Overview of Factors Influencing Medication Adherence in Elderly Hypertension Patients

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ABSTRACT

Hypertension is defined as a sustained increase in blood pressure with a systolic value of ≥140 mmHg and/or a diastolic value of ≥90 mmHg. The risk of developing hypertension increases progressively with age, with a prevalence of more than 60% among individuals over 60 years old (elderly). Treatment success for hypertension depends not only on accurate diagnosis and appropriate therapy but also on patients' adherence to antihypertensive medication. This study aimed to examine the relationship between factors such as knowledge about hypertension and family support with medication adherence among elderly hypertensive patients. Methods: This was an analytical observational study with a cross-sectional design conducted at Hospital X in Denpasar. A total of 70 elderly hypertensive patients participated in the study. Data were collected using the MMAS-8 (Morisky Medication Adherence Scale) to assess medication adherence, and validated questionnaires to measure knowledge of hypertension and family support. Data analysis was performed using the Spearman correlation test. Results: A significant relationship was found between knowledge about hypertension and medication adherence (p=0.000), with a Spearman correlation coefficient of r=0.657, indicating a strong correlation. A significant relationship was also found between family support and medication adherence (p=0.000), with a correlation coefficient of r=0.546, indicating a moderate correlation. Conclusion: Higher levels of knowledge about hypertension and stronger family support are significantly associated with better medication adherence among elderly hypertensive patients. Educational efforts and family involvement are recommended to improve adherence to antihypertensive therapy.

Keywords: Family support; hypertension knowledge; antihypertensive medication adherence.

ABSTRAK

Hipertensi didefinisikan sebagai peningkatan tekanan darah yang berkelanjutan dengan nilai tekanan sistolik ≥140 mmHg dan/atau nilai tekanan diastolik ≥90 mmHg. Risiko terjadinya hipertensi meningkat secara progresif seiring bertambahnya usia, dengan prevalensi lebih dari 60% pada individu berusia di atas 60 tahun (lansia). Keberhasilan pengobatan hipertensi tidak hanya bergantung pada diagnosis yang akurat dan terapi yang tepat tetapi juga pada kepatuhan pasien terhadap pengobatan antihipertensi. Penelitian ini bertujuan untuk mengkaji hubungan antara faktor pengetahuan tentang hipertensi dan dukungan keluarga dengan kepatuhan pengobatan pada pasien hipertensi lansia. Metode: Penelitian ini merupakan penelitian analitik observasional dengan rancangan cross-sectional yang dilakukan di Rumah Sakit X Denpasar. Sebanyak 70 pasien hipertensi lansia berpartisipasi dalam penelitian ini. Data dikumpulkan dengan menggunakan MMAS-8 (*Morisky Medication Adherence Scale*) untuk menilai kepatuhan pengobatan, dan kuesioner yang telah divalidasi untuk mengukur pengetahuan tentang hipertensi dan dukungan keluarga. Analisis data dilakukan dengan menggunakan uji korelasi Spearman. Hasil: Terdapat hubungan yang signifikan antara pengetahuan tentang hipertensi dengan kepatuhan pengobatan (p=0,000), dengan koefisien korelasi Spearman sebesar r=0,657, yang menunjukkan korelasi yang kuat. Terdapat pula hubungan yang signifikan antara dukungan keluarga dengan kepatuhan pengobatan (p=0,000), dengan koefisien korelasi sebesar r=0,546, yang menunjukkan korelasi sedang. Kesimpulan: Tingkat pengetahuan yang lebih tinggi tentang hipertensi dan dukungan keluarga yang lebih kuat secara signifikan berhubungan dengan kepatuhan pengobatan yang lebih baik di antara pasien hipertensi lansia. Upaya edukasi dan keterlibatan keluarga direkomendasikan untuk meningkatkan kepatuhan terhadap terapi antihipertensi.

Kata kunci: Dukungan keluarga; pengetahuan hipertensi; kepatuhan minum obat antihipertensi.

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INTRODUCTION

Hypertension is defined as a sustained increase in blood pressure with a systolic value of ≥140 mmHg and/or a diastolic value of ≥90 mmHg.[1] Hypertension is a significant global health problem and a leading cause of premature death. The global target is to reduce the prevalence of hypertension by 33% between 2010 and 2030 (WHO, 2023). More than 50% of hypertensive patients have cardiovascular risk factors, such as diabetes (15-20%), dyslipidemia (30%), obesity (40%), hyperuricemia (25%), metabolic syndrome (40%), and an unhealthy lifestyle. According to the Indonesian Ministry of Health (2019), of the total deaths of 1.7 million people, 23.7% were caused by hypertension. In the article Hypertension the Silent Killer, in 2013 as many as 25.8% of the population in Indonesia from the results of blood pressure measurements showed indications of hypertension. This figure increased to 34.11% in 2018. According to data from the Bali Provincial Health Office in 2021, the number of hypertension cases in Bali Province reached 555,184 people and this figure increased in 2022 to 562,619 people and in 2022 the city of Denpasar ranked first for hypertension cases in Bali Province, namely 100,569 people (Bali Provincial Health Office, 2023; Denpasar City Health Office, 2023). According to data from the Indonesian Ministry of Health (2019), based on age grouping, the adult category (31-44 years) was 31.6%, followed by the pre-elderly age group (45-54 years) by 45.3% and the elderly (55-64 years old) ranked the highest at 55.2%.[1]

Elderly is an advanced stage in the life process characterized by a natural or physiological decline in the ability of the functions of various organs and body systems to adapt to environmental stress. Reduced activity and chronic diseases precede the onset of old age. This can lead to an increased frequency of diseases in the elderly, one of which is hypertension.[2] The number of cases and deaths due to hypertension can be minimized through non-pharmacological and pharmacological management. Non-pharmacological treatment management can be done by regulating diet with the DASH diet approach (Dietary Approach to Stop Hypertension, reducing salt intake, increasing potassium and magnesium consumption, and exercising regularly.[3]

Success in the treatment of hypertension is not only judged by the accuracy of the diagnosis and selection of therapy, but comes from patient compliance in taking medication. Without patient compliance in taking hypertension medication, there can be enormous negative effects such as the emergence of complications such as stroke, kidney disease, retinopathy (retinal damage), peripheral vascular disease, neurological disorders (Kemenkes RI, 2024). Regardless of the presence of symptoms or not, to avoid this, hypertensive patients need to take medication every day.[4]

According to the Riskesdas of Bali Province (2019), the age group of 65-74 years old is the age group with non-compliance with taking medication, namely not taking medication regularly, which is 29.80%. This is supported by several research results where in a study conducted by Adzani dan Artistin, (2023) stated that as many as 76 elderly respondents that 69.7% had a low level of drinking compliance. The same research conducted by Christiyani *et al.* (2023) as many as 38 respondents (53.5%) had a low level of compliance with taking medication. Non-adherence to taking antihypertensive drugs in the pharmacological management program of hypertension is a big problem for people with hypertension. Some of the reasons that are often expressed by hypertensive patients for not taking medication are often forgetting, the drug is not available, taking traditional medicine, not being able to buy medicine, not regularly taking treatment, and not being able to stand the side effects of drugs such as dizziness, drowsiness, nausea while taking hypertension drugs (Riskesdas Bali Province, 2019). More than 60% of people stated that the reason they did not regularly take medicine was because they felt they were already healthy. It is known that hypertension treatment is a lifelong treatment, so there is no reason not to take antihypertensive drugs regularly.

Factors such as knowledge, family support, access to services, and support from health workers, age, gender, education level, occupation, length of suffering, motivation are factors that influence medication adherence and the possibility of a long treatment that can lead to boredom. This

study is in line with research conducted Susanto dan Purwantingrum (2022), which states that family support has a significant effect on adherence to taking medication. The same research was conducted by Katimenta *et al.* (2023), which states that there is a significant relationship between knowledge and adherence to taking medication, but the research conducted by Nade dan Rantung (2020), stated that family support had no significant effect on adherence to taking medication (p value = 0.748), which means that good or bad family support has no effect on adherence to taking medication. The same research conducted by Arrang *et al.*(2023), which states that the level of knowledge does not have a significant effect on the level of compliance with taking medication (p value = 0.979), which means that the high and low level of knowledge of hypertensive patients does not affect compliance with taking medication. Adherence to treatment is an important factor in maintaining the long-term health and well-being of patients suffering from hypertension. Adherence and compliance are important conditions for the effectiveness of hypertension therapy and the greatest potential for improving hypertension control lies in improving the behavior of these patients while patient non-adherence to antihypertensive drugs is one of the main factors for therapeutic failure (Wirakhmi dan Purnawan, 2021). Medication adherence affects the success and recovery of patients.

Rumah Sakit X Denpasar is a hospital located in Denpasar City as a referral hospital in East Denpasar District. Rumah Sakit X Denpasar is a hospital that provides inpatient and outpatient services, with 12 internal medicine specialists. Rumah Sakit X Denpasar polyclinic services serve general patients, besides that Rumah Sakit X Denpasar has collaborated with national insurance (BPJS) and other private insurance as a referral from the first level health facility and as a service for hypertension cases as many as 726 cases in 2023 and an increase in 2024 of 876 cases obtained from the medical record room. Based on this background, the researcher wants to know the description and relationship of the factors that influence compliance with taking hypertension medication in elderly patients at Rumah Sakit X Denpasar. The factors to be studied are the level of knowledge about hypertension, family support, and compliance with taking medication.
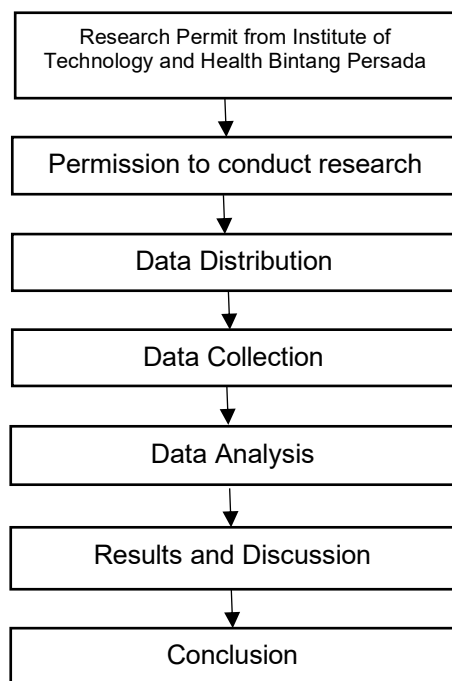
MATERIALS AND METHODS
Research Design

This research design uses analytical observations, namely research conducted by observing the relationship between variables without intervening which aims to identify and evaluate the causes or risks of an event with the approach used, namely cross-sectional because this study measures variables (drug compliance) at a certain time, where respondents are observed once with variable measurements taken at the time of the examination. A total of 70 hypertensive elderly patients were recruited as respondents using purposive sampling. This study was conducted by distributing three questionnaires, namely a questionnaire to assess the level of knowledge of hypertensive patients, a questionnaire of family support for hypertensive patients, and the MMAS-8 questionnaire to assess the level of adherence to taking medication in hypertensive patients. The results of this study will be analyzed to assess the description of factors affecting adherence to taking hypertension medication in elderly patients at Rumah Sakit X Denpasar. This research received ethical clearance from the Health Research Ethics Committee of STIKES Bina Usada Bali, with the ethical approval number: 102/EA/KEPK-BUB-202, issued on 12 March 2025. The ethical approval is valid from 1 March 2025 to 12 March 2026.

Research Procedurs

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Sampling Method

The sampling method used in this research is non-probability sampling, namely purposive sampling. The criteria are as follows

1. Inclusion Criteria
   a. Elderly Hypertension Patients with age ≥ 60 Years
   b. Is an outpatient with a diagnosis of hypertension
   c. Patients with routine control to the outpatient clinic of Rumah Sakit X Denpasar
   d. Willing to be a research respondent by signing informed consent
2. Exclusion Criteria
   a. Illiterate patients
   b. Patients with hearing impairment

Data Analysis Method

Data analysis in this study aims to describe the characteristics of respondents and evaluate the relationship between factors that influence adherence to taking hypertension medication in elderly patients. Data analysis in this study was carried out in two stages, namely univariate analysis and bivariate analysis.

RESULTS AND DISCUSSIONS
Respondent Characteristics Data

Table 1. Respondent Characteristics

Respondent Characteristics	Frequency (n=70)	Percentage (%)
Age		
Elderly (≥60-70 years old)	42	60,0
High-risk elderly (>70 years old)	28	40,0
Gender		
Male	43	61,4
Female	27	38,6
Education		
Elementary school	5	7,1
Junior high school	11	15,7
Senior high school	43	61,5
Higher Education	11	15,7
Job		
Entrepreneur	18	25,7
Retiree	13	18,6
Labourers	5	7,1
Farmer	3	4,3
Not Working	31	44,3
Number of Antihypertensive Medications		
Singles	48	68,6
Combination	22	31,4
Names of Antihypertensive Drugs		
Amlodipine	14	20,0
Amlodipine + Candesartan	21	30,0
Bisoprolol	7	10,0
Candesartan	23	32,9
Captopril	4	5,7
Ramipril	1	1,4

Based on Table 1 above, information is obtained that in the age category, respondents with elderly age were 42 people (60%) while respondents with high-risk elderly were 28 people (40%). Based on gender, respondents with male gender were 43 people (61.4%) while respondents with female gender were 27 people (38.6%). These results are in accordance with research conducted by Dhrik *et al*. (2023) who said that most of the age of hypertensive patients were elderly ≥60 with a percentage (51.3%). As many as 43 people (61.4%) of respondents who suffered from hypertension were male far more than women who were only 27 people (38.6%). These results are in line with research conducted by Artini *et al*.

(2022), which states that the prevalence of hypertension in men is greater than that of women, which is 59.1%. Men are more likely to experience increased blood pressure which has an impact on hypertension problems because men tend to have a less healthy lifestyle than women such as smoking and consuming coffee which can be a contributing factor to increased blood pressure.

Based on education, respondents with high school education had the highest frequency of 43 people (61.5%) and the lowest was elementary school education as many as 5 people (7.1%). These results are in accordance with research conducted by Artini *et al*. (2022), which states that the prevalence of hypertension in men is higher than in women, at 59.1%. Men are more likely to experience an increase in blood pressure that leads to hypertension because they tend to have less healthy lifestyles than women, such as smoking and consuming coffee, which can be factors that cause an increase in blood pressure.

The majority of respondents had a final education level at the senior high school (SMA) level, as many as 43 people (61.5%). This study is in line with the Central Bureau of Statistics in Indonesia that as many as 30.85% of the majority graduated from high school. A higher level of education tends to contribute to a better understanding of the importance of blood pressure control and medication adherence [14].

Based on occupation, the highest frequency of respondents who did not work was 31 people (44.3%) and the lowest was respondents with jobs as farmers as many as 3 people (4.3%). Based on antihypertensive drugs consumed, respondents with a single drug were 48 people (68.6%) while respondents with a combination of drugs were 22 people (31.4%). Based on the name of the antihypertensive drug, the most consumed by respondents was candesartan as many as 23 people (32.9%) and the least was ramipril, namely 1 person (1.4%). These results are in accordance with research conducted by Annisya *et al*. (2024), which states that 68.2% of respondents are unemployed. People who work have a lower risk of developing hypertension than those who are unemployed.[15]

Most respondents took antihypertensive drugs in the form of single therapy (monotherapy), namely 48 people (68.6%). Single therapy in hypertension patients is generally given at the initial stage of treatment or in patients who have not experienced complications. Single therapy is preferred to minimize these risks and facilitate blood pressure control and improve patient compliance.[16]

The type of drug most consumed by respondents was Candesartan, namely 23 people (32.9%). The use of Candesartan is a class of Angiotensin Receptor Blocker (ARB), which can be used for therapy of patients with hypertension. This group has the same effectiveness as Angiotensin Converting Enzym Inhibitor (ACEI). ARBs cause vasodilation, increased excretion of Na + and fluid (reducing plasma volume), reduce vascular hypertrophy so as to lower blood pressure.[17]

Knowledge of Hypertension Patients in Rumah Sakit X Denpasar

Based on the results of research conducted at Rumah Sakit X Denpasar, the frequency distribution of knowledge of hypertensive patients is as follows.

Table 2. Frequency Distribution of Respondents' Knowledge of Hypertension Patients at Rumah Sakit X Denpasar

No.	Knowledge	Frequency (n=70)	Percentage (%)
1.	Good	58	82,9
2.	Fair	12	17,1
3.	Poor	0	0

Based on Table 2 above, the frequency distribution of knowledge of hypertensive patients at Rumah Sakit X Denpasar can be seen that out of 70 respondents who were well informed were 58 people (82.9%), while those with sufficient knowledge were 12 people (17.1%). The results obtained are in line with research conducted by Telaumbanua dan Rahayu (2021), where as many as 76% of respondents have good knowledge and 24% of respondents with poor knowledge. Without knowledge, a person will not be able to make decisions or determine actions or behaviours in response to problems they are facing.

Family Support for Hypertension Patients at Rumah Sakit X Denpasar

Based on the results of research conducted at Rumah Sakit X Denpasar, the frequency distribution of family support for hypertensive patients is as follows.

Table 3. Frequency Distribution of Family Support for Respondents with Hypertension at Rumah Sakit X Denpasar

No.	Family Support	Frequency (n=70)	Percentage (%)
1.	Height	63	90,0
2.	Low	7	10,0

Based on Table 4.3 above, the frequency distribution of family support for hypertensive patients at Rumah Sakit X Denpasar can be seen from 70 respondents who have high family support as many as 63 people (90%), while those who have high family support are 7 people (10%). These results are in accordance with research conducted by Novianti *et al.* (2022), where 54.9% have good family support. In this case, families suffering from high blood pressure must provide both emotional and loving support to hypertensive patients. People with hypertension need support to achieve therapeutic results and adhere to their medication regimen. Based on the results of the study Artini *et al.* (2022), which states that family support plays a very important role, especially among the elderly.

Adherence to Antihypertensive Medication at Rumah Sakit X Denpasar

Based on the results of research conducted at Rumah Sakit X Denpasar, the frequency distribution of respondents' medication compliance is as follows.

Table 4. Frequency Distribution of Adherence to Taking Medication for Hypertension Patients at Rumah Sakit X Denpasar

No.	Medication Adherence	Frequency (n=70)	Percentage (%)
1.	High	56	80,0
2.	Medium	5	7,1
3.	Low	9	12,9

Based on Table 4 above, the frequency distribution of adherence to taking medication for hypertension patients at Rumah Sakit X Denpasar can be seen that of the 70 samples who had high adherence to taking medication as many as 56 people (80%), while as many as 5 people (7.1%) had moderate adherence, and as many as 9 people (12.9%) had low adherence to adherence to taking hypertension medication. These results are consistent with research conducted by Wulandari *et al.* (2021), where 36.8% fall into the low compliance category, 12.3% fall into the moderate compliance category, and 50.7% fall into the high compliance category. Adherence to treatment is an important factor in the continued health and well-being of hypertensive patients. Adherence and compliance are prerequisites for the effectiveness of hypertension therapy and offer the greatest potential for improving hypertension control, whereas patient non-adherence to hypertension therapy is a major factor in treatment failure.

The Relationship between Knowledge and Compliance with Antihypertensive Medication at Rumah Sakit X Denpasar

Based on the results of research conducted at Rumah Sakit X Denpasar using the Spearman correlation test, the bivariate analysis is shown in Table 5.

Table 5. Relationship between Knowledge of Hypertension Patients and Adherence to Taking Hypertension Medication at Rumah Sakit X Denpasar

No.	Knowledge	Medication Adherence						Amount		r	p-value
		High		Medium		Low					
		n	%	N	%	N	%	N	%		
1.	Good	54	77,1	2	2,8	2	2,9	58	82,8	0,657	0,000
2.	Fair	2	2,9	3	4,3	7	10,0	12	17,2		
3.	Poor	0	0,0	0	0,0	0	0,0	0	0,0		
Total		56	80,0	5	7,1	9	12,9	70	100		

Based on Table 5 above shows the results of cross tabulation between the knowledge of hypertensive patients on adherence to taking antihypertensive drugs at Rumah Sakit X Denpasar obtained from 70 respondents who have good knowledge with high medication compliance as many as 54 people (77.1%), who have good knowledge with moderate medication compliance as many as 2 people (2.8%), who have good knowledge with low medication compliance as many as 2 people (2, 9%), who have sufficient knowledge with high drug compliance as many as 2 people (2.9%), who have sufficient knowledge with moderate drug compliance as many as 3 people (4.3%), who have sufficient knowledge with low drug compliance as many as 7 people (10%) and there are no patients with less knowledge with high, moderate or low drug compliance.

The results of statistical tests using the Spearman correlation test show that there is a relationship between the knowledge of hypertensive patients with adherence to taking antihypertensive drugs with a p-value of 0.000 <0.05. Based on the correlation coefficient value (r=0.657) the strength of the correlation between the two is Strong. These regularly monitoring blood pressure, can also influence patient adherence because they can see the progression of their condition.[27] Patients' understanding of the goals of hypertension therapy has a positive impact on adherence. According to research conducted by Wijaya dan Nurhasanah (2022), patients who understand the treatment goals reducing the risk of complications and improving quality of life are more committed to consistently following therapy to achieve optimal results reducing the risk of complications and improving

results are similar to those of a study conducted by Kurniawati dan Fajriannor (2023), where the results of the study showed a significant relationship between knowledge and medication adherence with a significant value of 0.000 p-value 0.000<0.05 with a correlation coefficient (r) value of 0.555. Knowledge is a factor associated with patient compliance.[26]

Research conducted by Putri *et al*. (2023), states that patients who understand hypertension tend to be more compliant with treatment because they realise the importance of controlling blood pressure. Research conducted by Prasetyo dan Wulandari (2022), states that awareness of the risks of hypertension complications is a strong motivation for taking medication regularly. Knowledge about non-pharmacological and pharmacological therapies also improves medication adherence, as Rahayu dan Santoso (2023), state that patients who understand the importance of combining healthy lifestyle changes with medication therapy are more consistent in following their treatment. Understanding therapy monitoring, such as because they can see the progression of their condition quality of life are more committed.

The Relationship between Family Support and Adherence to Antihypertensive Medication at Rumah Sakit X Denpasar

Based on the results of research conducted at Rumah Sakit X Denpasar using the Spearman correlation test, the bivariate analysis is shown in Table 6.

Table 6. The Relationship between Family Support of Hypertension Patients with Adherence to Taking Hypertension Medication at Rumah Sakit X Denpasar

No.	Family Support	Medication Adherence						Amount		r	p-value
		High		Medium		Low					
		n	%	N	%	N	%	n	%		
1.	High	55	78,6	1	1,4	7	10,0	63	90,0	0,546	0,000
2.	Low	1	1,4	4	5,7	2	2,9	7	10,0		
Total		56	80,0	5	7,1	9	12,9	70	100		

Based on Table 6 above shows the results of cross tabulation between family

support of hypertensive patients on adherence to taking antihypertensive drugs

at Rumah Sakit X Denpasar obtained from 70 respondents who had high family support with high drug compliance as many as 55 people (78.6%), who had high family support with moderate drug compliance as many as 1 person (1.4%), who have high family support with low medication adherence are 7 people (10%), who have low family support with high medication adherence are 1 person (1.4%), who have low family support with moderate medication adherence are 4 people (5.7%), and who have low family support with low medication adherence are 2 people (2.9%).

The results of statistical tests using the Spearman correlation test show that there is a relationship between family support for hypertensive patients and adherence to taking antihypertensive drugs with a p-value of 0.000 <0.05. Based on the correlation coefficient value (r=0.546) the strength of the correlation between the two is moderate.

This study is in line with research conducted by Dewi *et al*., (2022), on family support for medication adherence among elderly hypertensive patients at primary government health facilities in Denpasar, where the results showed a significant relationship between family support and medication adherence with a correlation coefficient (r) of 0.436 and a p-value of 0.000<0.05.

The family is the primary support system for hypertensive patients in maintaining their health, and plays an important role in both treatment and prevention [30]. Family support, or what is commonly known as family social support, is one of the most important factors in determining the continuity or compliance of elderly people in undergoing medical treatment. Elderly individuals who receive support in terms of emotional, informational, instrumental, and recognition aspects are more likely to adhere to medication therapy [31]. Family support is identified as one of the key determinants in improving patient adherence to hypertension treatment. Patients who receive attention and active involvement from their families tend to be more disciplined in following their treatment

regimen, have higher motivation, and are better able to overcome barriers in undergoing long-term treatment [32]. Family support for the elderly is essential to help them take their medication, as their memory declines with age [33].

CONCLUSIONS

Based on the results of the study describing the factors influencing adherence to antihypertensive medication among elderly patients at Rumah Sakit X Denpasar, it can be concluded that:

1. There is a significant association between knowledge related to hypertension and adherence to antihypertensive medication at Rumah Sakit X Denpasar, as determined using the Spearman correlation test, with a p-value of 0.000<0.05 and a correlation coefficient (r=0.657), indicating a strong correlation between the two.
2. There is a relationship between family support for hypertensive patients and adherence to antihypertensive medication at Rumah Sakit X Denpasar, as determined by the Spearman test, yielding a p-value of 0.000<0.05. Based on the correlation coefficient (r=0.546), the strength of the correlation between the two is moderate.

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