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The Influence of Feeling Lonely and Received Social Support on Medication Adherence in Elderly with Hypertension

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Abstract

Background*: Hypertension is currently a non-contagious disease that primarily affects the elderly population in Indonesia. Medication adherence is critical in managing hypertension and reducing the risk of morbidity and mortality. Previous research has found that loneliness and support received by older adults with hypertension influence medication adherence.* ***Objective****: This study aimed to examine the impact of feeling lonely and receiving social support on medication adherence in the elderly with hypertension at the Community Health Center in Surabaya.* ***Methods****: The study design of this research was a descriptive cross-sectional study from December 2021 to March 2022. A total of 235 eligible subjects fulfilled the inclusion criteria. The instruments used in the data collection were the patient's information form, UCLA-Loneliness Scale, MOS-Social Support Survey, and the ARMS (Adherence to Refill and Medication Scale).* ***Results****: The results revealed that the correlation between loneliness and social support was significantly associated with medication adherence in the elderly with hypertension ($p < 0.05$). In addition, other factors, such as occupation status, living status, comorbidity, the number of drugs taken, and antihypertensive drug therapy, showed a significant correlation with medication adherence ($p < 0,05$). The most influential factor on medication adherence was loneliness (35.5%), followed by social support (24.4%), the number of drugs taken (7.1%), antihypertensive drug therapy (monotherapy or combination therapy (2.5%), occupation status (2.4%), comorbidity (1.6%), and living status (0.2%).* ***Conclusion****: This study confirms that feeling lonely and receiving social support affect medication adherence in the elderly with hypertension at the Community Health Center in Surabaya.*

Keywords*: adherence, elderly, hypertension, loneliness, social support*

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INTRODUCTION

The ageing process induces various kinds of decline in body functions, such as physical, psychological, and social conditions (Suadirman, 2011). The decreased physical condition due to the degenerative process of ageing causes non-contagious diseases like hypertension, heart disease, Diabetes Mellitus, dental problem, etc. (Kementerian Kesehatan RI, 2019). In Indonesia, the most common degenerative disease suffered by the elderly population is hypertension (Kementerian Kesehatan RI, 2019).

Long-term drug therapy is needed to treat chronic diseases such as hypertension, even for the rest of life (Dzau & Balatbat, 2019). Hypertension can be prevented and treated with treatment adherence, whether by taking medication therapy, following a diet, or having a good lifestyle (World Health Organization, 2003). Adherence to antihypertensive medication therapy should be done regularly and continuously with the result that the 'patient's blood pressure can be well controlled (World Health Organization, 2019). The therapeutic goal of medication adherence is to prevent and reduce the likelihood of morbidity and mortality in elderly patients (Corrao *et al*., 2017).

Several factors influence adherence to taking medication in the elderly with hypertension, one of which is demographic factors such as age, gender, level of education, economic status, marital status, living status, and occupation status (Gast & Mathes, 2019; Hazwan & Pinatih, 2017; Liberty *et al*., 2018; Sinuraya *et al*., 2018; Uchmanowicz *et al*., 2018). Psychosocial factors influencing medication adherence in the elderly include loneliness and social support *(Hacihasanoglu et al*., 2020; Lu *et al*., 2020). A study conducted on 1,233 elderly in Indonesia aged ≥ 60 years showed that one in five elderly lives alone, and half experience loneliness (Widhowati *et al*., 2020).

Loneliness can be caused by the lack of interpersonal relationships due to disconnection or social contact with family, friends, or partners. Those can lead a person to be unable to feel social support (Donovan & Blazer, 2020). Sufficient support has a crucial role in the treatment of hypertension, especially support from family, healthcare providers, friends, and others such as peer groups (Shahin *et al*., 2021). Elderly hypertensive patients who live with their families have better adherence than those who e live alone or in a nursing home (Uchmanowicz *et al*., 2018).

Previous research has helped us understand how loneliness and social support affect medication adherence. However, research on the impact of loneliness and social support on medication adherence in the elderly with hypertension is still limited. This study aims to see if feeling lonely and receiving social support affects medication adherence.

MATERIALS AND METHODS

Materials

This study was acquitted on the elderly with hypertension at the Community Health Centers in Surabaya. The Community Health Centers are Puskesmas Gading, Puskesmas Rangkah, and Puskesmas Mojo. The criteria for inclusion must be met: elderly aged 60 – 79 years diagnosed with hypertension and have started antihypertensive medication therapy for at least three months or more, can communicate well, can read and complete self-administered questionnaires. The exclusion criteria were: elderly hypertensive patients who also had dementia, schizophrenia, tuberculosis, tested positive for covid-19, or had physical disorders such as eye, hand movement, and hearing loss.

Tools

Patient information form, University of California Los Angeles (UCLA)-Loneliness Scale, and Medical Outcome Study-Social Support Survey (MOS-SSS) were used to collect data. Patient information forms include demographic and clinical data. The UCLA-Loneliness Scale (Version 3) was used to measure 'one's subjective feelings of loneliness (Russell, 1996). The Medical Outcome Study-Social Support Survey (MOS-SSS) determined the availability of support which was created to assess perceived social support for patients with chronic conditions (Sherbourne & Stewart, 1991). The ARMS (Adherence to Refill and Medication Scale) measured a patient's adherence to antihypertensive medication therapy (Kripalani *et al*., 2009). The ARMS was translated and validated into Indonesian by a previous study (Mubasir *et al*., 2017). The authors have obtained permission from the creators of the instruments in this study. In this study, the original English version of the UCLA-Loneliness Scale and MOS-Social Support Survey was translated and adapted into Indonesian by native Indonesian speakers who were fluent in English, using forward and backward translations according to Basic Guidelines for Translating Survey Research and Development (RAND) (RAND, 2021). The procedure is as follows: (1) forward translation, the English version of the UCLA-Loneliness Scale and MOS-Social Support Survey were translated into Indonesian by a professional translator from the Pusat Bahasa (Language Center) of

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Universitas Airlangga, (2) review, identifying the differences in items, terms, and concepts and the completion by the expert panel, (3) back-translation, the reviewed Indonesian version of the UCLA-Loneliness Scale and MOS-Social Support Survey were translated back into original English by another professional translator from the Pusat Bahasa (Language Center) of Universitas Airlangga, (4) accomplish discrepancies or problems in the translation by a committee that includes the forward translator, backward translator, and reviewer. The Indonesian version of the UCLA-Loneliness Scale and MOS-Social Support Survey were pre-tested on 70 elderly with hypertension with the same inclusion criteria in this study. Data were analyzed, and the results showed that the Corrected Item-Total Correlation for all items were greater than the r value (r UCLA-Loneliness Scale = 0.2992; r MOS-Social Support Survey = 0.3007) and the ' 'Cronbach's alpha was above 0.7 (UCLA-Loneliness Scale = 0.882; MOS-Social Support Survey = 0.937), which indicates high internal consistency. The Indonesian version of the UCLA-Loneliness Scale and MOS-Social Support Survey is valid and reliable for measuring loneliness and support in elderly patients with hypertension.

Method

Study design

This study used a descriptive cross-sectional study from December 2021 and March 2022. The research began with the recruitment of respondents. First, the researcher explained the objectives and benefits of the study to each respondent; then, the respondent was asked to sign an informed consent if they were willing to participate in the study. Second, the respondent filled out the self-administered questionnaire.

Researchers met 368 elderly patients with hypertension during the research. A total of 133 patients were excluded because of not willing to participate (n = 21), being illiterate (n = 21), did not bring glasses, so they did not read (n = 19), having physical impairment (n = 44), resigned at the time of filling out the self-administered questionnaire (n = 3), and tested for positive Covid-19 (n = 9). About 235 elderly with hypertension fulfilled the inclusion criteria and completed the self-administered questionnaire. The respondents were recruited from 3 Community Health Centers in Surabaya (Puskesmas Gading, Puskesmas Rangkah, and Puskesmas Mojo). Community health centers were chosen because they are included in the five largest health centres with the highest estimated number of hypertension patients in Surabaya (Dinas Kesehatan Kota Surabaya, 2019).

Sample size

The Lemeshow formula was used to calculate sample size at a confidence level of 95%, an error tolerance of 5%, and the estimated population proportion as the most significant proportion of data (50%). Based on the formula, it was obtained that the sample size was 235.

The ARMS (Adherence to Refills and Medication Scale)

The ARMS is a valid and reliable medication adherence scale when used in 'patients with chronic disease, with good performance characteristics, and even in patients with low literacy skills (Kripalani *et al*., 2009). This questionnaire consists of 12 question items, 8 are sub-scales for medication adherence and 4 are sub-scales for drug refill adherence. Each item was rated using a Likert scale, ranging from 1 (none of the time) to 4 (all of the time). Especially for the last question, the scale is reversed from 1 (for all of the time) to 4 (none of the time) (Kripalani *et al*., 2009). The overall adherence score may range from 12 to 48, with lower scores indicating better adherence (Kripalani *et al*., 2009).

The UCLA-loneliness scale (version 3)

The UCLA-Loneliness Scale (Version 3) is the latest version of the UCLA-Loneliness Scale developed by Russell (1996). This is a 20-item scale that has attempted to simplify the response format and the wording of the item. The scale has been used in studies of various populations, including the elderly (Russell, 1996). Each item has been rated using the Likert scale from 1 (never) to 4 (always), 11 negative words (lonely) encoded directly and nine positively (non-lonely)inverted. Higher scores indicate a higher degree of loneliness (Russell, 1996).

The MOS-social support survey

The MOS-Social Support Survey is a 19-item multidimensional instrument for patients with chronic conditions in the Medical Outcomes Study developed by Sherbourne & Stewart (1991). This questionnaire measures the availability of support in various dimensions of social support, not only the sources of social support but also overall perceived support, including emotional/informational support, tangible support, affectionate support, and positive social interaction (Sherbourne & Stewart, 1991). Each item was rated using a Likert scale from 1 (none of the time) to 5 (all of the time). A higher score indicates more support than perceived by ' 'participants (Sherbourne & Stewart, 1991).

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Statistical analysis

The data were presented in the Statistical Package for the Social Sciences (SPSS) version 24.0. Statistical analyses used descriptive analysis to have the distribution of frequency of demographic and clinical characteristics. The normality of the distribution of loneliness, social support, and adherence variables was examined using the Kolmogorov-Smirnov test. The test results showed that the data were not normally distributed, so the differences in the proportion of adherence between two groups based on demographic and clinical factors examine by using the Mann-Whitney test and between three groups or more using Kruskal-Wallis. The 'Spearman's rank correlation coefficient was used to acquire the correlation between loneliness, social support, and adherence. Linear regression was used as a multivariate analysis to determine how much influence each variable has on adherence. The results are statistically significant with P-value (< 0,05).

Ethics consideration

The Human Research Ethics Committee Faculty of Nursing Universitas Airlangga has approved this study (No.: 2392-KEPK).

RESULTS AND DISCUSSION

The comparison between demographic and clinical characteristics to adherence scores

The detailed demographic and clinical characteristics of the patients are shown in Table 1. In this study, most participants were aged 60 - 79 years (74%) with the mean (SD) was 65.8 ± 8.3, female (61%), married (64%), living with family (81%), primary school graduate (36%), not working (77%), the income per month less than Rp 1,500,000.00 (88%), the duration of hypertension 1 to 5 years (51%) with a mean (SD) was (59.3 ± 67.3) (months), the number of drugs taken is one pill a day (38%), not have comorbidity (39%), and having monotherapy antihypertensive drug (84%). The results in Table 2 showed that age, gender, marital status, level of education, and the duration of hypertension showed no significant difference in adherence to antihypertensive ($p > 0.05$). Table 2 presents the mean rank of adherence level for each group. The group with a lower mean rank score indicates better adherence. However, occupation status, living status, comorbidity, antihypertensive medication, and the number of drugs taken significantly differed with adherence to hypertension medication ($p < 0.05$).

Although there are still differences between previous studies, which indicated that demographic and duration of hypertension are significantly associated with medication adherence (Agung *et al*., 2021; Gast & Mathes, 2019; Liberty *et al*., 2018; Sinuraya *et al*., 2018; Wan *et al*., 2022), there are other having similar findings to our study. The studies in Thailand, China and Korea exhibit that age, gender, marital status, education level, occupation status, the number of drugs taken, and the duration of hypertension were not statistically significant to medication adherence in the elderly with hypertension (Cho *et al*., 2018; Wan *et al*., 2022; Woodham *et al*., 2018). A meta-analysis study in the Asian region revealed that gender and education level were not associated with medication adherence in patients with hypertension (Akbar *et al*., 2021).

In this study, the first factor related to medication adherence in elderly hypertensive patients was occupation and living status. Previous research conducted in China and Indonesia (Bandung, Magelang, and Semarang) showed that occupation status had a statistically significant effect on medication adherence in adult to elderly hypertensive patients (Agung *et al*., 2021; Nurhanani *et al*., 2020; Pan *et al*., 2019; Sinuraya *et al*., 2018). Patients who are not working or retired tend to adhere less to the treatment of hypertension *(Pan et al*., 2021; Woodham *et al*., 2018). Living status in this study included living alone, with a spouse, or with family. Another study in China showed that elderly hypertensive patients with hypertension who lived with spouses and offspring had a much higher level of medication adherence than those who lived alone (Wan *et al*., 2022). Elderly hypertensive patients who live with others and have social interactions are more motivated to adhere to antihypertensive medication therapy *(Lu et al*., 2020).

Several studies revealed a significant association between the number of drugs taken and medication adherence in elderly hypertensive patients (Shareinia et al., 2020), and patients with more complicated prescriptions had better medication adherence (Thuy et al., 2020). In this study, clinical factors related to medication adherence were comorbidities, antihypertensive medication therapy, and the total number of daily drugs taken. Similar results were obtained from the studies in Romania and Korea on elderly hypertensive patients. Comorbidities such as diabetes mellitus, heart disease, kidney disease, dyslipidemia, cancer, and stroke had high medication adherence (Cho *et al*., 2018; Tilea et al., 2018). A study in Wuhu, China, conducted antihypertensive medication therapy (single or combination), and the total number of drugs taken did not affect antihypertensive medication adherence (Wan *et al*., 2022). In this study, however, the

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opposite results were obtained; elderly hypertensive patients who received antihypertensive monotherapy demonstrated better adherence (Uchmanowicz *et al*., 2018). Another study found that the number of antihypertensive drugs taken was related to medication adherence; when the number of medicines taken increased, a person had better medication adherence (Pan *et al*., 2021).

Table 1. Demographic and clinical characteristics (N=235)

Variable	Category	N (%)
Age (years), mean ± SD (65.8 ± 8.3)	60 - 69	173 (74%)
	70 - 79	62 (26%)
Gender	Female	144 (61%)
	Male	91 (39%)
Marital status	Not married	2 (1%)
	Married	150 (64%)
	Divorced and not remarried	8 (3%)
	Widowed and not remarried	75 (32%)
Living status	Living alone	13 (5%)
	With spouse	32 (14%)
	With family	190 (81%)
Education	None	54 (23%)
	Primary school	84 (36%)
	Secondary school	40 (17%)
	High school	47 (20%)
	Vocational	2 (1%)
	Bachelor	8 (3%)
Occupation status	Working	54 (23%)
	Not working	181 (77%)
Income per month	< Rp 1,500,000.00	207 (88%)
	Rp 1,500,000,00 – Rp 2,500,000.00	16 (7%)
	Rp 2,500,000,00 - Rp 5,000,000.00	11 (5%)
	> Rp 5,000,000.00	1 (0%)
Duration of hypertension (in years), mean ± SD (59.3 ± 67.3) (in months)	< 1	61 (26%)
	1 – 5	120 (51%)
	6 – 10	31 (13%)
	11 – 15	6 (3%)
	16 – 20	13 (6%)
	> 20	4 (2%)
The number of drugs taken	1	89 (38%)
	2	40 (17%)
	3	68 (29%)
	4	28 (12%)
	5	8 (3%)
	> 5	2 (1%)
Comorbidities	None	92 (39%)
	Diabetes Mellitus	84 (36%)
	Heart disease	10 (4%)
	Hypercholesterolemia	6 (3%)
	Gastritis	4 (2%)
	Vertigo	4 (2%)
	Others	35 (15%)
Antihypertensive drug therapy	Monotherapy	197 (84%)
	Combination of 2 drugs	37 (16%)
	Combination of 3 drugs	1 (0%)

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Table 2. Medication adherence based on demographic and clinical characteristics

Variable	Category	Medication Adherence	
		Mean rank	**P-value**
Age (years)[a]	60 - 69	119.34	0.610
	70 - 79	114.27	
Gender[a]	Female	116.39	0.643
	Male	120.55	
Marital status	Not married	127.00	0.523
	Married	113.31	
	Divorced and not remarried	116.69	
	Widowed and not remarried	127.46	
Living status	Living alone	164.19	0.007*
	With spouse	94.66	
	With family	118.77	
Level of Education	None	121.07	0.461
	Primary school	109.58	
	Secondary school	111.56	
	High school	132.97	
	Vocational	151.75	
	Bachelor	120.06	
Occupation status	Working	137.67	0.014*
	Not working	112.13	
Income per month	< Rp 1,500,000.00	114.20	0.087
	Rp 1,500,000,00 – Rp 2,500,000.00	136.97	
	Rp 2,500,000,00 – Rp 5,000,000.00	161.55	
	> Rp5,000,000.00	122.50	
Duration of hypertension (years)[b]	< 1	128.76	0.739
	1 – 5	112.67	
	6 – 10	121.58	
	11 – 15	115.83	
	16 – 20	115.62	
	> 20	99.38	
The number of drugs taken	1	132.28	0.001*
	2	136.38	
	3	106.16	
	4	96.32	
	5	65.81	
	> 5	30.00	
Comorbidities	None	132.87	0.000*
	Diabetes Mellitus	113.36	
	Heart disease	57.18	
	Hypercholesterolemia	128.20	
	Gastritis	186.25	
	Vertigo	148.30	
	Others	99.03	
Antihypertensive drug therapy	Monotherapy	123.44	0.015*
	Combination of 2 drugs	93.04	
	Combination of 3 drugs	30.00	

*statistically significant (P < 0.05)

[a] using the Mann-Whitney test

[b] using the Kruskal-Wallis test

[c] the group with a lower mean rank score indicates better adherence

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The relationship between loneliness and social support with adherence

The total score of the UCLA-Loneliness Scale questionnaire indicates that the lower the score obtained, the lower the perceived loneliness, and the lower ARMS-adherence score indicates that the adherence is lower, so the two scores from the two questionnaires are in line (positive correlation coefficient). There was a positive correlation coefficient value (0.618) in Table 3, which means that the two variables have a positive direction. There was a significant association between loneliness and medication adherence in this study. In our study, medication adherence is improved when loneliness is less of a concern. In addition, people who experience loneliness, especially the elderly, tend to be more at risk of hypertension, cardiovascular disease, and respiratory disease (Golaszewski *et al*., 2022).

Table 3. The connection between loneliness and social support with medication adherence

Variable	Medication Adherence	
	Correlation Coefficient	Sig.
Loneliness	0.618**	0.000
Social support	-0.558**	0.000

**statistically significant (< 0,01)

The higher score of the MOS-Social Support Survey indicates the higher support received, while the lower ARMS-adherence score indicates that the adherence is getting better, so the two scores are opposite or inverted (negative correlation coefficient). Social support has a negative correlation coefficient value (-0.558) in Table 3., it means that the more support the elderly felt, the better medication adherence. This study's findings are similar to the current study that investigated the association between loneliness and medication adherence; loneliness is statistically significantly related to medication adherence; the lower perceived loneliness, the better medication adherence (Hacihasanoglu *et al*., 2020; Jankowska-Polańska *et al*., 2020; Lu *et al*., 2020).

Social support can be defined as support from anyone, including family, friends, neighbours, and health care providers, containing emotional or informational support, tangible support, affectionate support, and positive social interaction (Sherbourne & Stewart, 1991). The results of this study revealed that social support is significantly related to medication adherence. A systematic review study explained that social support was significantly associated with medication adherence in hypertensive patients (Shahin *et al*., 2021). The existence of adequate social support from the social environment around the patient can improve medication adherence (Shahin *et al*., 2021). Low social support can lead to suboptimal medication adherence in elderly hypertensive patients with or without comorbidities (Lu *et al*., 2020). Another study on adult and elderly hypertensive patients showed that the more significant support received, the better adherence to medication (Gast & Mathes, 2019; Pan *et al*., 2021; Turan *et al*., 2019). Practical support such as medical assistance (reminders to take medication, direct instructions for drug use, and prescription) and financial support lead to better medication adherence (Adisa *et al*., 2017; Ashoorkhani *et al*., 2018; Jung & Lee, 2017; Yazdanpanah *et al*., 2019). A study that provides social support through SMS intervention (medication reminders, diet, and control schedules) can improve medication adherence and control blood pressure in patients with hypertension (Nursalam et al., 2020).

The impact of demographic, clinical, loneliness, and social support on medication adherence

This study evaluated the factors influencing medication adherence in the elderly with hypertension. The results of the linear regression test revealed the R square value on medication adherence in Table 4. The most influential factor on medication adherence based on R square values is loneliness (35.5%), followed by social support (24.4%), the number of drugs taken (7.1%), antihypertensive drug therapy (2.5%), occupation status (2.4%), comorbidity (1.6%), and living status (0.2%).

This study is inseparable from limitations; there are three limitations. First, this study only reached patients who could communicate well and read, so it did not reach patients who could not speak well and were illiterate. Second, this study excluded patients who could read but had limited physical impairment such as hearing loss, body movement disorders (history of stroke in hand; unable to hold a pen), and vision impairment (not carrying glasses, low vision, blurred eyes, cataract, glaucoma, etc.) so that patient cannot read the letters. Third, this research was conducted in the urban area; it did not reach rural or remote areas. In the future, further research is needed to find a design that can be applied to all conditions of elderly hypertensive patients.

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Table 4. The connection between Loneliness and Social Support with medication adherence

Variable	Medication adherence		
	R	R square	P value
Loneliness	0.596	0355	0.000*
Social support	0.494	0.244	0.000*
Living status	0.040	0.002	0.545*
Occupation status	0.155	0.024	0.018*
Comorbidity	0.126	0.016	0.053*
Antihypertensive drug therapy	0.157	0.025	0.000*
The number of drugs taken	0.266	0.071	0.000*

*statistically significant (< 0.05)

CONCLUSION

Adherence to medication therapy may significantly impact treatment goals in the elderly with hypertension. Feelings of loneliness and lack of received social support may decrease medication adherence in the elderly with hypertension. In the future, strategies such as appropriate treatment or intervention are needed to overcome loneliness and increase social support to increase medication adherence among elderly patients.

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AUTHOR CONTRIBUTIONS

Conceptualization, D. N. S., W. U., E. Z.; Methodology, D. N. S., W. U., E. Z.; Software, D. N. S.; Validation, W. U., E. Z.; Formal Analysis, D. N. S., E. Z.; Investigation, D. N. S.; Resources, D. N. S., E. Z.; Data Curation, D. N. S., E. Z.; Writing - Original Draft, D. N. S., W. U., E. Z.; Writing - Review & Editing, D. N. S., W. U., E. Z.; Visualization, D. N. S., E. Z.; Supervision, E. Z.; Project Administration, D. N. S., W. U., E. Z.; Funding acquisition, E. Z.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

REFERENCES

Adisa, R., Olamide, O. & Fakeye, T. (2017). Social Support, Treatment Adherence and Outcome among Hypertensive and Type 2 Diabetes Patients in Ambulatory Care Settings in Southwestern Nigeria. *Ghana Medical Journal*; *51*; 64–77.

Agung, W. T., Nugraheni, A., Wahyudi, F. & Ardhianto, P. (2021). Factors Associated with Medication Adherence in Hypertension in The Ngluwar Public Health Center in Magelang Regency. *Diponegoro Medical Journal*; *10*; 426-432.

Akbar, I., Isa, M., Arifin, S., Barlian & Husaini. (2021). Meta-Analysis: Relationship of Age, Gender, and Education Level with Medication Adherence of Hypertension Patients. *The International Journal of Travel Medicine and Global Health*; *7*; 20–24. doi: 10.20469/ijhms.7.3004.

Ashoorkhani, M., Majdzadeh, R., Gholami, J., Eftekhar, H. & Bozorgi, A. (2018). Understanding Non-Adherence to Treatment in Hypertension: A Qualitative Study. *International Journal of Community Based Nursing and Midwifery*; *6*; 314–323.

Cho, M. H., Shin, D. W., Chang, S. -A., Lee, J. E., Jeong, S. -M., Kim, S. H., Yun, J. M. & Son, K. (2018). Association between Cognitive Impairment and Poor Antihypertensive Medication Adherence in Elderly Hypertensive Patients Without Dementia. *Scientific Reports*; *8*; 1-7. doi: 10.1038/s41598-018-29974-7.

Corrao, G., Rea, F., Monzio Compagnoni, M., Merlino, L. & Mancia, G. (2017). Protective Effects of Antihypertensive Treatment in Patients Aged 85 Years or Older. *Journal of Hypertension*; *35*; 1432-1441. doi: 10.1097/HJH.0000000000001323.

Dinas Kesehatan Kota Surabaya. (2019). Profil Kesehatan Kota Surabaya Tahun 2019. Surabaya: Dinas Kesehatan Kota Surabaya.

Donovan, N. J. & Blazer, D. (2020). Social Isolation and Loneliness in Older Adults: Review and Commentary of a National Academies Report. *The American Journal of Geriatric Psychiatry*; *28*; 1233–1244. doi: 10.1016/j.jagp.2020.08.005.

Dzau, V. J. & Balatbat, C. A. (2019). Future of Hypertension. *Hypertension (Dallas, Tex. : 1979)*;

74; 450–457. doi: 10.1161/HYPERTENSIONAHA.119.13437.

Gast, A., & Mathes, T. (2019). Medication Adherence Influencing Factors—an (updated) Overview of Systematic Reviews. *Systematic Reviews*; *8*; 1-17. doi: 10.1186/s13643-019-1014-8.

Golaszewski, N. M., LaCroix, A. Z., Godino, J. G., Allison, M. A., Manson, J. E., King, J. J., Weitlauf, J. C., Bea, J. W., Garcia, L., Kroenke, C. H., Saquib, N., Cannell, B., Nguyen, S. & Bellettiere, J. (2022). Evaluation of Social Isolation, Loneliness, and Cardiovascular Disease Among Older Women in the US. *JAMA Network Open*; *5*; e2146461–e2146461. doi: 10.1001/jamanetworkopen.2021.46461.

Hacihasanoglu, A. R., Yildirim, A., Saglam, R., Demirturk Selcuk, E., Erduran, Y. & Sarihan, O. (2020). The Effect of Loneliness and Perceived Social Support on Medication Adherence Self-Efficacy in Hypertensive Patients: An Example of Turkey. *Journal of Vascular Nursing*; *38*; 183-190. https://doi.org/10.1016/j.jvn.2020.07.003.

Hazwan, A. & Pinatih, G. N. I. (2017). Gambaran Karakteristik Penderita Hipertensi dan Tingkat Kepatuhan Minum Obat di Wilayah Kerja Puskesmas Kintamani I. *Intisari Sains Medis*; *8*; 130–134. doi: 10.1556/ism.v8i2.127.

Jankowska-Polańska, B., Świątoniowska-Lonc, N., Sławuta, A., Krówczyńska, D., Dudek, K. & Mazur, G. (2020). Patient-Reported Compliance in Older Age Patients with Chronic Heart Failure. *PLOS ONE*; *15*; 1-16. doi: 10.1371/journal.pone.0231076.

Jung, H. & Lee, J. -E. (2017). The Impact of Community-Based eHealth Self-Management Intervention among Elderly Living Alone with Hypertension. *Journal of Telemedicine and Telecare*; *23*; 167–173. doi: 10.1177/1357633X15621467.

Kementerian Kesehatan RI. (2019). Laporan Nasional RISKESDAS 2018. Jakarta: Kementerian Kesehatan RI.

Kripalani, S., Risser, J., Gatti, M. E. & Jacobson, T. A. (2009). Development and Evaluation of the Adherence to Refills and Medications Scale (ARMS) Among Low-Literacy Patients with Chronic Disease. *Value in Health: The Journal of the International Society for Pharmacoeconomics and Outcomes Research*; *12*; 118–123. doi: 10.1111/j.1524-4733.2008.00400.x.

Liberty, I. A., Pariyana, P., Roflin, E., & Waris, L. (2018). Determinan Kepatuhan Berobat Pasien Hipertensi pada Fasilitas Kesehatan Tingkat I. *Jurnal Penelitian Dan Pengembangan Pelayanan Kesehatan*; *1*; 58–65. doi: 10.22435/jpppk.v1i1.428.

Lu, J., Zhang, N., Mao, D., Wang, Y. & Wang, X. (2020). How Social Isolation and Loneliness Effect Medication Adherence among Elderly with Chronic Diseases: An Integrated Theory and Validated Cross-Sectional Study. *Archives of Gerontology and Geriatrics*; *90*; 1-7. doi: 10.1016/j.archger.2020.104154.

Mubasir, M., Setiawan, C. D., Wathaniah, N., Rahmaniah, A., Maharani, P., Mahmudah, A. & Achmad, G. N. V. (2017). The Influence of Medication 'Days' Supply on Adherence and Cost of Hypertensive Patients at Primary Health Care Centre. *Indonesian Journal of Pharmacy*; *28*; 213 – 220. doi: 10.14499/indonesianjpharm28iss4pp213.

Nurhanani, R., Susanto, H. S. & Udiyono, A. (2020). Hubungan Faktor Pengetahuan dengan Tingkat Kepatuhan Minum Obat Antihipertensi (Studi Pada Pasien Hipertensi Essential di Wilayah Kerja Puskesmas Bandarharjo Kota Semarang). *Jurnal Kesehatan Masyarakat*; *8*; 114–121.

Nursalam, N., Dewi, L. C., & Widhiastuti, E. (2020). The Effect of Social Support Based on Short Message Service (Sms) on Compliance in Treatment and Reduction of Blood Pressure in Hypertension Patients in Betun Puskesmas and Besikama Puskesmas. *Critical Medical and Surgical Nursing Journal (CMSNJ)*; *9*; 10–16. doi: 10.20473/cmsnj.v9i1.17802.

Pan, J., Hu, B., Wu, L. & Li, Y. (2021). The Effect of Social Support on Treatment Adherence in Hypertension in China. *Patient Preference and Adherence*; *15*; 1953–1961. doi: 10.2147/PPA.S325793.

Pan, J., Wu, L., Wang, H., Lei, T., Hu, B., Xue, X. & Li, Q. (2019). Determinants of Hypertension Treatment Adherence Among a Chinese Population using the Therapeutic Adherence Scale for Hypertensive Patients. *Medicine*; *98*; 1-7. doi: 10.1097/MD.0000000000016116.

RAND. (2021). Basic Guidelines for Translating Surveys. California: RAND.

Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor

Structure. *Journal of Personality Assessment*; *66*; 20–40. doi: 10.1207/s15327752jpa6601_2.

Shahin, W., Kennedy, G. A. & Stupans, I. (2021). The Association Between Social Support and Medication Adherence in Patients with Hypertension: A Systematic Review. *Pharmacy Practice*; *19*; 1-8. doi: 10.18549/PharmPract.2021.2.2300.

Sherbourne, C. D. & Stewart, A. L. (1991). The MOS Social Support Survey. *Social Science & Medicine*; *32*; 705–714. doi: 10.1016/0277-9536(91)90150-b.

Sinuraya, R., Destiani, D., Puspitasari, I. M. & Diantini, A. (2018). Medication Adherence among Hypertensive Patients in Primary Healthcare in Bandung City. *Indonesian Journal of Clinical Pharmacy*; *7*; 124–133. doi: 10.15416/ijcp.2018.7.2.124.

Suadirman, S. P. (2011). Psikologi Usia Lanjut. Yogyakarta: Gadjah Mada University Press.

Turan, G. B., Aksoy, M. & Çiftçi, B. (2019). Effect of Social Support on the Treatment Adherence of Hypertension Patients. *Journal of Vascular Nursing*; *37*; 46–51. doi: 10.1016/j.jvn.2018.10.005

Uchmanowicz, B., Chudiak, A., Uchmanowicz, I., Rosińczuk, J. & Froelicher, E. S. (2018). Factors Influencing Adherence to Treatment in Older Adults with Hypertension. *Clinical Interventions in Aging*; *13*; 2425–2441. doi: 10.2147/CIA.S182881.

Wan, J., Wu, Y., Ma, Y., Tao, X. & Wang, A. (2022). Predictors of Poor Medication Adherence of Older People with Hypertension. *Nursing Open*; *9*; 1370-1378. doi: 10.1002/nop2.1183.

Widhowati, S. S., Chen, C. -M., Chang, L. -H., Lee, C. -K. & Fetzer, S. (2020). Living Alone, Loneliness, and Depressive Symptoms among Indonesian Older Women. *Health Care for Women International*; *41*; 984-996. doi: 10.1080/07399332.2020.1797039.

Woodham, N., Taneepanichskul, S., Somrongthong, R., & Auamkul, N. (2018). Medication Adherence and Associated Factors among Elderly Hypertension Patients with Uncontrolled Blood Pressure in Rural Area, Northeast Thailand. *Journal of Health Research*; *32*; 449–458. doi: 10.1108/JHR-11-2018-085.

World Health Organization. (2003). Adherence to Long-Term Therapies: Evidence for Action. Geneva: World Health Organization.

World Health Organization. (2019). Hypertension by WHO. https://www.who.int/news-room/fact-sheets/detail/hypertension. Accessed: 13 September 201.

Yazdanpanah, Y., SalehMoghaddam, A., Mazloum, S., Hajialibeigloo, R. & Mohajer, S. (2019). Effect of an Educational Program based on Health Belief Model on Medication Adherence in Elderly Patients with Hypertension. *Evidence Based Care Journal*; *9*; 52-62. doi: 10.22038/EBCJ.2019.35215.1895.