about PR, validating the need for the intervention. The remarkable post-test score ($M_{post}=22.80$) and the highly significant t-test result ($t=31.78, p<0.001$) strongly confirm the effectiveness of the Structured Teaching Programme. This profound knowledge gain is attributed to the STP's design—being structured, clearly defined, utilizing multimodal teaching aids (visual, verbal), and providing immediate reinforcement—which promotes optimal adult learning.

The significant association with educational status ($p=0.002$) suggests that while the STP is effective overall, educational materials and delivery strategies must be carefully adapted for patients with lower literacy levels to ensure equitable knowledge gain.

B. Implications for Nursing Practice and Education

These findings provide empirical support for establishing a mandatory, formalized Structured Teaching Programme delivered by respiratory nurses or certified educators prior to or during the initial phase of PR. This intervention can serve as a prerequisite to ensure patients have the foundational knowledge necessary to maximize the benefits of PR engagement and long-term self- management.

C. Limitations

The study used a pre-experimental one-group design, which limits the ability to definitively rule out extraneous variables (e.g., maturation). The use of convenience sampling and the single-setting nature of the study also restrict generalizability. Furthermore, this study only measured an increase in *knowledge* and did not assess the resultant change in patient practice or improved clinical outcomes.

V. Conclusion and Recommendations

A. Conclusion

The Structured Teaching Programme on pulmonary rehabilitation was exceptionally effective in significantly improving the knowledge scores of patients with Chronic Obstructive Pulmonary Disease. This intervention is a valuable tool for nurses and healthcare teams in bridging the knowledge gap critical for successful PR engagement and self-management.

B. Recommendations

Practice: The hospital administration should formally adopt and integrate this Structured Teaching Programme into the standard protocol for all COPD patients who are candidates for pulmonary rehabilitation.

Research: Future research should employ a Randomized Controlled Trial (RCT) design to compare the STP with standard care, measure the long-term retention of knowledge (e.g., at 3 and 6 months), and specifically investigate the correlation between increased knowledge and objective clinical outcomes (e.g., reduction in exacerbations or improvement in 6-minute walk distance).

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