

Original research article

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The Education of Family Medicine Services Using Artificial Intelligence Video Method for Hypertension Prolanis Patients at Simpang Kawat Health Center

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ABSTRACT

Background: Hypertension management requires effective strategies, with family medicine often playing a neglected role. **Objective:** This study examines the efficacy of AI-based videos in improving knowledge among Prolanis hypertension patients at Simpang Kawat Health Center. **Methods:** This quasi-experimental study employed a pre-test post-test control group design. The experimental group (43 Prolanis hypertension patients from Simpang Kawat Health Center) received AI video education, while the control group (39 patients from Talang Bakung Health Center) received traditional slide-based education. Participants were selected via purposive sampling. **Results:** The majority of patients at Simpang Kawat Health Center were adults (55.8%), female (86%), and had primary education (44.2%). In contrast, most patients at Talang Bakung Health Center were elderly (76.9%), female (100%), and had primary education (74.4%). The knowledge level of hypertensive Prolanis patients at Simpang Kawat Health Center significantly improved after receiving AI-based video education, with the percentage of patients with low knowledge dropping from 88.4% to 41.9%. Similarly, at Talang Bakung Health Center, the standard education method improved, with the percentage of patients with low knowledge reducing from 87.2% to 60.5%. **Conclusion:** AI-based educational videos enhanced patient knowledge more effectively than traditional methods.

Keywords: Family medicine; Prolanis hypertension; AI Video

INTRODUCTION

Healthcare is one of the efforts to create a healthy environment. Healthcare

services consist of medical services and public health services. Family medicine services are an example of medical

services that primarily target family patients.¹

The establishment of KSDK (Kelompok Studi Dokter Keluarga) in 1980 by experts from various medical disciplines indicates that the development of medical science will move towards a sectoral approach, meaning that a specialized approach is necessary to ensure that the sectoral advancements in various specialized fields do not disrupt patient care.² Family medicine services are crucial in national healthcare as they provide integrated, comprehensive, continuous, and sustainable healthcare, which is expected to achieve the primary goal of national health: to improve overall health status.¹

Currently, family medicine services are not widely recognized by the public. According to Nafsiah Zahidah's 2022 study on patients at community health centers in Jambi City, only 5.6% of respondents had a regular family doctor, and 72.5% had limited family medicine knowledge.³ Similarly, a 2023 study by Faisal Afghan on patients at independent medical practices in Jambi City found that 83.9% of respondents lacked knowledge about family medicine, and only 10.7% of the 112 respondents had a family doctor.⁴

In this study, hypertensive Prolanis patients were chosen as the sample because, according to data from the Jambi City Health Office in 2022, hypertension ranked the highest non-communicable disease in Jambi City, with 7,032 reported

cases.⁵ The high prevalence of hypertension, particularly uncontrolled hypertension, increases the risk of cardiovascular-related diseases such as myocardial infarction, stroke, and acute kidney failure.⁶⁻⁸ According to Armaid Darmawan (2016), hypertension is a risk factor for chronic and degenerative non-communicable diseases, which have now surpassed infectious diseases as leading causes of death. A healthy lifestyle, along with family and community support, is essential to modify behaviors in hypertension management to address this issue.⁹⁻¹¹

According to Anggiya Yuliasari (2018), the family medicine approach in diagnosis and treatment facilitates hypertension management. This ease in managing hypertension is attributed to the unique characteristics of family medicine services.¹² The principles of family medicine need to be integrated into the PROLANIS Program to provide a better understanding for individuals and families affected by chronic diseases, enabling the implementation of more effective management practices.¹³

Health education about family medicine services is essential to provide patients with knowledge about the benefits of such services, enabling them to actively contribute to achieving optimal health, encompassing physical, mental, and social well-being.¹⁴ Various media are available for health education, including video content created using artificial intelligence

(AI).¹⁵ Health education through video has been increasingly developed in line with technological advancements. Video-based education is a type of audiovisual media that engages both hearing and vision, making it easier for individuals to comprehend information by providing effective visualizations.¹⁶

AI educational videos are videos created with the assistance of artificial intelligence, providing concise, clear, and comprehensive information or messages. About family medicine knowledge.¹⁷ AI refers to processes where computers and machines simulate human behavior, including perception, learning, reasoning, analysis, and decision-making, to perform tasks through data processing and pattern recognition.¹⁸ It is crucial for healthcare services to understand the state of AI technology and how it can be leveraged to enhance efficiency, improve access to healthcare, and achieve value-based care.¹⁹

Based on this background, the researcher is interested in examining the impact of AI-based health education videos on the knowledge of family medicine services among Prolanis hypertension patients at Simpang Kawat Health Center. Meanwhile, the control group in this study employs the standard method, using slide presentations for Prolanis hypertension patients at the Talang Bakung Health Center.

METHODS

This study used a quantitative design with a quasi-experimental approach and a pre-test-post-test control group design. The study population consisted of hypertension Prolanis patients at Puskesmas Simpang Kawat (experimental group) and Puskesmas Talang Bakung (control group). The sample was selected using purposive sampling, involving 43 participants in the experimental group and 39 in the control group. The inclusion criteria included patients registered in Prolanis who were willing to participate in the study, while the exclusion criteria were patients who did not complete the education session, were in poor mental condition, or were severely ill. The instruments included AI videos ([Video AI](#)), slides ([Slides](#)), and a validated family medicine service knowledge questionnaire. Data were analyzed using a paired t-test and an independent t-test.

RESULTS

Tables 1 and 2 present the demographics of Prolanis hypertension patients at Simpang Kawat Health Center and Talang Bakung Health Center who met the inclusion criteria, categorized by age, gender, and education. Among the 43 Prolanis hypertension patients at Simpang Kawat Health Center, the largest percentage was adults, accounting for 55.8% of respondents, with 86% being female and 44.2% having a basic education level. Meanwhile, among the 39

Prolanis hypertension patients at Talang Bakung Health Center, the largest percentage was elderly, comprising 76.9%

of respondents, with 100% being female and 74.4% having a basic education level.

Table 1. Demographic Distribution of Prolanis Hypertension Patients at Simpang Kawat Health Center

Variable	Frequency (n)	Percentage (%)
Age		
Adult = 19-59 Years	24	55.8
Elderly = ≥ 60 Years	19	44.2
Gender		
Male	6	14
Female	37	86
Education		
Basic Education = ≤ Junior High School	19	44.2
Secondary Education = High School	18	41.9
Higher Education = University	6	14

Table 3 shows the level of knowledge about family medicine services among Prolanis hypertension patients at Simpang

Kawat and Talang Bakung Health Centers, assessed through the questionnaire results.

Table 2. Demographic Distribution of Prolanis Hypertension Patients at Talang Bakung Health Center

Variable	Frequency (n)	Percentage (%)
Age		
Adult = 19-59 Years	9	23.1
Elderly = ≥ 60 Years	30	76.9
Gender		
Male	0	0
Female	39	100
Education		
Basic Education = ≤ Junior High School	29	74.4
Secondary Education = High School	7	17.9
Higher Education = University	3	7.7

Before the intervention, most Prolanis hypertension patients at Simpang Kawat Health Center had limited knowledge, with 88.4% in the "poor knowledge" category. After the intervention, the percentage of patients with poor knowledge decreased to 41.9%.

Meanwhile, at Talang Bakung Health Center, the majority of patients had limited knowledge before the intervention, with 87.2% in the "poor knowledge" category. After the intervention, the percentage of patients with poor knowledge decreased to 60.5%.

Table 1. Frequency Distribution of Prolanis Hypertension Patients at Simpang Kawat and Talang Bakung Health Centers Based on Knowledge Level of Family Medicine Services

Knowledge of Family Medicine Services	Simpang Kawat Health Center (Experiment)		Talang Bakung Health Center (Control)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Pre-test				
Poor	38	88.4	34	87.2
Fair	4	9.3	5	12.8
Good	1	2.3	0	0

Knowledge of Family Medicine Services	Simpang Kawat Health Center (Experiment)		Talang Bakung Health Center (Control)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage(%)
Post-test				
Poor	18	41.9	26	60.5
Fair	18	41.9	12	27.9
Good	7	16.3	1	2.3

Table 4 shows the pre-test and post-test results on family medicine knowledge based on the frequency of correct answers. In the experimental group at Simpang Kawat Health Center, the highest increase was observed in question number 15, with the correct answer frequency increasing from 20.9% in the pre-test to 72.1% in the post-test. The most significant decrease in correct answers was observed in question number 11, with a pre-test value of 51.2% and a post-test value of 39.5%. Question

number 14 showed no change, with the pre-test and post-test values at 65.1%. Meanwhile, in the Talang Bakung Health Center control group, the highest increase was observed in question number 15, with the correct answer frequency increasing from 33.3% in the pre-test to 66.7% in the post-test. The most significant decrease in correct answers was observed in question number 10, with a pre-test value of 15.4% and a post-test value of 12.8%.

Table 2. Description of Pre-test and Post-test Results on Family Medicine Knowledge in Prolanis Hypertension Patients at Simpang Kawat and Talang Bakung Health Centers

No.	Knowledge items	Number of Respondents Answering Correctly at Simpang Kawat Health Center (Experiment)		Number of Respondents Answering Correctly at Talang Bakung Health Center (Control)	
		Pre-test	Post-test	Pre-test	Post-test
1.	Definition of Family Doctor Service	23 (53.5%)	35 (81.4%)	26 (66.7%)	32 (82.1%)
2.	Main Purpose of Family Medicine Service	19 (44.2%)	23 (53.5%)	16 (41%)	22 (56.4%)
3	Implementers of Family Medicine Service	22 (51.2%)	39 (90.7%)	23 (59%)	35 (89.7%)
4	Principles of Family Medicine Service	23 (53.5%)	29 (67.4%)	17 (43.6%)	19 (48.7%)
5	Family Doctor Conducts Risk Factor Observation	36 (83.7%)	40 (93%)	32 (82.1%)	36 (92.3%)
6	Family Doctor Conducts Patient Job Survey	14 (32.6%)	24 (55.8%)	12 (30.8%)	14 (35.9%)
7	Family Doctor Follows Up on Services	15 (34.9%)	30 (69.8%)	11 (28.2%)	13(33.3%)
8	Principle of Comprehensive Service	12 (27.9%)	16 (37.2%)	23 (59%)	26 (66.7%)

No.	Knowledge items	Number of Respondents Answering Correctly at Simpang Kawat Health Center (Experiment)		Number of Respondents Answering Correctly at Talang Bakung Health Center (Control)	
		Pre-test	Post-test	Pre-test	Post-test
9	Family Doctor Prevents Diseases	4 (9.3%)	10 (23.3%)	5 (12.8%)	7 (17.9%)
10	Family Doctor Conducts Medical Rehabilitation	12 (27.9%)	20 (46.5%)	6 (15.4%)	5 (12.8%)
11	Family Doctor Collaborates with Various Sectors	22 (51.2%)	17 (39.5%)	10 (25.6%)	12 (30.8%)
12	Types of Family Doctor Services	12 (27.9%)	30 (69.8%)	8 (20.5%)	14 (35.9%)
13	Family Doctor Provides Multiple Services	18 (41.9%)	20 (46.5%)	16 (41%)	18 (46.2%)
14	Benefits of Family Medicine Services	28 (65.1%)	28 (65.1%)	23 (59%)	30 (76.9%)
15	Choosing a Primary Care Doctor	9 (20.9%)	31 (72.1%)	13 (33.3%)	26 (66.7%)

Table 5 shows that a Paired Sample T-test was performed on the mean results of the pre-test (before the intervention) and post-test (after the intervention) for both the experimental and control groups. The significance level was found to be < 0.05 for both the experimental group (p -value = 0.000) and the control group (p -value = 0.000). Therefore, based on the statistical analysis, it can be concluded that there is a

significant difference between the mean pre-test and post-test scores in each group, both in the experimental group with the AI educational video method for family medicine services and in the control group with the slide method for family medicine services. In other words, both the AI educational video and the slide method for family medicine services improved knowledge about family medicine services.

Table 3. Results of Paired Sample T-test Analysis

Group	Mean \pm SD	Confidence Interval 95%	P-value
Ekspériment			
Pre-test	6.26 \pm 2.489	5.49-8.48	0.000
Post-test	9.12 \pm 2.061	7.02-9.75	
Control			
Pre-test	6.18 \pm 1.715	5.62-7.38	0.000
Post-test	7.92 \pm 1.660	6.74-8.46	

Table 6 shows the results of the Independent T-test conducted on the average pre-test and post-test results for both the experimental and control groups. The results of the Independent T-test

indicate that the significance level for the pre-test was > 0.05 (p -value = 0.873), while for the post-test, the significance level was < 0.05 (p -value = 0.005). Therefore, it can be concluded that there was no significant

difference in the average pre-test scores between the experimental and control groups. However, there was a substantial difference in the post-test scores between the experimental and control groups. In other words, the initial knowledge of both the experimental and control groups before the intervention was the same. After the

intervention, the application of AI video education methods helped better understand hypertension patients in the experimental group than the standard slide method. The AI video education for family medicine resulted in a higher average knowledge score compared to the standard slide method for family medicine education.

Table 4. Results of Independent T-test Analysis

Group	Mean ± SD	Confidence Interval 95%	P-value
Pre-test			
Eksperiment	6.26 ± 2.489	5.49-5.62	0.873
Control	6.18 ± 1.715	7.02-6.74	
Post-test			
Eksperiment	9.12 ± 2.061	8.48-7.38	0.005
Control	7.92 ± 1.660	9.75-8.46	

DISCUSSION

Description of the Characteristics of Hypertension Prolanis Patients at Puskesmas Simpang Kawat and Talang Bakung

The characteristics of hypertension patients in the Prolanis program are categorized by age, gender, and education. Based on age, the majority of hypertension patients at Puskesmas Simpang Kawat are in the adult category, ranging from 19 to 59 years, while at Puskesmas Talang Bakung, the majority are elderly, aged 60 years and older. Various demographics, social factors, and accessibility to healthcare services may influence the difference in age characteristics between the two locations. Based on age characteristics in health education activities from Rita Halim et al. at Puskesmas Pakuan Baru in 2022, most

hypertension patients were over 60 years old.²⁰ This same characteristic of age in Prolanis hypertension patients was also found in research by Muhammad Nur Siddiq at Puskesmas Purwodiningratan, Surakarta, in 2019, where the majority were in the elderly category.²¹ The same finding on age characteristics was noted in the study by Novi et al. at Puskesmas Banyumas District East Region in 2021, where most Prolanis hypertension patients were 60-89 years old.²² However, a different characteristic was observed in the study by Lutfiatul et al. at Puskesmas Muara Satu, Lhokseumawe City in 2024, where most patients were in the 46-55 years age category.²³ Based on previous studies, it can be concluded that each puskesmas may have a different age distribution for Prolanis hypertension patients.

Based on education, most Prolanis hypertension patients at Puskesmas Simpang Kawat and Puskesmas Talang Bakung have a basic education level. This finding aligns with the educational characteristics of Prolanis hypertension patients in a study by Lutfiatul et al. in 2024 at Puskesmas Muara Satu, Lhokseumawe City, where most patients had elementary and middle school education.²³ Similarly, the study by Novi et al., in 2023 at Puskesmas Kabupaten Banyumas Wilayah Timur, reported that most Prolanis hypertension patients had an elementary school education.²² A basic education level indicates a higher risk of developing hypertension, potentially due to a lack of health knowledge among Prolanis patients.²⁴

An overview of the knowledge of family medicine services among Prolanis hypertension patients at Simpang Kawat Health Center and Talang Bakung Health Center.

The study results on the level of knowledge about family medicine services before the intervention showed that 88.4% of respondents at Puskesmas Simpang Kawat and 87.2% at Puskesmas Talang Bakung had a low level of knowledge. This aligns with the study by Zahidah (2022) conducted at Puskesmas Kota Jambi, where 72.5% of respondents were found to have little understanding of family medicine services.³ After the educational intervention, there was an improvement,

with the percentage of respondents with low knowledge decreasing to 41.9% at Puskesmas Simpang Kawat and 60.5% at Puskesmas Talang Bakung. This decrease indicates an improvement in respondents' knowledge levels.

The frequency of correct answers for each question, as shown in Table 4.4, indicates that the highest increase in correct responses in the experimental and control groups was for question number 10, concerning the selection of primary care physicians. This suggests a growing interest among prolanis hypertension patients, who initially preferred specialists or general practitioners at health centers, in choosing family doctors. The increase in preference for family doctors reflects a heightened awareness among prolanis patients about the benefits of family medicine services, which offer more holistic and coordinated care, especially in improving quality and providing greater opportunities for patient education regarding specific health conditions.²⁵

On the other hand, there was a decrease in the frequency of correct answers for question number 11 in the experimental group and question 10 in the control group. Question 11 addressed the principles of family medicine services collaborating with other health service sectors. The decline in correct answers could be attributed to using terms related to principles that may have been unfamiliar to the patients. This may be linked to the cognitive decline often experienced by

prolanis hypertension patients, where aging can lead to reduced cognitive function, making it harder to understand new terminologies.²⁶⁻²⁸ Meanwhile, the decline in correct answers for question 10 in the control group, which focused on the role of family doctors in medical rehabilitation, might be due to the slide presentation only mentioning examples of family doctors performing physiotherapy in patient rehabilitation without providing detailed explanations of such physiotherapy activities.

Furthermore, for question 14 about the benefits of family medicine services, there was no change in the frequency of correct answers in the experimental group. This indicates that the AI video might not have sufficiently detailed the benefits of family medicine services.

The effect of AI video and slides on the level of knowledge about family medicine services among Prolanis hypertension patients at Simpang Kawat Health Center and Talang Bakung Health Center.

The impact of the AI video on the experimental group can also be observed from the mean pre-test score of 6.26 ± 2.489 and the post-test score of 9.12 ± 2.061 , which was statistically significant (p -value = 0.000). The AI video provided a comprehensive explanation of family medicine services through animations, offering clear and detailed information to prolanis hypertension patients. The colorful

and dynamic animations were highly appealing to all demographics, particularly women. This finding aligns with a study by Siska Oktarina (2023), which demonstrated a greater increase in knowledge scores after an animated educational video intervention compared to pre-intervention scores among pre-elderly individuals.²⁹ Similarly, Grasella Nur Alviolita (2021) found significant differences between pre- and post-intervention results when videos were provided to elderly participants.³⁰

On the other hand, the impact of the standard method using slides can be observed from the mean pre-test score of 6.18 ± 1.715 and post-test score of 7.92 ± 1.660 , which was also statistically significant (p -value = 0.000). This indicates that the slide method also influenced the knowledge of the control group. This finding aligns with a study by Haris et al. (2019), which reported differences in the mean knowledge scores before and after health education using PowerPoint among elderly participants.³¹ Similarly, Nur Khoiron's study (2014) showed a significant difference in early detection knowledge before and after health education conducted with PowerPoint media.³²

The difference in knowledge levels between Prolanis hypertension patients who use the artificial intelligence video education method and those who use the standard education method.

Providing health education about family medicine services using AI educational videos revealed a higher average post-test score in the experimental group compared to the control group, which received standard slide-based methods. The experimental group achieved a mean post-test score of $9,12 \pm 2,061$, while the control group achieved $7,92 \pm 1,660$, with a statistically significant difference (p -value = 0.005). This indicates a difference in the level of knowledge about family medicine services between patients educated using AI educational videos and those educated with standard methods in the Prolanis hypertension program. The advantage of AI video lies in its ability to provide excellent visualization and facilitate knowledge absorption. Video methods yield better learning outcomes for remembering, recognizing, and connecting facts and concepts.³³ Additionally, as times change, studies have shown that traditional methods such as leaflets, PowerPoint presentations, booklets, and flipcharts are less effective in enhancing knowledge, as they are text-heavy and can cause fatigue.³⁴⁻³⁷

In contrast, AI video animation has several advantages over other media because it can make abstract lessons more concrete through animated visualizations. This approach makes learning more meaningful and easier to accept and understand.³⁸ A study by Zhou et al. (2020) at Tongji Hospital found that video usage improved satisfaction in delivering and

receiving information, increased comprehension levels, and enhanced evaluation outcomes compared to conventional methods.³⁹ Similarly, research by Rahmi et al. (2021) reported that animated video media was more effective than PowerPoint presentations in improving the knowledge of young women regarding menarche.⁴⁰

CONCLUSION

The characteristics of hypertensive Prolanis patients at Simpang Kawat Health Center are dominated by adult patients, comprising 55.8% of the respondents, 86% female, and 44.2% with a primary education. In contrast, at Talang Bakung Health Center, hypertensive Prolanis patients are primarily elderly, accounting for 76.9% of the respondents, 100% female, and 74.4% with primary education. Regarding the knowledge level of hypertensive Prolanis patients at Simpang Kawat Health Center before receiving education using an AI-based video method, 88.4% had insufficient knowledge. However, after the education was provided, a positive change occurred, with the percentage of patients with poor knowledge decreasing to 41.9%, reflecting a significant improvement in understanding. Meanwhile, at Talang Bakung Health Center, where standard education methods were used, 87.2% of patients had insufficient knowledge before the intervention. After receiving education, this percentage dropped to 60.5%,

indicating a notable improvement in patients' knowledge. Analysis revealed a significant difference in the mean knowledge scores regarding family medicine services between the group receiving AI-based video education and the group receiving standard education methods for hypertensive Prolanis patients, with the average score being higher in the AI-based video group.

RECOMMENDATIONS

It is recommended that Simpang Kawat Health Center and Talang Bakung Health Center incorporate AI-based video education into their routine programs to educate Prolanis patients, particularly those with hypertension and diabetes mellitus (DM). This video can assist patients in understanding how to manage

their conditions through medication adherence and lifestyle changes. Healthcare providers, especially doctors and nurses, are encouraged to actively utilize AI-based educational technology to deliver more personalized and effective services, including modifying videos to meet the needs of other patients. Hypertensive Prolanis patients should be encouraged to actively participate in AI-based health education programs to understand their conditions better and adopt healthier lifestyles. For future researchers, it is suggested that studies be expanded on the impact of AI in educating patients with other chronic diseases, such as diabetes or heart disease, and more health centers should be involved for more representative research outcomes.

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