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The Relationship Between Level of Health Knowledge and use of Herbal Therapy for Hypertension Patients at Aldehia (One-Sere, Casmuto, Suli-Ua) Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau, Timor Leste

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Abstract. *This study aims to analyse the relationship between the level of health knowledge and the use of herbal therapy in hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau, Timor Leste in 2024. This study used a quantitative design with a cross-sectional approach. The study population consisted of hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau, Timor Leste in 2024. The sample was selected by random sampling. Data were collected through a structured questionnaire with variables of health knowledge, use of herbal therapy, and other factors that influence the decision to use herbal therapy.65% of hypertensive patients have a low level of health knowledge and 67.5% do not use herbal therapy. There was a significant relationship between the level of health knowledge and the use of herbal therapy. Statistical tests showed that a better level of health knowledge tended to be associated with increased use of herbal therapy, with a significant p-value (p = 0.000), which suggests that health knowledge influences patients' decision to adopt herbal therapy. Education level was significantly associated with herbal therapy use (p = 0.015), where higher education level increased the likelihood of herbal therapy use (Exp(B) = 2.034). This study shows the importance of improving health knowledge and education in influencing the use of herbal therapy among hypertensive patients.*

Keywords *Hypertension, Health Knowledge, Herbal Therapy*

1. INTRODUCTION

Hypertension is often caused by genetics and unhealthy lifestyles, such as excessive salt consumption, lack of exercise, stress, and smoking and alcohol. According to (WHO, 2018) Tobacco use rates among adults (18-69 years) in Timor Leste were 56.1% of adults were tobacco users, with 48.6% being active smokers, and 19.8% using smokeless tobacco. Among adolescents (13-15 years), 35% reported using tobacco (WHO, 2018). According to the latest WHO data published in 2020, Alcohol-Related Deaths in Timor-Leste reached 5 or 0.07% of total deaths. The age-adjusted mortality rate was 0.62 per 100,000 population, ranking Timor-Leste 137th in the world (WHO, 2020). Diseases such as obesity and diabetes also compound this risk, making it a health challenge to watch out for.

In 2019, approximately 141,000 adults aged 30-79 years in Timor Leste were living with hypertension. This equates to 37% of the population in that age group (WHO, 2019). Only 23% of those with hypertension were diagnosed with hypertension and of those diagnosed, 11% received treatment. However, only 7% of those treated achieved adequate blood pressure control (with blood pressure below 140/90 mmHg) (WHO, 2019).

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Based on (WHO, 2019) and (Director-General of Statistics Timor-Leste, 2022) the population of Timor Leste in 2022 is 1,340,513 people with the age group of 30-79 years about 50% usually covering about 50% of the total population with a number of 670,257. The prevalence of hypertension among adults aged 30-79 years is 37%, resulting in 248,995 people with hypertension. Assuming Timor Leste's population growth rate is about 2% per year, we can expect the adult population in 2024 to be 698,348. It is estimated that by 2024, approximately 258,389 people in Timor Leste will have hypertension. Timor-Leste has set national targets to control blood pressure, but measurement of salt or sodium consumption has not been done thoroughly at the national level. This suggests that while there are efforts to manage hypertension through blood pressure control, other aspects such as salt consumption control have not received adequate attention (WHO, 2019).

Baucau District is one of the districts in eastern Timor-Leste and is the second largest district after Dili. In 2022, Baucau District had a total population of 54,964 (City Population, 2022). If the population growth rate in Baucau is estimated to be around 2% per year, then the total population in 2024 will reach 57,019 people. Assuming that the proportion of the adult population is about 50% of the total population, the number of adults in Baucau in 2024 is estimated to be 28,510. Based on the national hypertension prevalence of 37% (WHO, 2019), it is estimated that approximately 10,548 adults in Baucau District may have hypertension in 2024.

Buruma village, located in Posto Administrativo Baucau, had a population of 4,062 in 2022 (City Population, 2022). If the annual population growth rate of the village is the same as Baucau district, which is around 2%, then by 2024 the population of Buruma will reach around 4,225 people. With a national hypertension prevalence of 37% (WHO, 2019), it is estimated that there are approximately 1,562 adults in Buruma who may have hypertension in 2024.

Based on the above data, as a developing country with an increasing prevalence of hypertension, Timor-Leste faces great challenges in public health management, especially in the Baucau region, specifically in Buruma Village. Although herbal therapy has potential as a natural treatment method with minimal side effects, its use is still very limited among hypertensive patients. The main factor influencing this low usage is the lack of public health knowledge, resulting in a preference for conventional medicine.

2. LITERATURE REVIEW

Theory of hypertension

a. *Definition of hypertension.*

Hypertension as a Cardiovascular Disease: Hypertension is often referred to as a common chronic cardiovascular disease and is a major risk factor for a variety of serious diseases, including stroke, coronary heart disease, and heart failure. Hypertension is defined as a condition in which blood pressure in the arteries is persistently above normal limits, generally measured by systolic pressure above 140 mmHg and diastolic pressure above 90 mmHg (Asmelashe Gelayee et al., 2017). Global Definition of Hypertension: Hypertension is globally defined as an increase in systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg, or a condition in which a person uses antihypertensive drugs to control blood pressure. This definition is widely accepted in clinical guidelines in various countries (Asmelashe Gelayee et al., 2017).

From the three opinions above, it can be concluded that hypertension is a serious health condition characterised by chronically elevated blood pressure and is the main cause of various cardiovascular diseases. Although often asymptomatic in its early stages, hypertension can cause significant organ damage and increase the risk of death if not properly managed. Therefore, the importance of regular blood pressure monitoring and health education on hypertension management, including the use of safe and effective herbal therapies, is vital in preventing further complications.

b. *Symptoms of Hypertension*

Headaches, especially in the back of the head (occipital), may occur in people with uncontrolled high blood pressure. The mechanism is related to increased intracranial pressure due to a persistent increase in arterial pressure. When blood pressure is very high, the blood vessels in the brain are forced to work harder, which can cause severe headaches or even cerebral haemorrhage in severe cases of hypertension (hypertensive crisis).

Uncontrolled increases in blood pressure can affect blood flow to the brain, leading to feelings of dizziness or vertigo. Increased resistance in the arteries leads to unstable blood flow, which can affect brain balance and function. Vertigo may also appear as a symptom when blood flow to the vestibular part of the brain is impaired.

Shortness of breath can occur because high blood pressure can lead to heart failure, especially left-sided heart failure. Untreated elevated blood pressure causes the heart to work harder, which eventually leads to weakening of the heart muscle. This inhibits the heart's

efficiency in pumping blood, causing fluid build-up in the lungs (pulmonary oedema), leading to breathing difficulties.

c. *Blood Pressure Control*

Blood pressure control is essential to prevent cardiovascular complications and maintain cardiovascular health. Based on the classification of blood pressure, each category requires a different approach to management (American Heart Association, n.d.): In individuals with blood pressure in the normal category (systolic <120 mmHg and diastolic <80 mmHg), it is very important to maintain heart-healthy habits. This includes following a balanced diet, such as a high-fibre, low-salt diet, and engaging in regular physical activity. These measures aim to prevent the occurrence of elevated blood pressure in the future.

High (Elevated) Blood Pressure: For individuals who have high or 'elevated' blood pressure (systolic 120-129 mmHg and diastolic <80 mmHg), early intervention is essential. Collaboration with healthcare professionals is required to modify lifestyle, which includes reduced salt consumption, increased physical activity, and stress management, to prevent further progression of hypertension.

Stage 1 Hypertension: In stage 1 hypertension (systolic 130-139 mmHg or diastolic 80-89 mmHg), lifestyle changes are the main intervention. However, if there are additional cardiovascular risk factors, such as a history of heart disease, stroke, diabetes, or kidney disease, the administration of antihypertensive drugs should be considered by health professionals to reduce the risk of complications. Stage 2 Hypertension: In stage 2 hypertension (systolic ≥140 mmHg or diastolic ≥90 mmHg), antihypertensive treatment is almost always required in addition to lifestyle modifications. At this stage, the risk of cardiovascular complications increases significantly so intensive management by medical personnel is highly recommended.

Hypertensive Crisis: In a hypertensive crisis (systolic >180 mmHg and/or diastolic >120 mmHg), individuals require immediate medical attention as this condition can lead to serious complications, such as stroke, heart attack or kidney failure and delays in treatment can be fatal.

Health Knowledge

Health Knowledge in the Context of Hypertension: In the context of hypertension, health knowledge plays an important role in self-management, including an understanding of the disease, treatment, and lifestyle changes needed to control blood pressure. Good knowledge of

hypertension enables individuals to adhere to treatment, adopt a healthy lifestyle, and prevent more serious complications (Pradeep K. Yadav et al., 2018).

Social and Cognitive Aspects of Health Knowledge: Health knowledge also includes cognitive and social skills that determine a person's motivation and ability to access, understand, and use health information in ways that promote and maintain their health. This includes the ability to interpret medical information and make informed decisions based on that understanding (Mourouti et al., 2022).

Health knowledge is a critical aspect of disease management, particularly in the context of chronic conditions such as hypertension. With a good understanding of health information, individuals can make more informed decisions regarding treatment and self-care, which can ultimately improve health outcomes and quality of life. In the management of hypertension, adequate knowledge of the disease and required treatments is essential to ensure adherence to medication and effective adoption of a healthy lifestyle. Therefore, improving health knowledge among patients is an important priority in chronic disease prevention and control efforts.

Relationship between Health Knowledge and Herbal Therapy Use

Health knowledge plays an important role in influencing the use of herbal therapies among the public. Studies have shown that individuals who have better knowledge about certain health conditions and available treatment options tend to be more open to the use of alternative therapies, including herbs. For example, in a study by (Asmelashe Gelayee et al., 2017), it was found that understanding of the benefits and risks of herbal therapies significantly influenced individuals' decisions to use herbal medicines in the management of their health conditions. This study highlights that good knowledge about herbs and their effects can increase the trust and use of herbal medicines.

Furthermore, in a study conducted by (Pradeep K. Yadav et al., 2018), knowledge regarding hypertension and its management was found to have a significant association with physical activity levels and sleep patterns among individuals at risk of developing hypertension. This study indicates that better knowledge about health conditions may encourage the adoption of healthy behaviours, including the use of non-pharmacological therapies such as herbal therapies.

Age, gender, education level, and socio-economic conditions play an important role in determining whether someone will use herbal therapies. Age influences preferences based on life experiences, gender influences due to roles in family medicine, education level influences

access to and understanding of information, while socio-economic factors influence due to affordability and accessibility of therapies. Understanding these factors is important for designing more effective health interventions that cater to the needs of a diverse demographic.

Better access to health information is directly related to increased use of herbal therapies. When individuals have access to accurate sources of information, such as health professionals, medical literature, or trustworthy media, they are more likely to understand the benefits and risks of herbal therapies. This, in turn, encourages the adoption of herbal therapy as a treatment option. According to (Asmelashe Gelayee et al., 2017), individuals who get information more frequently from reliable sources tend to be more open and trusting towards the use of herbal therapies.

Research Hypothesis

a. *Null Hypothesis (H_0):*

There is no significant relationship between the level of patients' health knowledge and the use of herbal therapy in hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024.

b. *Alternative Hypothesis (H_1):*

There is a significant relationship between the level of patient health knowledge and the use of herbal therapy in hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024.

c. *Null Hypothesis (H_0):*

There are no other significant factors, other than health knowledge, that influence the use of herbal therapy among hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024.

d. *Alternative Hypothesis (H_1):*

There are other significant factors, besides health knowledge, that influence the use of herbal therapy among hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024.

3. METHODS

Quantitative research design with a cross-sectional approach is one type of research design used to measure or observe variables at one specific point in time in a population. This survey will use a structured questionnaire to collect data from respondents regarding their level

of health knowledge, use of herbal therapies, and other factors that may influence their decision in choosing a therapy. This study was conducted in Baucau District in Timor Leste. Precisely in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma this research has been implemented in October 2024, and continued other activities with a total duration of about four months. The research period from 28 August 2024 to 31 December 2024 provided sufficient time to complete all stages of the research in a structured and comprehensive manner.

This study will be conducted in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024 which have been selected based on criteria of hypertension prevalence and other relevant factors. The study population included hypertensive patients residing in Baucau District. The total population of Baucau District is expected to increase from 54,964 in 2022 (City Population, 2022) to 57,019 in 2024, assuming a population growth rate of 2% per year. Based on the national hypertension prevalence of 37% (WHO, 2019), it is estimated that approximately 21,097 people in Baucau District in 2024 may have hypertension. This incidence of hypertension in the total population gives an idea of the disease burden in the region.

Data Cleaning: The first step is to perform data cleaning. This involves checking the data that has been collected to identify missing, invalid or duplicate data. Data Coding: After data cleaning, the next step is coding. This means converting qualitative or categorical answers into specific numbers or codes. For example, an answer of ‘Using’ or ‘Not Using’ can be coded as 1 for ‘Using’ and 0 for ‘Not Using’. Data Tabulation: After the data has been coded, it is entered into a table or worksheet to facilitate further processing. This process is called data tabulation. Data Processing: Data that has been cleaned and coded is further processed to prepare for analysis. This may include data transformation, such as normalisation or data clustering.

Univariate analysis is an analytical technique used to analyse one variable at a time. Bivariate analysis in this study was conducted to examine the relationship between two variables, namely the independent variable and the dependent variable, as well as confounding factors that might affect the relationship. This analysis aimed to answer the problem formulation and achieve the research objectives, which emphasised the relationship between hypertension patients' level of health knowledge and use of herbal therapy in Baucau District, Timor Leste. In addition, bivariate analysis was also used to identify other factors that may influence the use of herbal therapy, such as age, gender, education level and socioeconomic status.

4. RESULTS & DISCUSSION

Factors influencing the use of herbal therapy among hypertensive patients in Suco Buruma District Baucau Timor Leste. The table below is a Linear Regression Table of Age, Knowledge, Gender, Education Level, and Socioeconomic Status as predictors for Herbal Use among hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau, Timor Leste in 2024.

Table 1. Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Jenkel	.138	.306	.204	1	.652	1.148
	TkPend	.710	.291	5.952	1	.015	2.034
	Sosek	-.162	.376	.187	1	.666	.850
	Usia	.020	.310	.004	1	.948	1.020
	Constant	-1.384	1.563	.784	1	.376	.251

a. Variable(s) entered on step 1: Jenkel, TkPend, Sosek, Usia.

The coefficient of gender is B = 0.138, with Exp(B) = 1.148 and p = 0.652. The p value is greater than 0.05 indicating gender is not significantly associated with the decision to use or not use herbs. Although Exp(B) = 1.148 indicates gender slightly affects the use of herbs, and this is not statistically significant. The coefficient for education level is B = 0.710, with Exp(B) = 2.034 and p = 0.015. The value of p = 0.015, which is smaller than 0.05, indicates that education level has a significant relationship with herbal use. Exp(B) = 2.034 means that each increase in education level will increase one's likelihood of using herbs by about two times. This suggests that people with higher education levels tend to use herbal therapy more than those with lower education levels.

The coefficient for socioeconomic status is B = -0.162, with Exp(B) = 0.850 and p = 0.666. The value of p = 0.666 which is greater than 0.05 indicates that socioeconomic status is not significantly associated with herbal use. Although Exp(B) = 0.850 indicates that socioeconomic status slightly reduces one's likelihood of using herbs, this relationship is not statistically significant. This means that socioeconomic status does not have a significant influence on the decision to use herbs.

The coefficient for age is B = 0.020, with Exp(B) = 1.020 and p = 0.948. The p value = 0.948, which is much greater than 0.05, indicates that age is not significantly related to herbal use. Exp(B) = 1.020 indicates that each one year increase in age only increases the probability of herbal use by about 2%. However, this relationship was not significant, meaning that age did not substantially influence the decision to use herbal therapy. The coefficient for the constant is B = -1.384, with Exp(B) = 0.251 and p = 0.376. The p value = 0.376 which is greater

than 0.05 indicates that the intercept or model constant is not significant. The value Exp(B) = 0.251 shows that the possibility of using herbs when all independent variables are zero is very small, only around 25%. However, this result is not statistically significant.

From the results of this logistic regression it can be concluded that only education level shows a significant relationship with herbal use, with increasing education level increasing a person's likelihood of using herbs. Other variables, such as gender, socioeconomic status, and age, were not significantly related to herbal use, because the p value for these variables was greater than 0.05, indicating that they did not have a significant influence on herbal use decisions in the sample.

This finding is in line with literature which shows that decisions to use herbal therapy are more influenced by other factors, such as health literacy, product accessibility, and belief in the effectiveness of herbal therapy. (Mourouti et al., 2022) stated that the level of health literacy has a greater role in influencing the decision to use herbal therapy, compared to demographic factors such as gender. In the context of health literacy, individuals who have better knowledge about the benefits and safety of herbal therapies tend to be more open to their use, regardless of their gender.

The coefficient for education level is B = 0.710, with Exp(B) = 2.034 and p = 0.015. The p value = 0.015, which is smaller than 0.05, indicates that the level of education has a significant relationship with herbal use. Exp(B) = 2.034 means that each increase in education level will increase a person's probability of using herbs approximately twofold. The results of logistic regression analysis show that education level has a significant relationship with the decision to use herbal therapy. The value of B = 0.710, Exp(B) = 2.034, and p = 0.015 indicates that every increase in one level of education increases a person's odds of using herbal therapy approximately twofold. With a p value smaller than 0.05, it can be concluded that education level is an important factor in determining the use of herbal therapy.

These findings suggest that individuals with higher levels of education tend to be more open to the use of herbal therapy. This may be explained by better health literacy among highly educated individuals, which allows them to understand the benefits and working mechanisms of herbal therapies better. (Mourouti et al., 2022) supports this by stating that good health literacy, which is often related to education level, plays an important role in driving decisions to use alternative treatments such as herbs.

The results of the logistic regression analysis show that socio-economic status does not have a significant relationship with the decision to use herbal therapy. This is indicated by the values B = -0.162, Exp(B) = 0.850, and p = 0.666. With a p-value greater than 0.05, it can be

concluded that socioeconomic status does not significantly influence a person's decision to use or not use herbal therapy. The value B = -0.162 indicates that there is a slight decrease in the log odds of using herbal therapy as socioeconomic status decreases, but this effect is not strong enough to be considered significant. Meanwhile, the Exp(B) = 0.850 value indicates that individuals with lower socioeconomic status have an 85% chance of using herbal therapy compared to individuals with higher socioeconomic status. However, this difference was not statistically significant, so socioeconomic status cannot be considered a major factor in decision making regarding herbal therapy.

Pradeep supports these findings by stating that perceptions of the effectiveness and safety of herbal therapy, as well as access to evidence-based information, are the main determinants in the adoption of herbal therapy (Pradeep K. Yadav et al., 2018). They note that differences in socioeconomic status do not significantly influence these decisions, especially if individuals have equal access to health information.

The results of the logistic regression analysis show that age does not have a significant relationship with the decision to use herbal therapy. This can be seen from the values B = 0.020, Exp(B) = 1.020, and p = 0.948. With a p value much greater than 0.05, it can be concluded that age is not a factor that significantly influences a person's decision to use or not use herbal therapy.

The value B = 0.020 indicates that there is a slight increase in the log odds of using herbal therapy with increasing age, but this increase is very small and not statistically significant. In addition, the Exp(B) = 1.020 value indicates that every increase in one unit of age only increases the odds of using herbal therapy by 2%. However, the p-value of 0.948 indicates that this relationship is not statistically significant, so age cannot be considered a relevant predictor in decision making regarding the use of herbal therapy.

Pradeep also noted that the decision to use herbal therapy is more influenced by factors such as belief in the effectiveness and safety of herbs and product accessibility, compared to a person's age. This study shows that age does not directly influence decision-making patterns regarding alternative treatments (Pradeep K. Yadav et al., 2018).

These results confirm that age is not the main determinant in the decision to use herbal therapy. Therefore, herbal therapy promotion programs should not focus on certain age groups, but rather on providing relevant information and equal access to all age groups. By increasing health literacy through evidence-based education, all levels of society, regardless of age, can better understand the benefits and safety of herbal therapy.

5. CONCLUSION

Most patients with hypertension in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste in 2024 had a low level of health knowledge of 130 people (65%). Most hypertension patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste Year 2024 did not use herbal therapy of 135 people (67.5%). Education level factor was significantly associated with herbal use ($p = 0.015$), where higher education level increased the likelihood of herbal use with $Exp(B) = 2.034$ among hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste Year 2024. There is a relationship between the level of health knowledge and the use of herbal therapy in hypertensive patients in Aldehia (One-Sere, Casmuto, Suli-Ua), Suco Buruma, Posto Administrativo Baucau, Municipiu Baucau Timor Leste Year 2024.

Patients are expected to actively attend health counselling at health centres or local communities and seek information from trusted sources such as health workers or health facility educational media. In addition, they are encouraged to adopt a healthy lifestyle, such as a low-salt diet, regular exercise, and adhere to prescribed medication to prevent or manage hypertension. Developing and delivering simple, visual, and evidence-based educational materials on hypertension, its prevention, and the benefits of herbal therapy are essential to improve patient understanding. Regular health counselling to patients and the community can increase awareness of the importance of hypertension management, both through medical treatment and complementary herbal therapy. In addition, providing safe and effective herbal therapy recommendations based on valid health guidelines can help build patient confidence in their use.

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