A Study to Assess the Effectiveness of Individual Health Teaching Programme on Knowledge regarding Pulmonary Rehabilitation among Patients with Chronic Obstructive Pulmonary Disease (COPD) in Selected Hospitals at Varanasi, UP

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Abstract: _Background:_ *Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease that causes breathing difficulties due to the obstruction of airflow. It is primarily caused by long-term exposure to harmful substances, most commonly cigarette smoke, but also environmental pollutants, dust, and chemicals. It is characterized by chronic inflammation of the airways, lung parenchyma (respiratory bronchioles and alveoli and pulmonary blood vessels.) COPD includes two main conditions: chronic bronchitis and emphysema, though many people with COPD experience both. According to the WHO-COPD is projected to become the third leading cause of death worldwide, which reflects as an increasing public health burden._ _Methodology:_ *A quantitative approach with a pre-experimental (one-group pretest post-test only) research design was used. Study included 50 patients diagnosed with COPD. A non-probability purposive sampling technique was used. Data collection was done using demographic variables, self-structured knowledge questionnaire followed by a health teaching programme on knowledge regarding pulmonary rehabilitation._ _Results:_ *The pretest results indicated that majority of the patients had poor level of knowledge (76%), 24% of patients had an average level of knowledge. The post-test results showed significant improvement, with 76% of patients demonstrating good level of knowledge with a mean difference of 9.02. A paired* t-test analysis yielded *a 't' value of (30.56*),* *indicating a statistically significant improvement in knowledge scores. This suggests that the intervention was effective in enhancing knowledge of COPD patients regarding pulmonary rehabilitation._ _Conclusion:_ *The study concludes that the health teaching programme effectively improved the knowledge of COPD patients.*

Keywords: Individual health teaching programme, knowledge, pulmonary rehabilitation, COPD

1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease that causes breathing difficulties due to the obstruction of airflow. It is primarily caused by long-term exposure to harmful substances, most commonly cigarette smoke, but also environmental pollutants, dust, and chemicals. It is characterized by chronic inflammation of the airways, lung parenchyma (respiratory bronchioles and alveoli and pulmonary blood vessels.)COPD includes two main conditions: chronic bronchitis and emphysema, though many people with COPD experience both. According to the WHO-COPD is projected to become the third leading cause of death worldwide, which reflects as an increasing public health burden [1].

Pulmonary rehabilitation is a multidisciplinary intervention designed to improve physical and psychological well-being among patients with chronic respiratory diseases. It includes components such as, breathing techniques, energy conservation, nutritional guidance, and education aimed at promoting self-management.[2] Several studies have shown that pulmonary rehabilitation significantly improves exercise tolerance, reduces dyspnea, and improve quality of life, and decreases hospital readmissions among COPD patients .[3]

Researchers from their own experience found out that there is lack of awareness regarding pulmonary rehabilitation among COPD patients. This awareness made the researchers to plan a health teaching programme to enhance the knowledge of the patients and improve their quality of life.

Objectives
The objectives for the study were:
- To assess the pretest knowledge score regarding pulmonary rehabilitation among patients with COPD.
- To assess the post test knowledge score regarding pulmonary rehabilitation among patients with COPD.
- To evaluate the effectiveness of individual health teaching programme on knowledge regarding pulmonary rehabilitation among patients with COPD.
- To find out the association between the pre-test

knowledge score regarding pulmonary rehabilitation among patients with COPD with their selected demographic variables.

Operational definitions

- **Effectiveness-**It refers to significant improvement in knowledge regarding pulmonary rehabilitation among patients with chronic obstructive pulmonary disease (COPD).
- **Individual health teaching programme-** It refers to the teaching material which includes Power point presentations and handout prepared on breathing exercises, relaxation techniques, adherence to medications, life style modifications and nutrition guidance related to COPD.
- **Knowledge on pulmonary rehabilitation-**It refers to the response of the patients with COPD measured by the self-structured questionnaire regarding pulmonary rehabilitation.
- **Patient with chronic obstructive pulmonary disease-** Refers to the patients who are diagnosed as chronic obstructive pulmonary disease, irrespective of age, sex, onset of disease, duration of hospital stay and type of treatment prescribed.
- **COPD-** Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease that causes breathing difficulties due to the obstruction of airflow. It is characterized by chronic inflammation of the airways, lung parenchyma. COPD includes two main conditions: chronic bronchitis and emphysema.

Hypotheses

The hypotheses will be tested at 0.05 level of significance.

- **H$_1$:** The mean post-test knowledge scores of patients with COPD will be significantly higher than the mean pre-test knowledge scores.
- **H$_2$:** There will be significant association between pre-test knowledge scores on pulmonary rehabilitation among patient with COPD and their selected demographic variables.

Conceptual framework

Conceptual framework used in this study is based on modified CIPP model by Daniel Stufflebeam that assess context, input, process, and product.

2. Methods

Research approach

A quantitative research approach was considered the best to assess the knowledge regarding pulmonary rehabilitation among patients with COPD.

Research design

A Pre-experimental research design (one group pre-test post-test only) was selected to assess knowledge regarding pulmonary rehabilitation among patients with COPD.

Research setting

Based on feasibility and availability of the samples, Tertiary Care Hospital, Varanasi was selected.

Population

Patients diagnosed with COPD.

Sample

COPD Patients admitted in selected Tertiary Care Hospital, Varanasi, U.P.

Sample size

50 patients diagnosed with COPD.

Sampling technique

Non-probability purposive sampling technique was used.

Sampling criteria

Inclusion criteria

- COPD patients able to read or write in English or Hindi.
- Patients with COPD who were admitted during data collection..
- COPD patients who were willing to participate in the study.

Exclusion criteria

- COPD patients who were on ventilator support.
- COPD patients who were unconscious.
- COPD patients with acute exacerbations

Variables

- Independent variable- Individual health teaching programme regarding pulmonary rehabilitation.
- Dependent variable- Knowledge of COPD patients regarding pulmonary rehabilitation.

Content validity

The validity of tool was checked by 9 experts from medical and nursing field.

Reliability

The reliability was checked by using Karl Pearsons' formula. Therefore, reliability of knowledge questionnaire was 0.83 which was considered as highly reliable.

Ethical consideration

Ethical permission was taken from the Institute research ethical committee board. Administrative permission was obtained from the head of the department, Tertiary Care Hospital, Varanasi. Consents were obtained from the samples and assured that the confidentiality would be maintained on the information given.

Pilot study

The pilot study was carried out in order to find the feasibility of the study. Ten sample's data were collected who met the inclusion criteria and exclusion criteria. Pilot study showed that the study was feasible.

Development and description of tool

It included 2 sections- Socio-demographic variables and self-structured questionnaire.

Socio-demographic variables:

Socio-demographic variable includes Age, gender, educational qualification, occupation, monthly income of the family, history of smoking, active smoking history, COPD treatment history, previous history of hospitalization and previous source of information on pulmonary rehabilitation.

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Self-structured questionnaire:
This tool is used to assess the level of knowledge of COPD patients regarding pulmonary rehabilitation. It consists of 25 questions regarding knowledge on pulmonary rehabilitation. The scoring ranges from 0 to 25 categorized by Very good, Good, Average and Poor level of knowledge.

3. Results

Table 1: Description of demographic variable of the participants (COPD Patients), (N=50)

S. No.	Demographic Variables	Frequency (f)	Percentage (%)
1	**Age (in years)**		
a.	30 – 40	0	0
b.	41 – 50	10	20
c.	51 -60	11	22
d.	Above 60	29	58
2	**Gender**		
a.	Male	32	64
b.	Female	18	36
3	**Educational qualification**		
a.	Primary education	37	74
b.	Secondary education	9	18
c.	Graduate	4	8
d.	Post Graduate and above	0	0
4	**Occupation**		
a.	Self employed	16	32
b.	Private employee	7	14
c.	Government employee	0	0
d.	Unemployed	27	54
5	**Family monthly income in Rs**		
a.	≤ 3000	32	64
b.	3001-6000	18	36
c.	6001-10000	0	0
d.	>10000	0	0
6	**History of smoking**		
a.	Active Smoking	32	64
b.	Passive smoking	13	26
c.	No history of smoking	5	10
7	**If active smoker-**		
a.	< 1 packet /day	8	25
b.	2-3 packets /day	17	53
c.	4-5 packets /day	7	22
d.	Above 6 packets /day	0	0
8	**Are you on regular treatment for COPD?**		
a.	Yes	36	72
b.	No	14	28
9	**Any previous history of hospitalization for COPD?**		
a.	Yes	43	86
b.	No	7	14
10	**Do you have previous information about pulmonary rehabilitation?**		
a.	Yes	8	16
b.	No	42	84

Table 1 depicts the description of demographic variables of the participants (COPD Patients).

Majority of COPD patients 58% were above 60 years, 22% were between 51-60 years and 20 % were between 41-50 years of age. Majority of the patients 64% were males and 36 % were females, among them 74% had primary education, 18 % had secondary education and 8% were graduates. Majority of COPD patients 54% were unemployed, 32% were self-employed and 14% were private employees. Among them majority 64% patient's family income was ≤ Rs.3000 and 36% patient's family income was between Rs.3001-6000.Majority 64% have history of active smoking &26% had history of passive smoking whereas 10% had no history of smoking. Among them majority 53% smoked 2-3 packets/ day, 25% smoked > 1 packet and 22% smoked 4-5 packets /day. Majority of patients 72% were on regular treatment for COPD, 28% was not on any treatment. 86% had previous history of hospitalization for COPD,14% doesnot had any history of hospitalization for COPD, Majority 84% doesnot had any previous information about pulmonary rehabilitation only 16% had previous information about pulmonary rehabilitation.

Table 2: Description of the pretest knowledge score regarding pulmonary rehabilitation among patients with COPD, (N=50)

Pretest Knowledge Scoring Criteria	Category (level of knowledge)	Frequency (f)	Percentage (%)	Mean	Median	S.D.
0-10	Poor	38	76			
11-15	Average	12	24	9.08	9	1.4117
16-20	Good	0	0			
21-25	Very good	0	0			

Table2. depicts the description of the pretest knowledge score regarding pulmonary rehabilitation among patients with COPD.

Majority of the COPD patients had poor level of knowledge comprising 76 %, a total of 12 patients comprising 24 % fell into average knowledge category.

Table 3: Description of the post test knowledge score regarding pulmonary rehabilitation among patients with COPD, (N=50)

Post test Knowledge Scoring Criteria	Category (level of knowledge)	Frequency (f)	Percentage (%)	Mean	Median	S.D.
0-10	Poor	0	00			
11-15	Average	4	08	18.1	18	1.775
16-20	Good	38	76			
21-25	Very good	8	16			

Table 3. Majority of the COPD patients 76% had good level of knowledge ,16% had very good level of knowledge. Only 8% patients had average level of knowledge which indicated that there was a significant increase in knowledge scores after administration of individual health teaching programme regarding pulmonary rehabilitation.

Table 4: Effectiveness of individual health teaching programme on knowledge regarding pulmonary rehabilitation among COPD patients, (N=50)

Category (level of knowledge)	Knowledge Scoring criteria	Pretest				Posttest				Mean Difference	t-value
		(f)	(%)	Mean	SD	(f)	(%)	Mean	S.D		
0-10	Poor	38	76	9.08	1.4	0	00	18.1	17.7	9.02	30.56*
11-15	Average	12	24			4	08				
16-20	Good	0	0			38	76				
21-25	Very good	0	0			8	16				

Table 4. The findings indicates that the **mean post-test knowledge score (18.1)** was higher than the **mean pre-test knowledge score (9.8)**, with a **mean difference of 9.02**. The **standard deviation (SD) of post-test knowledge score (17.7)** was higher than the **SD of pre-test knowledge score (1.4)**. A paired **t-test analysis yielded a 't' value of (30.56*)**, indicating a statistically significant improvement in knowledge scores. This suggests that the intervention was effective in enhancing knowledge of COPD patients regarding pulmonary rehabilitation.

Table 5: Chi-square test showing the association between pre-test knowledge score of COPD patients and selected demographic variables, (N=50)

S. No.	Variables	χ^2	P value	Inference
1	Age	0	0.4798	NS
2	Gender	3.004	0.083	NS
3	Education	0.033	0.8557	NS
4	Occupation	0.344	0.5577	NS
5	Family income	0.867	0.3517	NS
6	History of smoking	3.004	0.0831	NS
7	Taking regular treatment fir COPD	1.36	0.24630	NS
8	Previous Information about hospitalization for COPD	0	0.4798	NS

Table 5: Data presented in the table showed that there was no significant association between pretest knowledge scores regarding pulmonary rehabilitation with their selected demographic at 0.05 significant level.

4. Discussion

1) To assess the pretest knowledge score regarding pulmonary rehabilitation among patients with COPD.
Manoj et.al. (2025) conducted a study on Effectiveness of a Structured Teaching Programme On Knowledge Regarding Pulmonary Rehabilitation Among Patients with Chronic Obstructive Pulmonary Disease At A Selected Hospital. A quantitative evaluative approach using a one-group pre-test post-test design was selected. 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 (pretest) and 7 days after (post-test) the administration of the 45-minute STP. The mean pre-test knowledge score was (34.17%), indicating inadequate knowledge. Following the STP, the mean post-test score significantly increased to (76.00%). The paired t-test yielded a value of t=31.78 . 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.

2) To assess the post test knowledge score regarding pulmonary rehabilitation among patients with COPD
Riya et.al. (2023) conducted a study on effectiveness of planned teaching programme on Knowledge regarding Pulmonary Rehabilitation in COPD patients among Nursing Students in selected Nursing colleges to assess the level of knowledge regarding pulmonary rehabilitation in COPD patients among nursing students. Evaluative approach was selected for the study. Quasi-experimental (one group pretest and posttest) was selected for the study. 50 nursing students. A purposive sampling technique was used to select the sample for study. A structured questionnaire was used to collect data from the subjects. The obtained data was analyzed using descriptive and inferential statistics and interpreted in terms of objectives and hypothesis of the study. The level of significance was set at 0.05 levels. 88% of the nursing students obtained adequate level of information and 6% had a moderate level of knowledge. None of the staff nurses possessed inadequate level of knowledge. In the pretest the subjects had an inadequate knowledge where as in the post test all the subjects had gained adequate knowledge. The study findings indicate that PPT was effective enhancing the knowledge of nursing students regarding pulmonary rehabilitation in COPD patients.

3) To evaluate the effectiveness of individual health teaching programme on knowledge regarding pulmonary rehabilitation among patients with COPD.
Lakhmichand et.al. (2024) conducted a study to assess the effectiveness of individual health education on level of knowledge regarding pulmonary rehabilitation among patients with chronic obstructive pulmonary disease (COPD) in selected hospitals at Gwalior. An evaluative approach with pre-experimental one group pre-test post-test design was used for this study. The samples, 50 COPD patients, were selected by a non-probability purposive sampling technique. The data was analyzed using descriptive and inferential statistics. Paired 't' test was used to find the effectiveness of individual health education and chi-square was used to find the association of pre-test knowledge score with selected baseline variables. Results: The findings showed that the mean post test knowledge score (18.1) is higher than the mean pre test knowledge score (9.0833) after the individual health education. The mean difference between the mean post test and the mean pre test knowledge score was found to be statistically significant (t49 = 30.56) at 0.05 level of

significance. The individual health education was an effective method of increasing the knowledge of the COPD patients, on pulmonary rehabilitation.

5. Limitations

Conducting the study in a single tertiary care hospital limits the applicability of the results to other healthcare settings and the study's short follow-up period may not capture the long-term effects of the individual health teaching programme on the COPD patiemts.

6. Conclusion

The health teaching programme was found to substantially improve the knowledge of the patients, as evidenced by the marked increase in post-test scores compared to pre-test scores. This indicates that structured health teaching interventions can effectively enhance patient's understanding, which is crucial for the patient's health.

7. Recommendations

Incorporating true experimental designs, such as randomized controlled trials, will provide more robust evidence regarding the effectiveness of health teaching programme. Conducting similar studies across multiple geographic areas and healthcare settings will help determine the broader applicability of the teaching programme. Comparative studies evaluating the effectiveness of various educational methods (e.g., workshops, digital media, home visits) could identify the most efficient approaches for improving patient's knowledge.

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