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THE IMPACT OF MULTICOMPONENT LIFESTYLE ON SELF-EFFICACY IN STABLE CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS

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ABSTRACT
Chronic Obstructive Pulmonary Disease (COPD) is a global issue that continues to persist today. This is due to the increasing incidence and mortality rates of COPD worldwide from year to year. The aim of this study is to determine the effect of multicomponent lifestyle education on the self-efficacy of stable Chronic Obstructive Pulmonary Disease (COPD) patients at Rasyidin Hospital in Padang. This study is a quasi-experimental research with a control group design. The population in this study consists of 111 stable COPD patients at the Pulmonary Outpatient Clinic of Rasyidin Hospital Padang, all of whom are receiving outpatient services. The sample size in this study was 66 respondents, divided into two groups of 33 individuals each: the intervention group and the control group. Data analysis was conducted using a paired t-test with a significance level of 0.05. In the intervention group, it was found that multicomponent lifestyle education had an effect on self-efficacy, with a p-value of 0.000.

Keywords: COPD; education; lifestyle; multicomponent; self-efficacy

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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) remains a pressing global health issue due to its increasing prevalence and mortality rates worldwide over the years(WHO, 2021). According to the *Global Status of Non-communicable Diseases* report by WHO in 2010, COPD ranked among the top four non-communicable diseases and is projected to become the third leading cause of death globally by 2030 (Soeroto & Suryadinata, 2019). In Indonesia, the prevalence of COPD reached 28.3% of the population in 2013 and increased to 34.7% in 2018. In West Sumatra, COPD prevalence ranks 23rd out of 34 provinces. Dr. Rasyidin General Hospital, a Type C hospital in Padang, serves as a referral center for 23 primary health centers in the city. The hospital reported 127 cases of COPD in 2021(Kementerian kesehatan RI, 2021).

According to the Indonesian Association of Hospitals and Pulmonary Clinics(ARSABAPI, 2021), COPD patients are expected to develop good self-efficacy by engaging in regular exercise, managing their emotions, and adhering to routine medical check-ups. Despite having specific management strategies, COPD continues to pose health challenges due to its increasing prevalence, driven by exposure to risk factors such as smoking, tobacco use, and both indoor and outdoor air pollution. In addition to reduced lung function, COPD patients often experience extra-pulmonary disturbances and symptoms such as breathlessness, loss of appetite, and limited physical activity. These factors hinder daily functioning, leading to dependence on others and significantly affecting their quality of life. Understanding the disease and strategies to prevent exacerbations is essential for COPD patients. COPD management encompasses acute exacerbation treatment and stable condition management. According to the *Global Initiative for Chronic Obstructive Lung Disease* (GOLD, 2017), the

goals for managing stable COPD include Alleviating symptoms, improving exercise tolerance, and enhancing quality of life. Preventing disease progression, managing exacerbations, and reducing mortality risks. While COPD remains incurable, patients require lifelong care and daily management. During stable periods, patient self-efficacy is crucial in halting disease progression, preventing exacerbations, and avoiding hospitalizations.

One effective strategy for managing stable COPD is education, which enhances self-care knowledge, forming the foundation for chronic disease self-efficacy. Self-efficacy refers to the skilled behaviors individuals use to manage their conditions. Research by Bucknall et al., (2012) showed that 42% of COPD patients failed to manage daily activities effectively, such as exercising regularly, quitting smoking, or attending monthly check-ups. Similarly reported that 57.1% of COPD patients exhibited poor self-efficacy behaviors, including inadequate nutrition and sleep quality management. Home-care research found that poor self-efficacy in COPD patients often results from increased physical symptoms, emotional distress, and an inability to cope with stress (Cravo et al., 2022). These challenges hinder patients from performing daily activities and adapting to their condition. Thus, proper education and strong self-efficacy are critical for long-term COPD management.

One primary approach to improving self-efficacy in patients with Chronic Obstructive Pulmonary Disease (COPD) is through education. Currently, multicomponent lifestyle education is being introduced, which involves integrating several lifestyle components recommended for managing chronic diseases. This approach is also considered a behavioral intervention to modify and improve dietary habits and physical activity (Elvsaas et al., 2017; Siadat et al., 2013). Multicomponent education was first developed by Rybarczyk, DeMarco, DeLaCruz, Lapidos, and Fortner. Initially, it was utilized as an intervention to address psychological issues in the elderly by combining several components. Its application in managing various chronic illnesses has demonstrated significant positive effects on health outcomes (Rybarczyk et al., 2001). This program has shown remarkable effectiveness in reducing body mass index (BMI) in obese and overweight children by targeting unhealthy eating habits and physical inactivity . Its advantage lies in its ability to induce complex behavioral changes across multiple bodily functions. For instance, studies reveal that multicomponent education improves self-efficacy in asthma patients by up to 47% (Shames et al., 2004). Similarly, in diabetes management, this education positively impacts metabolic control parameters such as HbA1c, BMI, and blood pressure(Pinto et al., 2017; Elvsaas et al., 2017).

Interventions in patients with Type II Diabetes Mellitus (DM) have also demonstrated improvements in weight management, glycemic control, depression symptoms, and kidney function. These interventions yield better cardiometabolic risk factors and promote behavioral modifications that reduce long-term risks (Moncrieft et al., 2016). The implementation of multicomponent lifestyle education relies on a cognitive-behavioral approach tailored to the patient's needs, making it highly effective for fostering self-efficacy in chronic disease patients. Additionally, group-based interventions offer unique advantages for addressing the challenges faced by these patients(Taube-Schiff et al., 2007). Eight domains comprise multicomponent lifestyle education: psychoeducation, relaxation, self-monitoring, cognitive strategies, effective communication, problem-solving, nutrition, and physical activity. Researchers in lifestyle approaches often classify individuals based on activity, interests, and opinions(Moncrieft et al., 2016). Factors influencing lifestyle behaviors include modifiable components such as personal nutrition patterns, physical activity, sleep quality, cognition, motivation, and family support (Kapszewicz et al., 2022).

In this study, five domains of multicomponent lifestyle education were provided to stable COPD patients, aligned with *GOLD* (2017) guidelines Understanding COPD, Activity and Rest Management, Nutritional Management, Stress Management, Relaxation Techniques and Inhaler Usage, Self-Efficacy Theory in Nursing and Chronic Disease Management. Self-efficacy theory in nursing explores behavioral intention formation and aligns with the *Theory of Self-Management in Chronic Illness* by Lorig and Holman. According to this theory, self-efficacy is a dynamic and interactive process wherein individuals engage in managing their chronic conditions (Lorig & Holman, 2003). This theory includes three models: Medical Model Focuses on clinical aspects of disease management. Independence Model Encourages autonomy in patient care. Collaborative Model Promotes shared decision-making between patients and healthcare providers. In this study, multicomponent lifestyle education was delivered by applying all three models to empower COPD patients in self-managing their condition effectively.

Based on the theory explained and data obtained from medical records in a preliminary study at Rasyidin Hospital, it was found that 70 people were diagnosed with COPD. This number has increased from the beginning of 2022 to the present, with 127 COPD patients. An interview with the head of the outpatient clinic revealed that COPD patients are seen six times a week, from Monday to Saturday, with a total of 24 visits per month. The researcher also conducted interviews with 7 stable COPD patients at the Pulmonary Outpatient Clinic of Rasyidin Hospital in Padang City. Five patients reported experiencing shortness of breath during activities, which prevented them from engaging in activities such as exercise or walking. These patients also expressed that they were unaware of which foods should or should not be consumed. They only took the pharmacological therapy prescribed by their doctor and followed the recommended follow-up schedule. Meanwhile, two patients reported occasional shortness of breath but sometimes engaged in light activities, such as walking in front of their homes and doing breathing exercises.

In the pulmonary outpatient clinic at Rasyidin Hospital, there is no dedicated room for patient education due to space limitations. Education is typically conducted personally with the patient after consultations with the doctor. An interview with a pulmonary clinic nurse also revealed that patients come for follow-up visits twice a week and once a month. Education is provided by nurses using a discussion method, but demonstrations and direct observations of patients are not performed. Based on the preliminary study results, it is evident that COPD patients experience physical complaints due to inactivity, poor diet control, insufficient rest, and a lack of knowledge about managing shortness of breath, particularly related to unhealthy lifestyles. To address these complaints, providing education and counseling to patients is crucial. Given this issue, the researcher aims to investigate the impact of multicomponent lifestyle education on self-efficacy in stable COPD patients. The goal of this study is to determine the effect of multicomponent lifestyle education on self-efficacy in stable COPD patients at Rasyidin Hospital, Padang, in 2023.

METHOD

This study was a quasi-experimental study with a control group design aimed at determining the effect of multicomponent lifestyle education on the self-efficacy of patients with stable COPD. Self-efficacy aspects were measured before and after the intervention using a self-management questionnaire in the self-efficacy domain, which had been validated and tested for reliability with a Cronbach's Alpha value of 0.982. The population in this study consisted of 111 stable COPD patients receiving outpatient care at the Pulmonary Clinic of Rasyidin General Hospital in Padang. The sample size was 66 respondents, equally divided into two

groups: 33 respondents in the intervention group and 33 in the control group. Data analysis was performed using a paired t-test with a significance level of 0.05.

RESULT

Characteristics of Respondents

The distribution of respondent characteristics based on age, gender, occupation, educational background, and duration of COPD, along with the homogeneity test of respondent characteristics, is presented in the table below:

Table 1.
Frequency Distribution of Respondent Characteristics

Variable	Intervention		Control	
	f	%	f	%
Sex				
Male	20	60,6	23	69,7
Female	13	59,4	10	30,3
Occupation				
Civil Servant	9	27,3	10	30,3
Self-Employed	19	57,6	12	36,4
Unemployed	5	15,2	11	33,3
Duration Of COPD				
1-5 Year	32	97,0	31	93,9
6-10 Year	1	3,0	2	6,1

Based on the characteristics of respondents in the intervention group as presented in Table 1, it was found that the majority (60.6%) were male, most (57.6%) were self-employed, and nearly all (97.0%) had been diagnosed with COPD for ≤ 5 years. In the control group, as shown in Table 1, the majority (69.7%) were male, a smaller proportion (36.4%) were self-employed, and nearly all (93.9%) had been diagnosed with COPD for ≤ 5 years.

Effect of Lifestyle Education on Self-Efficacy in COPD Patients

The results of the paired-sample t-test to determine the effect of multicomponent lifestyle education on the self-efficacy of respondents in the intervention group are presented in the following table:

Table 2.
The Effect of Multicomponent Lifestyle Education on COPD Patients in the Intervention Group (n=33)

Self-eficacy	Mean	SD	95% CI	P Value
Pre Test	27,66	2.16	-7,76 -6,23	0,000
Post Test	34,66			

Based on Table 2, it was observed that in the intervention group, multicomponent lifestyle education had a significant impact on self-efficacy, with a mean difference of 7.00 and a p-value of 0.000.

DISCUSSION

The results of the study show that in the intervention group, based on the self-efficacy domain, the average score before the intervention was 27.66 ± 3.47, and after the intervention, it increased to 34.66 ± 2.56. The total symptom management score ranged from 9 to 45. This is in line with a study by Wang, which found that the average self-efficacy score for COPD patients was 28.94 ± 6.10 (T. Zhang et al., 2020). When categorized, 51.5% of the respondents in the intervention group and 57.6% of the respondents in the control group had poor self-efficacy. Based on the questionnaire analysis, 30.3% of respondents in both the intervention and control groups never changed their mood (e.g., anxiety, depression) through exercise.

Self-efficacy is an important aspect of chronic disease management, including for patients with Chronic Obstructive Pulmonary Disease (COPD). Good self-efficacy can help patients manage symptoms, improve quality of life, and minimize the risk of complications. In this context, a multicomponent lifestyle is one approach that has been proven effective in improving self-efficacy in COPD patients. The study results show that multicomponent lifestyle education has a significant impact on improving self-efficacy. Interventions that include education on physical activity, nutrition, stress management, and adherence to therapy have proven to have a positive effect. In the intervention group, the improvement in self-efficacy indicates that the intervention was statistically effective in enhancing patients' confidence in managing their condition (Aminuddin et al., 2021; Feng et al., 2024).

The impact of multicomponent lifestyle interventions on the self-efficacy of patients with Chronic Obstructive Pulmonary Disease (COPD) has been shown to be significant, as evidenced by various studies. These interventions, often including physical training, behavioral change strategies, and digital health tools, aim to enhance self-management and empower patients to take control of their health. Programs based on empowerment theory have been proven to improve self-efficacy and adherence to rehabilitation in COPD patients, leading to better clinical outcomes(Zhang et al., 2024).

The Digital Metabolic Rehabilitation Program integrates lifestyle changes through a web-based platform, promoting self-monitoring and self-management practices. Multicomponent physical training, including aerobic, strength, balance, and flexibility exercises, has been found effective in improving physical-functional performance and self-efficacy in COPD patients (Silva et al., 2024;Mazzarin et al., 2023). The application of behavior change theories has led to significant improvements in physical activity levels, self-efficacy, and health-related quality of life among COPD patients (Xiang et al., 2023).

Self-efficacy refers to an individual's belief in their ability to independently understand and manage chronic diseases. It plays a crucial role in influencing treatment adherence and disease knowledge, particularly in chronic conditions such as Chronic Obstructive Pulmonary Disease (COPD) (Yang et al., 2019).. The level of self-efficacy determines a person's ability to perceive, think, motivate, and behave appropriately in managing treatment (Wang et al., 2017). Improvements in self-efficacy can occur through multicomponent lifestyle education, which not only provides knowledge but also equips patients with practical skills to address daily challenges. For example, training in breathing techniques, safe physical activity management, and dietary planning tailored to COPD conditions helps patients feel more capable of controlling their health (Dębczyński et al., 2021; Murphy et al., 2017).

These findings align with Bandura's self-efficacy theory, which posits that an individual's belief in their capabilities is influenced by experiences of success, role models, verbal encouragement, and emotional regulation. In multicomponent lifestyle interventions, patients experience success through guided exercises, real-life examples from healthcare professionals or peers, verbal reinforcement from educators, and strategies for managing stress (Bandura, 1986). In clinical practice, multicomponent lifestyle interventions can become a part of COPD rehabilitation programs. Healthcare professionals can design interventions tailored to individual needs, considering the severity of the disease, age, and patient preferences. Additionally, these programs can involve family members or caregivers to create a more supportive environment. Self-efficacy encompasses behaviors that prevent disease progression, monitor symptoms, and improve quality of life. Good self-management behaviors, over time, foster a healthy lifestyle, promote adaptive behaviors, alleviate discomfort, and even enhance immune function (Haslbeck et al., 2015). Interventions focused

on self-efficacy help COPD patients acquire disease management knowledge and skills while fostering a positive attitude toward their condition. This approach has been widely endorsed by medical communities both domestically and internationally (Kapszewicz et al., 2022).

In the control group, the self-efficacy domain showed an average pre-intervention score of 26.21 ± 4.19, which decreased to 24.87 ± 4.43 post-intervention. Low self-efficacy is reflected in a lack of confidence, reluctance to engage in proper exercise, and poor treatment adherence, often due to the characteristics of COPD (slow progression, long disease course, and incurability) and issues such as breathing difficulties. The self-efficacy status of COPD patients is influenced by various factors, including general social factors, disease status, and psychological conditions. Research has revealed a negative correlation between COPD patient age, lifestyle, physical function decline, weakened tolerance, and reduced comprehension ability(Chalfont et al., 2021).

CONCLUSION

Based on the research findings and discussion on the impact of multicomponent lifestyle education on the self-efficacy of patients with stable Chronic Obstructive Pulmonary Disease (COPD), it can be concluded that multicomponent lifestyle education significantly improves self-efficacy in the intervention group. This is evidenced by a mean difference of 7.00 and a p-value of 0.000 ($p < 0.05$), indicating statistical significance. Thus, multicomponent lifestyle education has been proven to be an effective method for enhancing self-efficacy.

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