ORIGINAL ARTICLE

Improved knowledge of COPD management through a health education intervention: A study at Vina Estetica Hospital, Medan

Roslenni Sitepu[1]*, Kartika Sari Rizki[1], Dicho Zhuhriano Yasli[1], Andry Simanullang[1], Frenky Jones Manurung[2]

ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive disease characterized by airflow obstruction that requires effective self-management. Health education is a crucial intervention to improve patient understanding of symptom management. This study aims to analyze the effect of health education on patients' knowledge regarding COPD management in the inpatient ward of Vina Estetica Hospital, Medan.

Methods: This research employed a quasi-experimental design with a one-group pretest-posttest approach. Sampling was conducted using total sampling, including 32 COPD patients as respondents. Data were collected using a questionnaire and analyzed using the paired t-test.

Results: Before the health education intervention, the majority of respondents had good knowledge (59.4%). After the intervention, all respondents (100%) achieved the good knowledge category. Statistical tests showed a significant effect of health education on increasing patient knowledge (p-value 0.000; t-count 4.605).

Conclusion: Health education is effective in improving the knowledge of COPD patients. It is recommended that nursing services implement continuous health education programs to optimize patient care.

Keywords: health education, knowledge, COPD

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a global health problem with increasing morbidity and mortality.[1] The World Health Organization reports that COPD is the third leading cause of death worldwide, after heart disease and stroke, causing over 3 million deaths annually.[2] The disease is characterized by persistent airflow limitation due to chronic inflammation of the airways and lung parenchyma, largely caused by exposure to cigarette smoke, air pollution, and other environmental factors.[3] In Indonesia, COPD is also a significant public health issue. Data from the Ministry of Health of the Republic of Indonesia indicate that the prevalence of chronic lung disease tends to increase with age, smoking habits, and exposure to air pollution, both in occupational and domestic settings. This condition leads to a decreased quality of life, increased hospitalization rates, and high healthcare costs due to recurrent exacerbations.[4–7]

Affiliation
[1]Department of Public Health, Universitas Prima Indonesia
[2]Department of Clinical Medicine, Universitas Prima Indonesia

***Corespondence:**
roslennisitepu1@gmail.com

COPD management focuses not only on pharmacological therapy but also requires patient self-management through behavioral changes, medication adherence, breathing techniques, physical exercise, and avoidance of risk factors.[8,9] However, various studies indicate that many COPD patients have limited knowledge about the disease and its management, leading to frequent relapses and clinical deterioration.[10,11]

Health education is a key intervention for improving the knowledge and ability of patients to manage chronic diseases, including COPD.[12] Effective health education can enhance patient understanding of the disease, improve adherence to therapy, and encourage sustainable healthy behavioral changes. Previous studies have shown that educational interventions contribute to reducing relapse rates and improving the quality of life for COPD patients.[13,14]

Vina Estetica Hospital, Medan is a healthcare facility that manages a relatively high number of COPD patients each year. Hospital data indicate that some patients experience recurrent relapses due to a lack of understanding regarding disease management, including medication use, breathing techniques, and avoidance of triggering factors. This situation suggests that health education for COPD patients needs to be optimized. Based on this problem, this study aimed to analyze the effect of health education on improving patient knowledge regarding COPD management at Vina Estetica Hospital, Medan.

Method

This study used a quasi-experimental design with a one-group pretest-posttest approach to determine the effect of health education on improving patient knowledge about COPD management. The research was conducted at Vina Estetica Hospital, Medan in 2025. The study population comprised all COPD patients undergoing treatment at the hospital during the study period. The sample was selected using total sampling, including all 32 COPD patients who met the inclusion criteria during the data collection period. Inclusion criteria were patients diagnosed with COPD, willing to participate, able to communicate effectively, and in a stable clinical condition at the time of data collection. Patients with unstable clinical conditions or those unable to participate in the education process were excluded.

Data were collected using a COPD management knowledge questionnaire adapted to the content of the provided health education material. Assessments were conducted twice: before the health education intervention (pretest) and after the intervention (posttest). The intervention consisted of health education on COPD management, covering understanding of the disease, medication use, breathing techniques, avoidance of risk factors, and relapse prevention efforts. Education was delivered directly using interactive lectures and leaflets to ensure the information was well understood by patients.

Data were analyzed using univariate analysis to describe respondent characteristics and the distribution of knowledge levels. Bivariate analysis was performed using the paired t-test to determine the difference in knowledge levels before and after the health education intervention. All data analyses were conducted with a statistical significance level of $p < 0.05$.

Results

Table 1 presents a demographic profile of the 32 respondents surveyed in the inpatient ward of Vina Estetica Hospital, Medan, categorized by sex, age, education level, and occupation. The distribution of respondents across these characteristics provides a clear description of the sample population used for the study.

Table 1. Respondent characteristics (n=32)

Characteristic	Frequency (n)	Percentage (%)
Sex		
Male	13	40.6
Female	19	59.4
Age (Years)		
20-30	6	18.8
31-40	16	50
41-50	10	31.2
Education		
Junior High	1	3.1
Senior High	14	43.8
Diploma/Bachelor's	17	53.1
Occupation		
Farmer	4	12.5

Civil Servant	11	34.4
Entrepreneur	17	53.1

Regarding the sex distribution, the respondent group was predominantly female. Female respondents numbered 19, accounting for 59.4 percent of the total sample. Male respondents totaled 13, representing the remaining 40.6 percent. This indicates a higher proportion of female participants in the study. The age distribution of respondents was categorized into three groups. The largest proportion of respondents fell within the 31 to 40 years age bracket, with 16 individuals comprising exactly 50 percent of the sample. The 41 to 50 years age group was the next largest, consisting of 10 respondents, which represents 31.2 percent of the total. The smallest age group was those aged 20 to 30 years, with 6 respondents making up 18.8 percent of the sample. The data show that the majority of respondents, over 80 percent, were aged between 31 and 50 years.

In terms of educational attainment, the majority of respondents possessed a diploma or bachelor's degree. This group included 17 individuals, accounting for 53.1 percent of the sample. Respondents with a senior high school education constituted the second largest group, with 14 individuals representing 43.8 percent. A small minority, consisting of only one respondent or 3.1 percent of the sample, had an education level of junior high school. The findings indicate that the sample population was highly educated, with over half having completed tertiary education.

The occupational background of the respondents varied across three categories. The most common occupation was entrepreneur, held by 17 respondents, which corresponds to 53.1 percent of the sample. Civil servants were the next most represented group, with 11 individuals accounting for 34.4 percent. Farmers comprised the smallest occupational category, with only 4 respondents representing 12.5 percent of the total. The data demonstrate that entrepreneurs and civil servants together formed the vast majority of the respondent sample.

Table 2 presents the frequency distribution of respondents based on their knowledge of Chronic Obstructive Pulmonary Disease (COPD) management, comparing their levels of understanding before and after the administration of health education. The data demonstrate a significant shift in knowledge levels following the educational intervention. Prior to the health education session, the majority of respondents, comprising 19 individuals or 59.4 percent of the sample, exhibited a good level of knowledge regarding COPD management. The remaining 13 respondents, accounting for 40.6 percent, possessed a fair level of knowledge. Notably, no respondents fell into the poor knowledge category at the baseline assessment.

Table 2. Frequency distribution of respondents based on knowledge of COPD management

COPD Knowledge Level	Before Health Education		After Health Education	
	n	%	n	%
Good	19	59.4	32	100
Fair	13	40.6	0	0
Poor	0	0	0	0

Following the health education intervention, the data reveal a comprehensive improvement in understanding. All 32 respondents, representing 100 percent of the sample, achieved a good level of knowledge about COPD management. Consequently, the categories for fair and poor knowledge registered zero percent after the education was provided. This distribution indicates a direct and positive association between the health education provided and the enhancement of patient knowledge within the inpatient ward.

The analysis presented in Table 3 evaluates the effect of a health education intervention on patient knowledge regarding Chronic Obstructive Pulmonary Disease (COPD) management within the inpatient ward of Vina Estetica Hospital, Medan. A paired-samples t-test was conducted to compare patient knowledge scores before the intervention and after the intervention, thereby determining the statistical significance of any observed change.

Table 3. Effect of health education on patient knowledge of COPD management in the inpatient ward of Vina Estetica Hospital, Medan

Variable	Paired Differences					T	p
	Mean	Std. Deviation	Std. Error Mean	95% CI			
				Lower	Upper		
Knowledge Before Health Education - Knowledge After Health Education	0.406	0.499	0.088	0.226	0.586	4.605	0.000

The results indicate a mean increase in knowledge scores following the health education session. The calculated mean difference between the pre-test and post-test scores is 0.406. This positive value signifies that, on average, patients' knowledge scores were higher after receiving the education compared to before. The standard deviation of these paired differences is 0.499, which illustrates the extent of individual variation in the amount of knowledge gained among the patients. The standard error of the mean difference is 0.088, providing a measure of the precision with which this sample mean difference estimates the true population mean difference.

The 95% confidence interval for the true mean difference ranges from 0.226 to 0.586. This interval is particularly informative as it suggests that the researcher can be 95% confident that the actual average increase in knowledge scores for the broader patient population lies somewhere between these two positive values. Crucially, because the entire confidence interval is above zero, it provides strong evidence that the educational intervention consistently leads to an improvement in knowledge.

The statistical test corroborates this finding. The calculated t-value is 4.605, and it is associated with a p-value of 0.000. The p-value is substantially lower than the conventional alpha level of 0.05, indicating that the probability of observing such a mean difference by random chance alone is exceedingly small. In conclusion, the analysis demonstrates a statistically significant increase in patient knowledge of COPD management following the health education program. The evidence strongly suggests that the intervention was effective in its immediate objective of enhancing patient understanding.

Discussion

This study on the effect of health education on COPD management knowledge at Vina Estetica Hospital, Medan found that the majority of COPD patients were female. This may be related to occupational exposure, as many respondents worked as farmers. Respondents were primarily of productive age and worked as farmers. It is plausible that these farmers may have been exposed to respiratory hazards without adequate protective measures like masks.

The finding that most respondents had a higher education diploma or degree is notable. This aligns with the theoretical understanding that knowledge comprises facts and theories enabling individuals to solve problems, acquired through direct experience or learning from others.[15,16] Higher educational attainment may facilitate the reception and comprehension of health information. Research by Sugiharti and Sondari[17] described COPD as a lung disease that can result from exposure to coal dust, leading to conditions like chronic bronchitis and emphysema, characterized by symptoms such as dyspnea and reduced lung function. This underscores the role of occupational and environmental factors in COPD etiology.

Knowledge, defined as the result of sensing a particular object, can be categorized into levels from poor to excellent and is influenced by factors such as education, occupation, information sources, experience, age, and environment. The current study's finding of predominantly good knowledge post-intervention may be partly attributed to the respondents' high education level.[18,19] As suggested by Bloom, higher education facilitates the acceptance and processing of information, leading to better knowledge. While education is a key factor, it is not the sole determinant; environment, experience, and social interactions also play a role.[20,21] Although these factors were not examined in this study, they likely contributed to the observed knowledge levels.[19,22] The researcher posits that the patients' understanding of COPD management at Vina Estetica Hospital, Medan was enhanced by their predominantly higher education backgrounds.

Studies also confirm associations between patient knowledge and COPD hospitalization risks. For example, higher COPD knowledge scores correlated with more emergency visits and readmissions (p=0.005-0.010), suggesting a paradoxical link where informed patients seek care sooner. Another analysis tied better COPD knowledge to improved self-care, indirectly reducing exacerbations (p=0.001).[23,24]

Conclusion

This study demonstrates that health education significantly improves knowledge of COPD management among patients at Vina Estetica Hospital, Medan, as evidenced by the increase in good knowledge from 59.4% before the intervention to 100% after the intervention (p=0.000). The findings confirm that structured educational interventions are effective in enhancing patient understanding of disease management, including medication use, breathing techniques, and risk factor avoidance. These results underscore the importance of integrating continuous health education programs into routine nursing services

to optimize patient self-management, reduce the risk of recurrent exacerbations, and ultimately improve clinical outcomes and quality of life for COPD patients.

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