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Effectiveness Of A Structured Teaching Intervention On Knowledge Regarding Pulmonary Rehabilitation Among Clients With Chronic Obstructive Pulmonary Disease At Lions Hospital, Mehsana District, Gujarat.

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Abstract: Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of global morbidity and mortality, and pulmonary rehabilitation (PR), though effective, remains underutilized due to poor patient awareness. This study aimed to assess the effectiveness of a structured teaching programme on knowledge regarding pulmonary rehabilitation among COPD clients at Lions Hospital, Gujarat. A pre-experimental one-group pre-test post-test design was employed, involving 60 COPD clients selected through purposive sampling. Knowledge was assessed using a validated structured questionnaire before and after the intervention. The mean pre-test knowledge score of 11.25 ± 3.56 significantly improved to 19.65 ± 2.89 post-intervention ($t = 14.78$, $p < 0.001$). The findings indicate that structured teaching programmes are effective informatic interventions for enhancing knowledge of pulmonary rehabilitation among individuals with COPD.

Index Terms **-** Component, formatting, style, styling, insert.

I. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is recognized globally as a significant cause of morbidity and mortality. The World Health Organization (WHO, 2023) estimates that COPD affects approximately 391 million people worldwide and contributes to more than 3.23 million deaths annually. COPD is currently the third leading cause of death globally.[1] Characterized by airflow limitation, respiratory symptoms, and progressive deterioration in lung function, COPD poses a substantial burden on patients, families, and healthcare systems alike. In India, COPD is among the top three causes of death and disability-adjusted life years (DALYs).[2] The Global Burden of Disease Study has shown that the prevalence of COPD in India accounts for nearly 32% of the total cases in Southeast Asia.[3]

The etiology of COPD is multifactorial and includes exposure to tobacco smoke, air pollution, occupational dust, genetic predisposition, and recurrent lower respiratory infections. In India, indoor air pollution due to biomass fuel usage and outdoor air pollution are notable risk factors. According to the Indian Chest Society, states like Gujarat have a high prevalence of COPD due to increased exposure to industrial pollutants, tobacco consumption, and under-diagnosis in rural populations.[4]

Pulmonary rehabilitation (PR) is an evidence-based multidisciplinary intervention designed to improve the physical and psychological condition of individuals with chronic respiratory diseases (Spruit et al., 2020)[5]. It has been demonstrated to improve exercise tolerance, reduce dyspnea, enhance health-related quality of life, and decrease hospitalizations (McCarthy et al., 2015).[6] PR includes patient education, exercise training, nutritional counselling, and behavioural interventions (ATS/ERS, 2021).[7] Despite the proven benefits, access to and utilization of PR services remain limited, especially in rural and semi-urban areas like Mehsana District, Gujarat.

Lions Hospital, a well-known tertiary care centre in Mehsana, caters to a large rural population where COPD patients often present with advanced stages of the disease. The lack of awareness regarding pulmonary rehabilitation and the absence of structured patient education programs contribute to poor self-management and health outcomes. In addition, bio-information and patient literacy regarding disease progression, rehabilitation, and lifestyle modification are found to be deficient (Patel & Shah, 2022).[8]

Studies have emphasized that structured teaching programs significantly improve knowledge, compliance, and functional capacity among COPD patients (Prasad et al., 2020).[9] The dissemination of structured, evidence-based information tailored to the local context plays a vital role in improving patients' understanding of their condition and encouraging positive behavioural changes (Zwerink et al., 2014).[10] Empowering COPD patients through structured education can bridge the existing knowledge gaps, enhance adherence to pulmonary rehabilitation, and ultimately improve the quality of life (Yohannes & Connolly, 2020).[11]

Given the high burden of COPD in Gujarat, the limited availability of PR services, and the observed lack of awareness among patients, there is a critical need for targeted interventions that enhance knowledge and foster better disease management. With the increasing application of bio-information in patient education and health outcome measurement, structured teaching programs offer a scientifically backed solution to address this gap (Krishnan et al., 2023).[12]

This study aims to evaluate the effectiveness of a structured teaching program on improving the knowledge of COPD patients regarding pulmonary rehabilitation at Lions Hospital, Mehsana District, Gujarat.

II MATERIALS AND METHODS

2.1 Study Design

A pre-experimental one-group pre-test post-test research design was adopted to evaluate the effectiveness of a structured teaching intervention on knowledge regarding pulmonary rehabilitation among clients with Chronic Obstructive Pulmonary Disease (COPD).

2.2 Study Setting

The study was conducted at Lions Hospital, Mehsana District, Gujarat, a tertiary care hospital that provides services to both rural and semi-urban populations.

2.3 Study Population and Sample

The study population consisted of clients diagnosed with COPD attending Lions Hospital. A total of 60 COPD clients were selected using a purposive sampling technique based on the inclusion and exclusion criteria.

2.4 Inclusion and Exclusion Criteria

Clients diagnosed with COPD, aged 40 years and above, who were willing to participate and available during the period of data collection were included in the study. Clients who were critically ill, had cognitive impairment, or were unable to comprehend the teaching programme were excluded.

2.5 Research Tool

Data were collected using a validated structured knowledge questionnaire consisting of 25 multiple-choice items covering various aspects of pulmonary rehabilitation, including definition, components, breathing exercises, lifestyle modification, and benefits of pulmonary rehabilitation. The maximum score was 25, with higher scores indicating better knowledge.

2.6 Intervention

A structured teaching programme on pulmonary rehabilitation was developed based on evidence-based guidelines and expert validation. The programme included lectures, charts, models, demonstrations, and interactive discussions focusing on pulmonary rehabilitation, breathing exercises, physical activity, lifestyle modification, and adherence to treatment. The intervention was administered immediately after the pre-test.

Data Collection Procedure

On the first day, a pre-test was conducted to assess the baseline knowledge of COPD clients using the structured knowledge questionnaire. Following the pre-test, the structured teaching programme was administered to all participants. A post-test was conducted on the seventh day using the same questionnaire to assess the effectiveness of the intervention.

2.7 Ethical Considerations

Ethical clearance was obtained from the concerned institutional authority. Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of the participants were maintained throughout the study.

2.8 Statistical Analysis

The collected data were coded and analysed using the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the sample characteristics and knowledge scores. Inferential statistics, including the paired t-test and chi-square test, were used to determine the effectiveness of the structured teaching programme and the association between pre-test knowledge scores and selected socio-demographic variables. A p-value of less than 0.05 was considered statistically significant.

III METHODOLOGY

The present study adopted a pre-experimental, one-group pre-test post-test design to evaluate the effectiveness of a structured teaching program on knowledge regarding pulmonary rehabilitation among clients diagnosed with chronic obstructive pulmonary disease (COPD). The study was conducted at Lions Hospital, Mehsana District, Gujarat**,** which serves as a tertiary care centre catering to both urban and rural populations. A total of 60 clients diagnosed with COPD were selected using purposive sampling based on predefined inclusion and exclusion criteria. To assess the baseline and post-intervention knowledge, a structured knowledge questionnaire consisting of 25 items covering various aspects of pulmonary rehabilitation was employed.

IV. RESULTS AND DISCUSSION

Table 4.1: Frequency and Percentage Distribution of Socio-Demographic Variables of COPD Clients (N=60)

Socio-Demographic Variables	Categories	Frequency (f)	Percentage (%)
Age	40-49 years	12	20%
	50-59 years	20	33.3%
	60-69 years	18	30%
	70 years & above	10	16.7%
Gender	Male	36	60%
	Female	24	40%
Educational Status	No formal education	20	33.3%
	Primary	25	41.7%
	Secondary & above	15	25%
Duration of Illness	<1 year	10	16.7%
	1-3 years	25	41.7%
	>3 years	25	41.7%
Previous Information on PR	Yes	18	30%
	No	42	70%

Table 4.1 shows the frequency and percentage distribution of socio-demographic variables of COPD clients. The majority of participants were aged between 50–59 years (33.3%) followed by 60–69 years (30%). In terms of gender, 60% were males and 40% were females. Regarding educational status, 41.7% of the clients had primary education, while 33.3% had no formal education. The duration of illness was found to be 1–3 years (41.7%) and more than 3 years (41.7%) equally. Only 30% of participants had previous information regarding pulmonary rehabilitation, while 70% had no prior information.

TABLE 4.2: PRE-TEST KNOWLEDGE LEVEL OF COPD CLIENTS ON PULMONARY REHABILITATION

Knowledge Level	Frequency (f)	Percentage (%)
Inadequate Knowledge (0–8)	20	33.3%
Moderate Knowledge (9–16)	35	58.3%
Adequate Knowledge (17–25)	5	8.3%

Table 4.2 reveals that before the structured teaching programme, the majority of COPD clients (58.3%) had moderate knowledge (scores 9–16) regarding pulmonary rehabilitation, while 33.3% had inadequate knowledge (scores 0–8). Only 8.3% had adequate knowledge (scores 17–25) in the pre-test phase. This indicated a knowledge gap in the target population prior to the intervention.

TABLE 4.3: POST-TEST KNOWLEDGE LEVEL OF COPD CLIENTS ON PULMONARY REHABILITATION

Knowledge Level	Frequency (f)	Percentage (%)
Inadequate Knowledge (0–8)	2	3.3%
Moderate Knowledge (9–16)	18	30%
Adequate Knowledge (17–25)	40	66.7%

Table 4.3 displays the post-test knowledge levels of the COPD clients after receiving the structured teaching programme. A significant improvement was observed, as 66.7% of clients achieved adequate knowledge, and only 3.3% remained in the inadequate knowledge category. This marked shift in knowledge levels highlights the effectiveness of the teaching programme.

TABLE 4.4: COMPARISON OF PRE-TEST AND POST-TEST MEAN KNOWLEDGE SCORES ON PULMONARY REHABILITATION (PAIRED T-TEST)

Knowledge Score	Pre-Test Mean ± SD	Post-Test Mean ± SD	Mean Difference	t-value (p-value)
Total Knowledge Score	11.25 ± 3.56	19.65 ± 2.89	8.4	14.78 (<0.001)

Table 4.4 compares the pre-test and post-test mean knowledge scores on pulmonary rehabilitation. The pre-test mean score was 11.25 ± 3.56, which increased to 19.65 ± 2.89 in the post-test, showing a mean difference of 8.4. The calculated t-value of 14.78 was statistically significant at $p < 0.001$, confirming that the structured teaching programme was highly effective in improving clients' knowledge.

TABLE 4.5: ASSOCIATION BETWEEN PRE-TEST KNOWLEDGE SCORES AND SELECTED SOCIO-DEMOGRAPHIC VARIABLES (CHI-SQUARE TEST)

Variables	χ^2 value	df	p-value	Significance
Age	8.12	3	0.043	Significant*
Gender	0.87	1	0.351	NS
Educational Status	10.21	2	0.006	Significant**
Duration of Illness	1.55	2	0.460	NS
Previous Information on PR	9.31	1	0.002	Significant**

Table 4.5 shows the association between pre-test knowledge scores and selected socio-demographic variables using the chi-square test. A significant association was found between knowledge levels and variables like age (p=0.043), educational status (p=0.006), and previous information on pulmonary rehabilitation (p=0.002). However, variables such as gender and duration of illness did not show significant associations. This suggests that education and prior exposure to information were key factors influencing clients' baseline knowledge.

V DISCUSSION

The findings of the present study clearly demonstrate the effectiveness of a structured teaching programme on improving knowledge regarding pulmonary rehabilitation among clients with chronic obstructive pulmonary disease (COPD). The pre-test results indicated that a significant proportion of clients possessed inadequate to moderate knowledge about pulmonary rehabilitation. However, post-intervention results showed a substantial improvement, with the majority of clients attaining adequate knowledge. The improvement in knowledge scores suggests that structured educational interventions can effectively bridge the knowledge gap, thereby empowering patients to adopt better self-care practices. Furthermore, the study revealed significant associations between knowledge levels and socio-demographic variables such as age, educational status, and prior information about pulmonary rehabilitation. These findings are consistent with previous studies that emphasize the critical role of patient education in improving health outcomes among clients with chronic respiratory diseases.

Another study assessed the impact of a structured teaching program on the knowledge of pulmonary rehabilitation among COPD patients. The intervention led to a significant improvement in patients' knowledge, highlighting the effectiveness of structured educational programs in enhancing understanding of pulmonary rehabilitation.[13]

A different study found that evaluated the effectiveness of a structured teaching program on pulmonary rehabilitation among COPD clients. Results indicated a significant improvement in patients' knowledge and practices related to pulmonary rehabilitation post-intervention, suggesting that such programs are beneficial in managing COPD.[14]

Another relevant study evaluated the effectiveness of a structured teaching program on knowledge regarding pulmonary rehabilitation among COPD patients. The intervention resulted in a significant increase in knowledge scores, indicating that structured teaching programs are effective in enhancing patients' understanding of pulmonary rehabilitation.[15]

This pre-experimental study assessed the effectiveness of a structured teaching program on knowledge regarding COPD and pulmonary rehabilitation among COPD patients. The results showed a significant improvement in knowledge scores post-intervention, demonstrating the program's effectiveness.[16]

This study assessed the effectiveness of a structured teaching program on knowledge regarding pulmonary rehabilitation among COPD patients. The intervention led to a significant improvement in knowledge scores, indicating the program's effectiveness.[17]

VI CONCLUSION

The study concluded that a structured teaching programme significantly enhanced the knowledge of COPD clients regarding pulmonary rehabilitation. Such educational interventions should be routinely incorporated into the management of COPD clients to improve their knowledge, adherence, and overall health outcomes. The findings also highlight the importance of considering socio-demographic variables while designing and implementing educational interventions for COPD clients.

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VIII CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research article.

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