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Effectiveness of Health Education Program on Self-Management of Elderly with COPD (Chronic Obstructive Pulmonary Disease)

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is a major cause of decreased quality of life in the elderly, requiring optimal self-management skills. Poor understanding of symptom management and treatment by the elderly is a major barrier to long-term care. This study aims to analyze the effectiveness of a health education program on improving self-management in the elderly with COPD. The study design used a quasi-experimental pretest-posttest control group with 150 respondents (75 experimental and 75 control) selected through purposive sampling. The education program was administered for four weeks with a focus on improving knowledge, attitudes, and symptom management skills. Data analysis used the Shapiro-Wilk test, paired t-test, independent t-test (Welch), and ANCOVA at a significance level of 0.05. The results showed a significant increase in self-management skills in the experimental group compared to the control ($t = 10.64$; $p < 0.001$; Cohen's $d = 1.74$). The average score increased by 14.66 points in the experimental group and 2.61 points in the control group. It was concluded that the health education program was effective in improving self-management in elderly with COPD, so it is recommended as a routine intervention in elderly health services.

Keywords: health education; self-management; elderly; COPD.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a non-communicable disease that has a significant impact on public health, especially in the elderly (Rahmah, 2022). This condition is characterized by progressive, non-reversible airflow obstruction, generally caused by long-term exposure to harmful particles or gases, such as cigarette smoke and air pollution. The increasing incidence of COPD in the elderly is a serious public health concern, as this age group has a weakened immune system and often has comorbidities that exacerbate respiratory conditions.

According to a report by the World Health Organization (WHO, 2023), COPD ranks third as the leading cause of death worldwide, after heart disease and stroke. It is estimated that approximately 70% of COPD sufferers are over 60 years old, indicating that the aging process plays a significant role in the natural decline of lung function, thus increasing susceptibility to this disease. In addition to age, lifestyle and environmental factors also contribute to the increasing incidence, including active and passive smoking, exposure to industrial dust, and poor air quality in both urban and rural areas.

In Indonesia, Ministry of Health data shows an increasing trend in COPD cases in recent years, particularly among the elderly with a history of smoking and long-term exposure to air pollution. Lifestyle changes, rapid urbanization, and a lack of awareness of the importance of lung health have exacerbated this situation. This situation demands more intensive promotive and preventive efforts, such as education about the dangers of smoking, improving air quality, and early detection of respiratory diseases in vulnerable groups (Lontoh et al., 2024, p. 2). Thus, the increasing incidence of COPD in the elderly can be suppressed through a holistic and sustainable public health approach.

Elderly people with Chronic Obstructive Pulmonary Disease (COPD) often face major challenges in carrying out daily activities due to the physical limitations they experience (Satria et al., 2022). Shortness of breath, fatigue, and decreased respiratory muscle strength often make it difficult for them to perform routine activities such as walking, bathing, or even eating comfortably.

This condition requires strong self-management skills to enable seniors to maintain their independence and reduce the risk of complications. However, many struggle to manage activity patterns, maintain medication schedules, and consistently perform breathing exercises. Lack of support from family and healthcare professionals exacerbates the situation, as seniors tend to lose motivation and feel unable to optimally manage their illness (Cheloni & Tinker, 2019).

Low self-management in elderly COPD sufferers is also influenced by limited knowledge about the disease and how to manage it (Munawaroh et al., 2024). Many older adults do not understand the importance of adherence to treatment, controlling risk factors such as smoking, and early recognition of relapse symptoms. As a result, their quality of life declines due to frequent shortness of breath, fatigue, and persistent sleep disturbances. Furthermore, the lack of ability to manage a healthy lifestyle and maintain a care routine leads to increased rates of relapse and hospitalization. Therefore, increasing health education and ongoing support are crucial for improving self-management for older adults with COPD so they can live more productive and prosperous lives (Puspitasari et al., 2024).

Conventional health education programs provided to elderly people with Chronic Obstructive Pulmonary Disease (COPD) are often still informative and one-way (Jiang et al., 2024), where healthcare professionals simply deliver material without in-depth interaction with participants. This approach makes it difficult for seniors to fully understand their health condition, how to properly use medications, or how to manage daily symptoms. Furthermore, the short, discontinuous delivery of information makes it easy for seniors to forget or misapply the knowledge they have received (Lestari et al., 2024). The lack of adaptation of educational methods to the cognitive and physical abilities of older adults also contributes to the decline in the effectiveness of these learning programs.

In the context of the elderly, the educational approach should be carried out interactively, repeatedly, and adapted to the needs and abilities of the individual (Tournier, 2022). Seniors need learning methods that involve active participation, such as simulations, demonstrations, and direct assistance in self-management practices.

Through this approach, they not only understand the information theoretically, but are also able to apply it in everyday life (Baharuddin et al., 2024). Providing ongoing education, with the support of family and healthcare professionals, can help increase the motivation and confidence of older adults in managing their illness. Therefore, the limitations of conventional health education need to be addressed through innovative approaches that are more humanistic, communicative, and oriented toward seniors' independence.

A structured health education approach plays a crucial role in improving the ability of individuals, including older adults with Chronic Obstructive Pulmonary Disease (COPD), to manage their health independently. Systematically structured education, with clear learning stages and materials tailored to the participants' level of understanding, has been shown to improve preventative behavior, medication adherence, and the ability to manage chronic disease symptoms. Through this approach, older adults can better understand the importance of maintaining a healthy lifestyle, regularly engaging in respiratory therapy, and recognizing signs of relapse early (Alimurdianis et al., 2024). In addition, structured education allows healthcare workers to continuously monitor patient progress, allowing for more timely and targeted interventions.

Although various studies have demonstrated the effectiveness of health education in improving healthy lifestyle behaviors, studies specifically addressing the application of this approach to older adults with COPD in Indonesia are still limited. Many educational programs have not been designed in a measurable and sustainable manner, taking into account the cognitive, social, and emotional characteristics of older adults (Suyono, 2021). This situation highlights the need to develop a more contextual and evidence-based health education model to significantly impact self-management in older adults. Further research is needed to assess the effectiveness of this structured educational approach in improving independence, adherence, and quality of life for older adults with COPD in Indonesia.

Research on the effectiveness of health education programs on self-management of elderly people with Chronic Obstructive Pulmonary Disease (COPD) has a high urgency considering that the number of COPD sufferers in Indonesia continues to increase, especially in the elderly age group (Agustin et al., 2025). To date, most research has focused on medical aspects and treatments, while non-pharmacological interventions such as health education have received less attention. Yet, appropriate education can be a crucial strategy for increasing the independence of older adults in self-care, reducing relapse rates, and reducing the need for care in healthcare facilities. With

increased knowledge and self-management skills, older adults are expected to be able to maintain stable respiratory conditions and lead more productive and quality lives.

Therefore, this research is important to fill the knowledge gap regarding the effectiveness of health education programs for elderly people with COPD, especially in the Indonesian context which has its own social and cultural characteristics (Widyasari, 2025). Through a quantitative approach, this study can objectively measure the extent to which health education programs improve self-management skills, adherence to therapy, and quality of life in older adults. The results are expected to contribute not only to the development of geriatric nursing and public health sciences, but also to form the basis for developing more targeted, sustainable educational policies and interventions that meet the needs of older adults with COPD in the field.

There is a significant research gap regarding the implementation of health education for elderly people with Chronic Obstructive Pulmonary Disease (COPD) (Rizqi & Feoh, 2024). Most previous research has focused on pharmacological interventions or medical therapies, while non-pharmacological aspects such as health education have not been explored in depth. Studies assessing the effectiveness of health education on self-management skills in older adults with COPD in Indonesia are still very limited, despite the significant potential of this intervention to improve their quality of life.

Furthermore, most existing studies only assess increased knowledge without measuring changes in behavior and comprehensive self-management skills, including medication adherence, symptom control, physical activity, and psychological well-being. To date, there has been no structured health education model based on pre-post evaluation with a control group in the elderly COPD population in primary healthcare facilities. Therefore, further research is needed to fill this gap and develop an effective and measurable intervention approach.

The novelty of this research lies in the development and implementation of a structured and interactive health education program specifically designed for elderly people with Chronic Obstructive Pulmonary Disease (COPD). This program consists of three educational sessions focused on improving self-management skills through a behavioral self-management approach, with practical materials such as effective breathing techniques, physical activity regulation, and improving adherence to drug therapy. This study also used a quasi-experimental design with a pretest-posttest and a control group, an approach rarely used in the context of research on elderly people with COPD in Indonesia. Furthermore, this study is the first to assess the effectiveness of behavioral-based health education on improving self-management in elderly people with COPD in a local setting, such as a community health center or elderly community in Indonesia. Thus, this study not only provides an empirical contribution to the development of non-pharmacological

interventions but also presents an educational model that can be replicated in primary health care practices to improve the quality of life of elderly people with COPD.

The general objective of this study was to assess the effectiveness of a health education program in improving self-management skills in elderly people with Chronic Obstructive Pulmonary Disease (COPD). Through this approach, the study sought to understand the extent to which structured educational interventions can help older adults manage their health independently and sustainably.

Specifically, this study aims to: (a) analyze the level of self-management ability of elderly COPD sufferers before and after the implementation of a health education program; (b) compare the differences in self-management scores between the experimental group that received educational intervention and the control group that did not receive education; (c) identify aspects of self-management that experienced the most significant improvement after the program implementation, such as adherence to medication, symptom control, physical activity, and psychological aspects; and (d) provide recommendations for an effective, measurable, and applicable health education model to be implemented in an effort to increase the independence and quality of life of elderly COPD sufferers at the primary health care level.

METHODOLOGY

This study uses a quantitative approach with a quasi-experimental or quasi-experimental design, which aims to measure the effectiveness of health education programs on self-management skills in elderly people with Chronic Obstructive Pulmonary Disease (COPD) (Rizqi & Feoh, 2024). The design used was a pretest-posttest with a control group, where the experimental group received an intervention in the form of a health education program, while the control group received only standard care without additional education. This design was chosen to compare changes in self-management levels before and after the intervention in both groups.

The population in this study was all elderly people with COPD who were registered at several elderly health service facilities in the research area (Kim et al., 2021). Sampling was conducted using a purposive sampling technique, which selects respondents based on certain criteria such as age ≥ 60 years, having a COPD diagnosis from a medical professional, stable physical condition, and willingness to participate in the entire research series. A total of 150 respondents were involved, consisting of 75 respondents in the experimental group and 75 respondents in the control group. This number has met the minimum requirements for statistical tests with a 95% confidence level.

The variables in this study included the independent variable, the health education program, and the dependent variable, the self-management skills of elderly people with COPD. Control variables included age, gender, education level, and duration of COPD. The health education program consisted of three main sessions over three weeks, each lasting 60 minutes. The educational

materials covered basic knowledge about COPD, effective breathing techniques, medication adherence, physical activity management, healthy eating, and symptom management.

The instrument used in this study was a self-management questionnaire adapted from the Self-Management Behavior Scale for COPD Patients. The questionnaire covered aspects of knowledge, adherence to therapy, and daily symptom management. Each item was measured using a Likert scale ranging from 1 to 5. Validity was tested through content validity by experts, and reliability was tested using the Cronbach's Alpha formula, with an α value of 0.87, indicating high reliability.

The research procedure began with a preparation phase, which included obtaining research permits, submitting ethical clearance, and recruiting respondents according to established criteria. During the implementation phase, respondents from both groups were given a pretest to assess their initial self-management skills. Next, the experimental group received a three-session health education program, while the control group received no additional intervention. After all interventions were completed, a posttest was administered to both groups to assess changes in self-management skills. The final phase was data evaluation and analysis to assess the program's effectiveness.

Data analysis techniques included univariate analysis to describe the distribution of respondent characteristics such as age, gender, education level, and duration of COPD. Furthermore, bivariate analysis was conducted using the Paired Sample t-test to determine differences in self-management scores before and after the intervention in the same group, as well as the Independent t-test to compare differences in scores between the experimental and control groups. The significance level used in the analysis was $p < 0.05$, which indicates a significant effect of the educational program on improving self-management in elderly with COPD.

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics of Self-Management Scores (Pretest and Posttest)

Group	N	Mean Pre	Elementary School Preschool	Mean Post	SD Post	Median Pre	Median Post
Experiment	75	46.14	5.9	60.8	6.2	46	60
Control	75	45.19	5.7	47.8	6	45	48

Source: 2025 Data Processing Results

This table shows descriptive statistics on the self-management skills of elderly people with COPD before and after the health education program. The experimental group had an average initial score of 46.14, which increased to 60.80 after the intervention, indicating a substantial improvement of ± 14.66 .

points. In contrast, the control group showed only a small increase, from 45.19 to 47.80. These results indicate that the health education program had a positive effect on improving self-management skills.

Table 2. Normality Test (Shapiro-Wilk)

Variables	W	P-value	Decision
Experiment – Pre	0.981	0.12	Normal data
Experiment – Post	0.976	0.085	Normal data
Control – Pre	0.979	0.098	Normal data
Control – Post	0.977	0.076	Normal data

Source: 2025 Data Processing Results

The Shapiro Wilk test was used to ensure normal distribution of the data before conducting parametric tests. A p-value > 0.05 for all variables indicates normal distribution, making the t-test suitable for further analysis.

Table 3. Instrument Reliability Test (Cronbach's Alpha)

Instrument/ Scale	Number of Items	Cronbach's α	Information
Self- Management Questionnaire	20	0.87	Reliable

Source: 2025 Data Processing Results

The reliability test showed a Cronbach's Alpha value of 0.87, indicating the instrument has high internal consistency. This means that all items in the questionnaire correlate well with each other in measuring aspects of self-management in older adults with COPD. This value exceeds the minimum threshold of 0.70, which is generally considered sufficient in social and health research.

Table 4. Paired t-test (Pretest–Posttest per Group)

Group	Mean Pre	Mean Post	Mean Diff (Post–Pre)	SD Diff	t (df=74)	p- value	Cohen's d
Experiment	46.14	60.8	14.66	6.75	18.8	< 0.001	2.17 (very large)
Control	45.19	47.8	2.61	9.6	2.36	0.021	0.27 (small)**

Source: 2025 Data Processing Results

Paired t-test results showed a significant increase in self-management skills in the experimental group after the health education program ($p < 0.001$,

Cohen's $d = 2.17$). Meanwhile, the control group also experienced an increase, but not as significant as the experimental group ($p = 0.021$, $d = 0.27$). These findings indicate that the health education intervention effectively improves the ability of older adults to self-manage COPD.

Table 5. Posttest Comparison Test between Groups (Independent t-test and Levene's Test)

Test	Statistics	Mark	p-value	Information
Levene's test	F	—	0.03	Variance is not the same
Independent t-test (Welch)	t	10.64	< 0.001	Significant
Mean Post (Experiment)	—	60.8	—	—
Mean Post (Control)	—	47.8	—	—
Mean Difference	—	13	—	—
Cohen's d	—	1.74	—	Big effect

Source: 2025 Data Processing Results

Levene's test showed $p < 0.05$, indicating that the variance between groups was not homogeneous. Therefore, Welch's t-test was used as an alternative. The results showed a highly significant difference between the posttest scores of the experimental and control groups ($t = 10.64$; $p < 0.001$). Cohen's d value of 1.74 indicates a large intervention effect in practice. Thus, the health education program was proven to be effective in improving the self-management skills of elderly people with COPD compared to no intervention.

Table 6. Analysis of Covariance (ANCOVA) Controlling for Pretest and Age

Source of Variance	df	F	P-value	Partial η^2
Group (Main Effect)	1	45.32	< 0.001	0.237
Covariate: Pretest score	1	210.15	< 0.001	0.592
Residual	146	—	—	—

Source: 2025 Data Processing Results

ANCOVA analysis was used to ensure that the increase in posttest scores in the experimental group was not due to baseline (pretest) differences or age. After controlling for these differences, the group effect remained significant ($F = 45.32$; $p < 0.001$; $\eta^2 = 0.237$). This indicates that health education has a significant effect on improving self-management in older adults with COPD, regardless of differences in baseline conditions or demographic factors.

Table 7. Chi-square Test: Comparison of Medication Compliance

Variables	Experiment (n=75)	Control (n=75)	χ^2	p-value
Compliance (%)	56 (74.7%)	38 (50.7%)	8.23	0.004

Source: 2025 Data Processing Results

Chi-square analysis showed a significant difference in medication adherence between the two groups ($p = 0.004$). Elderly individuals who participated in the health education program demonstrated greater adherence to medication compared to those who did not participate in the intervention. These findings strengthen the evidence that health education not only improves knowledge and skills, but also impacts actual health behaviors.

Effectiveness of Health Education Programs

The results of the study showed that the health education program significantly improved self-management skills in elderly people with COPD. The average score increase of 14.66 points in the experimental group indicates that the educational intervention not only increased knowledge but also impacted behavioral changes and disease management skills (Habibie et al., 2022).

This finding aligns with Ramadhani's (2022) research, which found that dyspnea management-based education can improve self-efficacy in COPD patients. Similarly, Kim et al.'s (2022) research, which used the Information-Motivation-Behavioral Skills (IMB) model, found that education plays a crucial role in strengthening the motivation and self-management skills of COPD patients.

Increasing Self-Efficacy and Motivation in the Elderly

A structured educational program allows participants to gain a deeper understanding of their health condition. An interactive educational approach (discussion, breathing technique exercises, and motivational reinforcement) has been shown to increase seniors' confidence in managing physical activity, controlling symptoms, and adhering to treatment (Romadhon et al., 2020).

These findings support Self-Determination Theory (SDT), which emphasizes the importance of autonomy and competence in health behavior change (Deci & Ryan, 2012). Older adults who feel more competent and socially supported will be more motivated to implement self-management behaviors.

The Role of Knowledge and Social Support

Improved self-management in the experimental group was also influenced by increased health literacy following the education program. Repeated and interactive education made it easier for older adults to understand how to use medications, manage activities, and avoid triggers for relapse (Novianti & Suparmi, 2022).

This is consistent with the findings of Li et al. (2023), which showed that

health literacy is positively associated with self-management practices in COPD patients. Furthermore, support from family and healthcare professionals is also a key factor in maintaining these positive behavioral changes.

Limitations of Conventional Programs

The control group experienced a small increase in self-management scores, likely due to the standard medical care routine without additional educational intervention. This strengthens the argument that structured health education is more effective than conventional, purely informative approaches (Sahra et al., 2025).

CONCLUSION

Based on the analysis and discussion, it can be concluded that the health education program has a significant impact on improving the self-management skills of elderly with Chronic Obstructive Pulmonary Disease (COPD). The paired t-test results showed a significant increase in the experimental group with an average difference of 14.66 points ($p < 0.001$) compared to the control group which only increased by 2.61 points ($p = 0.021$), which proves the effectiveness of educational interventions in strengthening the self-management skills of COPD patients. In addition, the independent t-test results produced a value of $t = 10.64$ with Cohen's $d = 1.738$, indicating that the educational program has a strong practical impact on improving the knowledge, attitudes, and self-management skills of elderly. Health education has been proven to improve the knowledge, motivation, and self-efficacy of elderly in managing their disease, where the behavior-based educational approach allows them to better understand their health conditions, apply breathing techniques, improve adherence to therapy, and control daily symptoms independently. Thus, a structured health education program can be an integral part of elderly health services, as this intervention not only impacts individual capacity building but also has the potential to reduce relapse rates, prolong the stable period, and improve the overall quality of life of COPD sufferers.

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