

# Medication Adherence Factors Among the Elderly With Hypertension in Nursing Homes in Indonesia

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## Abstract

**Background:** Hypertension is a common chronic disease among the Indonesian elderly. One of the biggest communities of the elderly in Indonesia was in Nursing homes, which were organized by the government or private sector. Keeping medication adherence for hypertension is the tough challenge for elderly in Nursing homes since the number of complication increase every year such as Stroke, heart disease, and kidney renal failure.

**Purpose:** This study is to identify the predictor among related factors with medication adherence of the elderly with hypertension in nursing homes

**Method:** The quantitative study recruited 152 respondents with a mean age of 63 to 64 years old. Translated Hill bone instrument was used to explore the medication adherence and demographic related factors such as age, marital status, education level, gender, type of medication, economic source, family type, and religion.

**Result:** The study revealed the significant association between economic source, age, medication, and education level as the factors predicting medication adherence.

**Conclusion:** The study suggested that health providers should be more considerate in assisting the no formal education elderly or lower education level elderly and also their attitude on medication. Collaborative care approach should facilitate the education of the elderly about hypertension, the benefits of medications, the importance of continuous medication use especially in the treatment and management of hypertension.

**Keywords:** medication adherence factors, hypertension, elderly, nursing home Indonesia

## 1. Introduction

Hypertension is the top ten most common disease suffered by the elderly in Indonesia (Kementerian Kesehatan RI, 2013). The number of elderly is growing in Indonesia and this will bring a great influence on the management of health problems (Kartini, 2020). Generally the elderly in Indonesia were living with their family, nevertheless, the elderly who didn't have family usually live in the nursing home. Several of the elderly who live in the nursing home were coming from the elderly who live alone in the street (Anwar & Masnina, 2019). The ministry of social welfare were build the facilitation in nursing homes and also recruit the caregiver or possibly an elderly nurse. However, since the burden of the nursing homes getting bigger, the health professional it is still not enough to cover the needs of caregiver which increases significantly every year (Kompas, n.d.). Then, the government made a short course for the person who wants to work for the nursing home, with a minimal education diploma in Nursing. In this way, the government expects to achieve elderly well-being in nursing homes.

The number of mortality cases by cardiovascular disease amounted to 16.7% across the Indonesian population. Patients with hypertension in Indonesia currently are estimated at 15 million, but only 4% are controlled hypertension. In the elderly population, it is estimated that more than 54% of Hypertension is not controlled. In the productive age, it is assumed to be 6-15% prevalent in general (Misnaniarti, 2017). The number of hypertensive cases increases every year and needs serious attention from the government.

A person who has entered the elderly age commonly experienced a decline in health both physically and psychologically. Along with age, there are losses of the function of the organs and other physical changes. (Wiliyanarti et al., 2020). These declines occurred at all levels of the cell, organs, and systems. This results in the increased incidence of diseases among the elderly. The vascular system is no longer elastic and the lead elements in the blood increase. Damage to blood vessels elasticity or rigidity leads to atherosclerosis (narrowing of blood vessels). Take care of hypertension in the elderly, may needs sustainable treatment. This is very important to prevent them from any complications (Ilmiah & Sandi, 2021). The level of complication risk will be reduced or prevented when there is a discipline in the treatment. It means medication adherence should be well managed.

Adherence to medication by the patient depends on the patient's behavior, that is complying with all the suggestions and guidelines recommended by health care professionals, such as physicians and nurses (Ashoorkhani et al., 2018). Now that the complication number is increasing every year among the elderly, such as stroke, cardiovascular disease, and kidney renal failure. One of the key factors to be a problem solving were keep the medication on track and complies with the treatment plan among the elderly. Compliance with taking medication from patients is expected to prevent complications (Parra et al., 2021). Generally, the level of compliance towards hypertensive treatment will increase the effectiveness of the treatment and prevent severe episodes of the disease. Certainly, its long-term impact will decrease morbidity and mortality of the patient. Anyway, it is difficult to realize this impact, because compliance is based on several factors (Brown & Bussell, 2011).

## **2. Method**

A Cross-sectional study was applied to conduct this research. The Predictors were to investigate the relationship between medication adherence and the demographic data (such as age, marital status, sex, level of education, economic factor, type of medication, family type, and religion) among elderly with hypertension in nursing homes at Yogyakarta city of Indonesian country. The instruments of this research were used translation of the hill bone scale to assess the medication adherence which was taken from several studies with a Cronbach alpha score of 0.732(Monteiro & Dennison-himmelfarb, 2016). This study was conducted at 3 public elderly nursing homes in Indonesia. This study was conducted at 3 public elderly nursing homes in Indonesia. A total of 152 hypertensive patients who met the study inclusion criteria diagnosed with hypertension with at least 3 years were recruited. The respondents fill out the questionnaire independently or with the assistance of the caregiver to fill it out and the caregiver will collect the filled questionnaire. All the questionnaires were completed within 10-20minutes.

## **3. Ethical Consideration**

The research approved ethical review by ethics committee clearance in Indonesia. This study passed approval by the Health Polytechnic of Indonesia. The researcher informed the participants about the aim of the study, potential risks and benefits, issues of confidentiality, and the researcher obtained signed consent forms from the survey.

## **4. Results**

8 independent factors tested the dependent variable. The Data shows that there are no significant differences between the group in gender with medication adherence in elderlies ( $t=0.358$ ,  $P=0.721$ ), but there was a significant difference between the age of the elderly group ( $t=7.423$ ,  $P=0.001$ ). LSD analysis indicated that the elderlies (55-74yrs ) group was greater than the old group (75-90yrs ), but didn't found a significant number with very old (>90yrs).

Table 1. Association between demographic factors with medication adherence

Variable	n	M±SD	t/F	p-value	LSD
<b>Gender</b>			<b>0.358</b>	<b>0.721</b>	
Male	<b>61</b>	64.6±1.7			
Female	<b>91</b>	63.9±10.9			
<b>Age</b>			<b>7.423</b>	<b>0.001*</b>	<b>①&gt;②</b>
① Elderly (55-74 yrs)	<b>98</b>	66.7±10.8			
② Old (75-90 yrs )	<b>51</b>	59.7±10.6			
③ Very old (>90 yrs)	<b>3</b>	58.9±9.5			
<b>Marital status</b>			<b>2.498</b>	<b>0.116</b>	
Married	<b>68</b>	66.5±10.1			
Single	<b>84</b>	62.3±11.7			
<b>Economic Source</b>			<b>-3.480</b>	<b>0.001*</b>	
Government	<b>99</b>	61.9±11.4			
Pension	<b>53</b>	68.4±9.5			
<b>Education</b>			<b>5.661</b>	<b>&lt;0.001**</b>	<b>④&gt;③&gt;②&gt;①</b>
① No formal education	<b>52</b>	60.6±9.8			
② Low educated	<b>39</b>	63.6±13.5			
③ Medium educated	<b>36</b>	65.4±10.7			
④ Highly educated	<b>25</b>	71.1±7			
<b>Family type</b>			<b>0.852</b>	<b>0.396</b>	
Nuclear family	<b>76</b>	65.6±11.1			
Others	<b>76</b>	64±11			
<b>Medication type</b>			<b>5.695</b>	<b>0.004*</b>	<b>①&gt;③&gt;②</b>
① Beta-blocker	<b>86</b>	66.7±10.6			
② ACE Inhibitor	<b>41</b>	62.1±11.8			
③ Combination	<b>25</b>	59.2±10.1			
<b>Religion</b>			<b>0.264</b>	<b>0.792</b>	
Islam	<b>93</b>	64.4±11.54			
Others	<b>59</b>	63.9±10.7			

Similarity, it had been found in the economic source, was found a significant correlation between-group ( $t=-3.480$ ,  $p=0.001$ ). There was no significant difference between adherence to medication with Marital status ( $t=0.466$ ,  $p=0.469$ ).

The result also shows that education level was significantly associated with medication adherence with  $F=5.661$  and  $p<0.001$ . This factor is the most significant number in between the 8 factors that we checked. The LSD of post hoc in ANOVA analysis, also indicates that highly educated was greater than medium educated, medium educated was greater than low educated, and low educated was greater than no formal education. That means, highly educated was the most affecting the group. In family type, that did not appear any significant difference ( $t=0.852$ ,  $p=0.396$ ).

It was interesting to see that the religion of the respondent showed no significant correlation with adherence to medication ( $t=0.264$ ,  $p=0.792$ ), but it showed in the medication type factor. There was a significant difference between medication type with  $t=5.695$  and  $p=0.004$ . LSD also indicated that was beta-blocker greater than combination and combination greater than ACE inhibitor.

Table 2. Multiple regression with stepwise method

Variable	B	SEB	p	Tolerance	VIF
1. High edu vs No formal Edu	7.012	1.815	< 0.001	1.00	1.00
1. High Edu vs No formal Edu	5.990	1.808	0.001	0.961	1.040
2. Pension vs Government	5.213	1.816	0.005	0.961	1.040
1. High edu vs No formal edu	4.812	1.826	0.005	0.905	1.105
2. Pension vs Government	5.444	1.782	0.003	0.959	1.043
3. Elderly vs Old	4.612	1.729	0.009	0.942	1.062

Note :  $R^2 = 0.234$ ;  $F(3,148) = 14.96$ ,  $p = < 0.001$

Stepwise regression analysis above, shows that Education, age, and economic status are predicting factors. Research question three was what factors seem to be adherence to medication among elderly with hypertension in Nursing homes. All assumptions of regression met, variance inflator (IVF), and tolerance of the variables were 1.00 indicating no problem of multicollinearity. In addition, the most significant values, which contribute to predicting medication adherence in the elderly with hypertension when the three variables were considered, are the education to be the first then economic source and age.

### 5. Discussion

The findings of the study revealed that age is associated with medication adherence among the elderly in nursing homes in Yogyakarta. The younger elderly group is more adhere to taking medication.

Medication adherence is the extent to which a patient's efforts and behavior in complying with instructions, rules, or medical recommendations given by a doctor or other health professional to support the patient's medication needs. Non-adherence to a therapeutic regimen may result in negative outcomes for patients and may be compounded in populations with multiple morbidities which require multiple drug therapy, such a population is exemplified by the elderly (Misnaniarti, 2017). However, non-adherence may not be more prevalent in older patients age above 75 years old possibly due to the ineffective support system such as family or their expectation of medication or health literacy. We can sum if age could be one of the predictors to capture medication adherence.

The non-adherence medication of the elderly patient possibly where to avoid adverse effects (Pan et al., 2020). Furthermore, another study found out, if the adherence lack commonality in terms of how adherence is measured, the definition of an 'older' patient, and the range of disease states which have been examined (Wiliyanarti et al., 2020). In addition to the aging process conformity declines with cognitive function, elderly have some initiative to ask for help or support in compliance with the treatment process.

The study also found a significant association between economic factors with medication adherence in the elderly with hypertension. Economic factor refers to the power to any of the considerations that involve economic variables and that are relevant to a decision. Economic factor to the elderly brings a wide view (Fitriani, 2012). The power of economics makes people have a choice. The elderly who have a choice, usually have so many considerations, especially to their health. For instance the medication and treatment, they can choose which one is the best and appropriate to them as long as they can afford it. Different from the government-subsidized group, they didn't have any choice to choose their medication. As we know most of the subsidized drugs for hypertension are a national standard, sometimes the medication that the elderly need is not included in the government-subsidized, so the health provider modified it with combination drugs, to fulfill the elderly medication needs.

Another research emphasizes that the economic factor is one of the factors that also Associated With Poor Medication Adherence In Hypertensive Patients In Lusaka, Zambia (Mweene et al., 2010). The economic factor is one of the crucial aspects of that community. The researcher mentioned if lack of transportation, high cost of transportation fee, and living at a distance of more than 10 km from the hospital are the factors that can be associated with medication adherence.

Another factor that was associated with poor adherence is a level of education. Most of the elderly's educational levels in this research were in no formal education group. Few elderly from the group with no formal education were illiterate. Educational levels were the predictor of adherence in this research and revealed that the elderly who have higher education reported higher treatment adherence.

Illiteracy is a big issue since a long time ago in Indonesia. Nowadays, it is an actual problem in the elderly who lived in nursing homes in Yogyakarta (Isdijoso et al., 2020). All the elderly illiterates were above the age equal to or above 75 years old. Formal education usually helped people to think big and rationalize things as they happened. Therefore it can be concluded that elderly who has no formal education, is highly dependent on their life experience and information sources such as poster, learning from somebody experience.

The study also found out if the hypertensive patients with higher education could insist on taking medication, implementing physical activity, and controlling Blood Pressure. It indicated that more care should be offered to patients with lower education and illiterate. The potential reason is that hypertensive patients do not comply with treatment and refuse recommendations from healthcare professionals due to the therapy will do for a lifetime (Firat Kilic et al., 2020).

The fruitfulness of medication is not only determined by the diagnosis and the selection of drug but also to carry out patient adherence in taking the drug by a prescription. The result in this research shows the association between medication adherence and the type of hypertensive drug. There are 3 kinds of medication drugs commonly use in elderly nursing homes that is, ACE inhibitors, Beta-blockers, and combination.

In LSD analysis by using ANOVA, the elderly who take Beta-blocker drugs are more adherence than combination and ACE inhibitors. The majority of the participants take a beta-blocker, few of them take combination drugs by a prescription, which is a mixture of ACE inhibitors and beta-blockers. The side effects of drugs usually appear in the elderly who take ACE inhibitors as a hypertensive treatment (Sachin Parmar, Amit Gangwal, 2011). The most important complains from the elderly was that anytime they take medication it caused side effects such as cough, dizziness, myalgia, loss the appetite, and fatigue (Ho et al., 2009). ACE inhibitor usually has more side effects than beta-blocker but depend on the dosage and also may cause of allergies in some people (Sun et al., 2016).

## 6. Conclusion

Caregivers and health providers needed to take more attention to the older elderly, elderly with low education, and paying more attention to the elderly who taking ACE inhibitors as the main medication as the main factors associated with medication adherence. The health providers need to assist the elderly possibly with make a timeline or make a schedule to remind them to take the medications.

In the future, the caregiver can play a major role in this regard and a collaborative care approach should facilitate for the younger elderly with the informative education about hypertension, benefits of medications, the importance of continuous medication use especially in the treatment and management of chronic diseases (Hypertension), and optimize health care management. Further studies are also recommended to identify another major contributory factor to non-adherence.

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