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The Effect of Providing Education Through Video on the Level of Knowledge of Inhaler Use in Asthma Patients

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Abstract: Asthma is a heterogeneous lung disease that affects more than 300 million people. The most ideal dosage form for asthma therapy is via the inhalation route, namely with a device called an inhaler. This study aims to see the effect of providing education via video to outpatient asthma patients at the Praya Regional Hospital, Central Lombok, NTB Province. The Wilcoxon test was carried out to determine the significance of changes in knowledge and attitudes about asthma prevention before and after treatment at the 95% confidence level (α=0.05). From the research results, it is known that 61.54% of the 13 respondents from asthma outpatients at Praya Regional Hospital were men, and 38.46% were women and were dominated by people aged >45 years. Patients admitted that their asthma complaints were caused by a history of allergies, as many as 61.54% were allergic to dust, followed by allergies to cold and food (seafood). The number of samples was limited so a chi-square test was carried out which then found a relationship between two variables, namely gender and length of inhaler use with the knowledge score on how to use the inhaler correctly which was marked with a significance value. <0.05.

Keywords: Asthma; Video; Education; Knowledge; Inhalers

Introduction

Asthma is a heterogeneous lung disease that affects more than 300 million people worldwide (Hsieh et al., 2023; Maggi et al., 2022). Asthma symptoms are shortness of breath, wheezing and coughing (Mortimer et al., 2022; Reddel et al., 2022). Asthma affected up to 262 million people worldwide in 2019 according to the Global Burden of Disease Collaboration. Globally, asthma is the 24th leading cause of *disability-adjusted life years (DALYs)* and the 34th leading cause of disease burden (Reddel et al., 2022). According to *the Global Initiative for Asthma (GINA) 2020*, the global prevalence of asthma is 1-18% which continues to increase every year.

Based on data from Basic Health Research in 2018, the prevalence of asthma in Indonesia in the population of all ages reached 2.4% with an estimated number of asthma patients of 1,017,290 people and NTB accounted for 3.14% of the total 21,308 people based on doctor's diagnosis at all ages. Especially in Central Lombok Regency, it reached 8,992 cases and included 3 out of 10 of the most diseases (Central Lombok Health Office, 2014).

Well-controlled asthma is the goal of long-term asthma management. The frequency of asthma recurrence is one of the indicators of asthma control (Chung et al., 2022). The reason why asthma patients do not receive regular treatment which also results in poor asthma recurrence control is that 9.8% of respondents cannot tolerate the side effects of drugs, 9.8% of examination costs and drugs are expensive, 8.82% feel that there is no improvement after treatment and 14.71% feel that the place of treatment is too far (Longo et al., 2021, 2022; Papadopoulos et al., 2021). Asthma recurrence can be influenced by a lack of knowledge about asthma recurrence prevention efforts so that severe acute attacks are kept to the maximum and can minimize complications (Ernawati, 2022; O'Donnell et al., 2023; Zenone et al., 2021). Medication for asthma can be done in various ways, namely parenterally, orally or inhaled. The most ideal form of preparation for asthma therapy is through the inhalation route, which is with an instrument called an inhaler (Ming et al., 2023; Saragih &

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Andayani, 2022). The advantage of inhalation therapy is that the drug is delivered directly into the respiratory tract and directly into the lungs, resulting in higher local concentrations and having a lower risk of systemic side effects. Choosing the right inhaler device can be the first step towards optimal treatment. Inhalation therapy in asthma patients can be given using *a nebulizer, Dry Powder Inhaler (DPI), and Metered Dose Inhaler (MDI)* (Jaun et al., 2023; Makki et al., 2024)

MDI is an inhaler that has been used for a long time, but it often causes problems due to the lack of coordination between the suppression of the canister and the inspiration of the breath, so many drugs are deposited in the mouth and can cause oropharyngeal candidiasis (Sorino et al., 2020). A study conducted by (Sivaramakrishnan et al., 2023) on 203 asthma patients, showed that as many as 189 patients (93%) used MDI inappropriately. Meanwhile, another study conducted by (Abougalambou et al., 2022) on 300 patients, showed that 94% made mistakes in using MDI. The impact that occurs from miscoordination in the use of MDI is that it can cause drugs that reach the lungs to be suboptimal, resulting in therapy failure in patients which then causes low productivity and health care costs to be more expensive (Fadhilah et al., 2020).

This research uses video media because there are audio and visual elements, which involve hearing and sight at the same time in one process or activity. Messages and information that can be channeled through this media can be in the form of verbal and nonverbal messages that rely on sight and hearing. The advantage of education using video is that it is faster and more effective in conveying messages than text media and is able to clearly show the procedure of a step (Sovia, 2024). The audio contains instructions explaining the correct use of inhalers and visuals containing the steps of the correct use of inhalers.

Praya Hospital was chosen by the author based on data on the highest number of average outpatient visitors per day from other health facilities in the Central Lombok region, which was 29/day or 10,603 in 2021 and 10,479 in 2023. Based on the data on the most outpatient diseases of Praya Asthma Hospital occupying the second rank of the most diseases after dyspnea, it is important to manage the risk of asthma recurrence in the Central Lombok area.

Method

The research design used in this study uses a *pretest-posttest group design (pretest posttest with control group design).* One group pretest posttest is a technique to determine the effects before and after treatment (Asti & Ayuningtyas, 2020)

Table 1. Pretest and Postest

	Pretest	Treatment	Postest
Experiment	O1A	x	O2A
Control	OIB	-	O2B

Information:

X : Intervention in the form of providing education through videos on how to use the appropriate inhaler

O1A : Level of knowledge prior to the educational intervention through videos on how to use the appropriate inhaler

O2A : Level of knowledge after video education on how to use the right inhaler

O1B : Level of knowledge through videos on how to use the proper inhaler

O2B : Level of knowledge through videos on how to use the proper inhaler

Population and Sample

Population is the entire object of research or object being studied (Willie, 2024) In this study, the population used was all outpatients with an asthma diagnosis at Praya Hospital during the period from January to December 2023, which amounted to 181 people. The population is a target group that is a source of data to answer the formulation of the problem and achieve the research objectives (Heikkilä, 2022; Shah, 2023). According to (Willie, 2024), samples are part of the number and characteristics possessed by the population. Sampling was carried out because researchers have limitations in terms of time, energy, funds, and a large enough population, so it is not possible to conduct research on the entire population. Therefore, the selection of a representative sample is important to obtain valid and generalizable results. In this study, researchers narrowed the population down to a sample taken from a total of 181 people using the Slovin calculation formula.

The Slovin formula is used to determine the exact sample size based on the number of populations and the tolerable error rate. This formula is particularly useful when the behavior of the entire population is unknown or too large to be studied directly (Lerner et al., 2025; Sarkar et al., 2024). By applying this formula, researchers can calculate an appropriate number of respondents needed for the study. Thus, the number of samples obtained is expected to be able to represent the characteristics of the population proportionally. This, in turn, supports the validity and generalizability of the research results(Ahmed, 2024).

$$\boldsymbol{n = \frac{N}{1 + Ne^2}}$$

Information:

n : Sample size/number of respondents
N : Population size
E :P percentage of leniency in the accuracy of sampling errors that can still be tolerated
e :0.1 In the Slovin formula there are the following conditions:
Value e : 0.1 (10%) for large populations
Value e : 0.2 (20%) for a small population.

So the range of samples that can be taken from the Solvin technique is between 10-20% of the research population. The number of population in this study is 181 respondents so that the percentage of leniency used is 10% and the calculation results can be rounded to achieve conformity. So to find out the research sample, with the following calculations:

$$\boldsymbol{n = \frac{181}{1 + 181.0,1^2}}$$

$$\boldsymbol{n = \frac{181}{2,81}}$$

$$\boldsymbol{n = 64,4 \approx 64 \text{ person}}$$

The sampling technique in this study is to use purposive sampling where the selection technique is based on certain criteria. The inclusion criteria for asthma patients aged 18-50 years and are able to operate gadgets. Exclusion criteria for patients with other respiratory comorbidities (COPD, bronchiettasis, critical bronchitis, cystic fibrosis). This research was conducted at Praya Hospital in April 2024.

The data was obtained directly to the respondents using a questionnaire and given to the respondents before and after being educated via video on the https://youtu.be/7t6a_aBONgg?si=xsL8_gAP4zFYpC8 link. Secondary data obtained by researchers indirectly from Praya Hospital includes data on outpatient asthma patients in January-December 2023. This study aims to test the significance of the influence of video education on the knowledge of how to use inhalers correctly. To test this hypothesis, a normality test was first carried out using the Kolmogorov Smirnov statistical test and the results of the data were not normally distributed, a Wilcoxon statistical test was obtained. Wilcoxon's analysis was to determine the significance of changes in knowledge and attitudes about asthma prevention before and after treatment at a 95% confidence level using statistical software. The level of significance α=0.05 with decision-making if Pα≤ 0.05 = H1 is accepted, means that there is an effect of education with video media on the knowledge of inhaler use in asthma patients at Praya Hospital.

Result and Discussion

This research was carried out in July 2024, the number of initial samples of patients who will be involved in this study is 64 people but only 13 people can be covered, this is due to limitations in the collection of patient medical record data, namely the lack of compliance of Praya Hospital health personnel in ensuring that the patient's medical record data has been filled in completely. In the literature (Hasmah et al., 2022), recording medical records is often considered a secondary problem by health care providers such as doctors, nurses and other health workers. Due to the busy level of doctors and nurses, often medical record files are not filled out completely and are not returned on time. As a result, medical record officers often feel hampered in the process of processing medical record files, not to mention that sometimes medical record officers also work concurrently as patient reception operators. So that it will increase the workload of medical record officers due to concurrently working other jobs besides processing medical record files.

Overview of Asthma Patient Characteristics

Each patient must have different characteristics. To find out the description of the characteristics of outpatient asthma patients who use inhalers, it can be seen from several factors, namely gender, age, occupation, education, and allergies experienced by the patient. The following is an overview of the characteristics of asthma patients at Praya Hospital in table 2. The respondents involved in this study were 13 outpatient asthma patients at Praya Hospital. Based on table 2, the number of male asthma patients is more than female. This is inversely proportional to the statistical data obtained by the National Center for Health Statistics (NCHS) which found that the incidence of asthma is more found in women (9.2%) compared to men (7.7%) (Chowdhury et al., 2021; Lugogo et al., 2022). Physical factors are a potential factor in the occurrence of non-specific bronchial hyperresponsiveness found more often in women than men and women are also known to have a smaller respiratory caliber compared to men (Lugogo et al., 2022). Increased estrogen has a role in every allergy sensitization process, namely allergen presentation, type 2 helper T cell polarization, IgE isotype and mast cell degranulation through estrogen receptors. These factors that trigger asthma in adult women are inevitable, thus increasing the prevalence of asthma in adult women. Based on the results of the

research that has been conducted, there are more asthma patients with an elderly age, namely at the age of > 45 years as much as 61.54%.

This is because the higher the patient's age, the more organ function in the patient decreases, so that the incidence of asthma is often experienced by patients with advanced age. Exposure to the work environment such as allergens, cigarette smoke and pollutants can affect individuals in causing asthma and even worsen the condition of individuals who have a history of asthma (Castillo Latorre et al., 2023; Chatkin et al., 2022; Nishida & Yatera, 2022) The highest percentage of education level is high school as much as 69.23%. The level of patient education will affect the accuracy of use. The higher the level of education, the less errors in the use of inhalers can be reduced and the frequency of asthma recurrences will also decrease. All outpatient asthma patients who were respondents in this study had been using inhalers < 5 years. Patients who use inhalers for longer will be more proficient in inhaler use because they use inhalers more often and are more accustomed to them.

Table 2. Characteristics of Respondents of Outpatient Asthma Patients at Praya Hospital

Characteristic	Category	Number of Patients	%
Gender	Man	8	61,54
	Woman	5	38,46
Age	18-25 Years	2	15,38
	25-32 Years	3	23,08
	32-44 Years	-	0,0
	>45 Years	8	61,54
	SD	1	7,69
Education History	Junior	-	0,0
	SMA	9	69,23
	S1/S2	3	23,08
Inhaler Usage Length	<5 Years	13	100
	>5 Years	-	0,0
History of allergies	Dust	8	61,54
	Cold	4	30,77
	Animal fur	-	0,0
	Smoke	-	0,0
	Miscellaneous	1	7,69

The length of use of the inhaler can be related to the severity of the patient's asthma, because if the patient has been using the inhaler for a long time, it may be because the asthma he suffers from is severe enough that the patient must use the inhaler continuously to control asthma. Each patient has different factors that cause asthma, most asthma patients at Praya Hospital admitted that the asthma they suffered was accompanied by allergies, namely as many as 8 people admitted to being allergic to dust, 4 others were allergic to cold and 1 person had allergies caused by food (seafood). Each allergy suffered by the patient is a trigger for asthma in the patient, so the frequency of asthma attacks for each patient is different depending on the allergy suffered, the more allergies suffered, the greater the frequency of asthma occurrence. Exposure to allergens in asthma patients causes the respiratory tract to react abnormally, triggering the release of inflammatory mediators, one of which is histamine. Abnormal reactions from the presence of allergens will increase responsiveness in smooth muscles so that bronchoconstriction occurs in the respiratory tract (Castillo Latorre et al., 2023; Henry et al., 2025)

Inhaler Use Accuracy Profile

Proper inhalation techniques play an important role in the management of asthma and can directly affect the quality of life of patients, especially in terms of the frequency of symptom recurrence. Patients who use inhalation techniques correctly tend to experience a significant decrease in the incidence of asthma symptoms and show an overall improvement in quality of life. This is reinforced by (Chrystyn et al., 2022)) research which states that the correct use of inhalation techniques contributes to better symptom control and improved patient well-being. Therefore, the role of health workers is urgently needed in providing education and guidance to patients on how to use inhalation preparations appropriately. Effective education can be done through various media that are easily accessible and understood by patients (Dhruve &

Jackson, 2022; Halpin & Mahler, 2022; Melani, 2021). This video is designed to be re-watched so that the patient has the opportunity to understand and practice the inhalation technique correctly according to the instructions provided.

Table 3. Inhaler Use Accuracy Assessment Profile

Vulnerable Value	Allergy	Final Education	Total Score
25-32 Years	Dust	S1/S2	20
> 42 years	Dust	SMA	26
18-25 Years	Dust	S1/S2	18
18-25 Years	Cold	S1/S2	18
> 42 years	Dust	SAM	12
> 42 years	Cold	SD	23
> 42 years	Cold	SMA	22
> 42 years	Dust	SMA	21
25-32 Years	Cold	SMA	23
25-32 Years	Seafood	SMA	21
> 42 years	Dust	SMA	21
> 42 years	Dust	SMA	14
> 42 years	Dust	SMA	11
Average			**18,2 (18)**

Table 3 illustrates the total score of patients who have answered the questionnaire, the higher the total score obtained, which means that the patient concerned has a good understanding of the video education provided. The use of inhalers is said to be appropriate if there is not a single step that is passed by the patient and is done in order, the highest score that the patient can get is 28, in this case the almost perfect score is obtained by the patient at number 2 with the age of > 42 years. And the lowest score is worth 11. The average score of 13 patients was 18.2 or 18 points.

Data Analysis on the Relationship of Patient Characteristics with Knowledge of the Right Inhaler Use

Based on the results of the above analysis, it is known that the value of Asymp. The sig. (2-sided) on the Pearson Chi-Square test was 0.296, which is greater than the significance value of 0.05. This suggests that there is no significant relationship between age and total scores. Thus, statistically, age did not affect the level of understanding or performance of respondents to the instruments or education provided in this study. However, researchers assume that theoretically, increasing a person's age can affect the level of understanding of an education, due to the factors of maturity, experience, and maturity of thinking. The results of this study are not in line with the statement of (Darmawan & Tjalla, 2021) who stated that the older a person is, the better the level of maturity and strength in thinking. Therefore, there is a possibility that there are other variables that mediate or moderate the relationship between age and total scores, such as education level, previous experience, or health condition.

Some evidence supports that old age may be a factor in understanding or using certain therapeutic tools. For example, misuse of MDI inhalation therapy devices is very common in elderly patients with asthma (Abougalambou et al., 2022; Sivaramakrishnan et al., 2023). In clinical practice, it is essential for healthcare providers, particularly doctors, to assess the patient's ability to correctly use inhalation devices (GÖRGÜLÜ et al., 2021). Proper inhaler technique plays a vital role in ensuring the effectiveness of asthma treatment, and

incorrect usage can lead to suboptimal therapeutic outcomes. Therefore, evaluating the patient's inhalation technique should be a routine part of asthma management, especially for those who are newly diagnosed or have poor symptom control. Although some elderly patients with advanced asthma may benefit from the use of metered-dose inhalers (MDIs) equipped with spacers, many still experience challenges in properly connecting or operating the device (de Boer & Thalberg, 2021; Kumar et al., 2022). These difficulties are often due to age-related physical or cognitive limitations, such as reduced hand strength, visual impairment, or memory issues. This highlights the importance of implementing a more tailored and adaptive educational approach that accommodates the specific needs of older adults, ensuring they can use their inhalers effectively and safely.

Table 4. The Relationship of Age with Knowledge of the Right Inhaler Use

			Total Score			
			Good	Bad	Total	P
Age	18-25 Years	Count	0	2	2	0,296
		% of Total	0,0%	15,4%	15,4%	
	25-32 Years	Count	0	3	3	
		% of Total	0,0%	23,1%	23,1%	
	> 42 years old	Count	3	5	8	
		% of Total	23,1%	38,5%	61,5%	
Total		Count	3	10	13	
		% of Total	23,1%	76,9%	100,0%	

Based on the results of the analysis in table 5, the Asymp value is known. The sig. (2-sided) on the Pearson Chi-Square test was 0.035 < 0.05, so it can be concluded that there is a significant relationship between sex and total score. This study is not in line with the results of Khaidir's 2019 research where severe asthma sufferers are higher in women than in men. Gender is one of the things that is a risk factor where in the criteria young men are more susceptible to asthma than in the female group, but in the adult age group the risk of developing asthma is the same and at the age of 40 years asthma in women is higher. This is because the size of the respiratory tract in young men is smaller and inversely proportional at the age of >40 years.

Table 5. Sex Relationship with Knowledge of the Right Inhaler Use

			Total Score			
			Good	Bad	Total	P
Gender	Man	Count	0	8	8	0,035
		% of Total	0,0%	61,5%	61,5%	
	Woman	Count	3	2	5	
		% of Total	23,1%	15,4%	38,5%	
Total	> 42 years old	Count	3	10	13	
		% of Total	23,1%	76,9%	100,0%	

Based on the results of table 6 analysis, the Asymp value is known. The sig. (2-sided) on the Pearson Chi-Square test was 0.420 > 0.05, so it can be concluded that there is no relationship between the last education and the total score. In this case, the results of the research that have been carried out are different from the theory put forward by Irwanto, 2010. Education affects a person's attitudes, actions, and thoughts, where everyone who usually has primary, secondary or higher education, each has different characteristics. This is because education will affect the mindset, the higher the education, the better the thinking and behavior. The mindset resulting from the knowledge gained from education will have an impact on actions, attitudes, actions, in addition to other influencing factors such as the environment. This shows that people with higher education tend to be more concerned about personal health, so efforts to improve their health are taken by

going to health facilities. The right way to use inhalation therapy depends on the type of therapy used by the patient, so patients must know and understand the right stages in using the inhalation therapy tool used. In fact, sometimes patients can demonstrate how to use inhalation therapy devices correctly when consulting a health professional, but patients do not maintain these standards of use every time.

Table 6. The Relationship of Education with Knowledge of the Right Way to Use Inhalers

			Total Score			
			Good	Bad	Total	P
Final education	SD	Count	0	1	2	0,420
		% of Total	0,0%	7,7%	15,4%	
	SMA	Count	3	6	3	
		% of Total	23,1%	46,2%	23,1%	
	S1/S2	Count	0	3	8	
		% of Total	0,0%	23,1%	61,5%	
Total		Count	3	3	10	
		% of Total	23,1%	76,9%	100,0%	

Based on the results of the analysis in Table 7, the Asymp. Sig. (2-sided) value in the Pearson Chi-Square test was 0.000, which is less than the significance level of 0.05. This indicates that there is a statistically significant relationship between the duration of inhaler use and the total score. In other words, the longer a patient has used an inhaler, the better their understanding or ability in relation to its proper use, as reflected in the higher total scores. For individuals with asthma, the use of inhalers plays a crucial role in managing the condition. Since asthma is a chronic disease that cannot be cured, it requires consistent control through the avoidance of triggers and the timely use of inhalers, especially during an asthma attack. Therefore, asthma patients are strongly encouraged to carry an inhaler at all times to ensure immediate relief when symptoms occur, emphasizing the importance of proper inhaler use and patient education.

Table 7. The Long-Standing Relationship of Inhaler Use with Knowledge of the Right Inhaler Use

			Total Score			
			Good	Bad	Total	P
Inhaler Usage Length	< 5 years	Count	0	10	10	0,000
		% of Total	0,0%	76,9%	76,9%	
	> 5 years	Count	3	0	3	
		% of Total	23,1%	0,0%	23,1%	
Total	> 42 years old	Count	3	10	13	
		% of Total	23,1%	76,9%	100,0%	

Based on the results of the analysis in table 8, it is known that the value of Asymp. The sig. (2-sided) on the Pearson Chi-Square test was 0.296, which is greater than the significance level of 0.05. Thus, it can be concluded that there is no significant relationship between allergy history and total score. This means that the presence or absence of a history of allergies in respondents does not directly affect the score results obtained in this study. These findings indicate that a history of allergies is not a dominant factor influencing respondents' understanding or ability in the context measured by total scores. In fact, theoretically, a person with a history of allergies—especially those related to respiratory disorders such as asthma—may be related to the use of certain therapies or education. However, in this study, no significant score differences were found between respondents with and without a history of allergies, suggesting that other variables may have a greater influence, such as education level, access to information, or personal experience in the use of therapy. Thus, it is important for healthcare professionals and educational program planners to not only consider clinical factors such as a history of allergies, but also pay attention to other aspects that can affect the patient's understanding

and skills. Education that is comprehensive and adaptive to social backgrounds and individual abilities will be more effective in improving intervention outcomes. These results also confirm the importance of a holistic approach in designing health interventions, so that they are not limited to one specific medical aspect (Rane, 2025; Strielkowski et al., 2025).

Table 8. The Relationship of Allergy History to Knowledge of the Right Inhaler Use

			Total Score			
			Good	Bad	Total	P
History of allergies	Dust	Count	3	5	2	0,296
		% of Total	23,1%	38,5%	15,4%	
	Cold	Count	0	4	3	
		% of Total	0,0%	30,8%	23,1%	
	Seafood	Count	0	1	8	
		% of Total	0,0%	7,7%	61,5%	
Total		Count	3	3	10	
		% of Total	23,1%	23,1%	76,9%	

Conclusion

From the results of this study, it is known that a total of 13 asthma patients at Praya Hospital are 61.54% men, and 38.46% women and are dominated by people aged > 45 years. Patients admitted that the asthma complaints suffered were due to a history of allergies, as many as 61.54% were dust allergies followed by cold and food allergies (seafood). Based on the chi-square test that has been carried out, it was found that there was a relationship between two variables, namely gender and length of inhaler use with a score of knowledge of how to use the right inhaler which was marked by a significance value of < 0.05. More complete data collection is needed to determine the factors that affect the accuracy of inhaler use and the level of satisfaction with inhalation therapy in asthma patients. It is necessary to analyze the satisfaction of inhalation therapy using instruments or questionnaires about the level of satisfaction of other inhalation therapy.

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The authors declare no conflict of interest.

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