Blood Pressure, Stress Level, and Age with Sleep Quality in Elderly

Nety Mawarda Hatmanti[1], Yurike Septianingrum[2], Erika Martining Wardani[3], Rusdianingseh[4], Alimatus Sa'diyah[5]

[1,2,3,4] Lecturer at Bachelor of Nursing, Nursing and Midwifery Faculty, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia
[5] Student at Bachelor of Nursing, Nursing and Midwifery Faculty, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia

A B S T R A C T

The ageing process in the elderly will cause several changes in the life cycle, one of which is in terms of sleep needs. Elderly sleep needs include sleep quality and quantity. The causes of both disorders are not only due to ageing factors but can also be caused by physical illness and psychological conditions of the elderly. Analyzing the relationship of blood pressure, stress level and age with sleep quality in the elderly. Using descriptive analytics with cross sectional methods. The population was 46 elderly, with simple random sampling technique obtained a sample of 42 elderly. Independent variables are blood pressure, stress level and age. The dependent variable is sleep quality. Blood pressure was associated with sleep quality (ρ =0.003), stress level was associated with sleep quality (ρ =0.008) and there was no association between age and sleep quality (ρ =0.936). The elderly need attention and support from people around them to carry out management in controlling blood pressure, stress levels and fulfillment of daily needs.

INTRODUCTION

The aging process experienced by the elderly is one of the etiologies of the event and can increase the severity of insomnia. The elderly experience changes in the structure, duration, depth, and continuity of sleep from previous conditions. The elderly experience shorter sleep times, lighter and frequent awakenings. Physiologically, the elderly enter sleep phases 1 and 2 and less into phases 3 and 4 sleep. Older people have less average sleep duration compared to young adults. (Akbar Harisa, Syahrul Syahrul, Yodang Yodang , Restu Abady, 2022)

Indonesia is one of the countries facing an increasing trend in the number of older adults. Badan Pusat Statistic released data on the number of elderly people based on the results of the 2016 Inter-Census Population Survey, estimating that the number of elderly people (aged 60 years and over) in Indonesia was 22,630,882 people. This figure is expected to increase to 31,320,066 by 2022. (Infodatin, 2022)

Sleep is an important anabolic process of cell and tissue regeneration and plays an important role in maintaining the dynamic balance between synapses and lymphatic metabolic clearance of the brain, thus contributing greatly to physical and mental health (Ji, Wang, Wang, & Liao, 2022). One of the common problems in aging is sleep disturbances that affect the quality of life of the elderly. Sleep is considered a basic human need and is included in one of Maslow's needs in terms of physiological needs in terms of allowing the human body to re-energize and relieve tension. Research shows that aging is associated with

decreased sleep quality and quantity as age-related changes lead to lighter sleep and decreased sleep efficiency. The most common sleep complaints experienced by older people include difficulty falling asleep, waking up at night, waking up too early and being sleepy throughout the day. The number of hours of sleep will decrease with age. In older adults, the delta phase (deep sleep stage) is reduced in duration, as they only spend about 10% of this stage (Habibollahpour, Ranjkesh, Motalebi, & Mohammadi, 2019). Several studies have shown that older people report poor sleep quality, with insomnia being the most common sleep disorder (Amicucci, Salfi, D'atri, Viselli, & Ferrara, 2021). The results showed that the level of depression had a significant effect on insomnia in the elderly. When the elderly experience a physical decline, the elderly will find it difficult to start sleeping and even insomnia occurs (Hatmanti & Muzdalifah, 2019). Another study also showed that there was a relationship between emotional stress levels and the quality of sleep of the elderly at the Cepiring elderly social service center, Kendal Regency. (Dahroni, Arisdiani, & Widiastuti, 2019).

METHOD

This research design uses a descriptive analytic design with a cross sectional approach. The population in this study were elderly people in RW.10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya, totaling 46 elderly people. Using probability sampling technique with simple random sampling technique, a sample of 42 elderly people was found. The inclusion criteria in this study were elderly people with compos mentis and healthy consciousness. Exclusion criteria in this study are elderly with dementia and decreased hearing. Data collection techniques for blood pressure variables use observation of blood pressure checks with a manual sphygmomanometer. The variable level of stress in the elderly was measured by the Perceived Stress Scale (PSS) questionnaire which consisted of 10 questions. Sleep quality variables were measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which consisted of 9 questions. Data analysis technique to know the relationship between variables using the SPSS Chi-Square test. Meanwhile, to find out which variables are most related, a binary logistic regression test is used.

RESULT

The results of the study are outlined in the table below:

Nety Mawarda Hatmanti - Blood Pressure, Stress Level, and Age with Sleep Quality in Elderly

Table 1 Frequency distribution of respondents (n = 42)

Gender	f	%
Men	2	4,8
Women	40	95,2
Age		
45-59 year	0	0
60-74 year	33	78,6
75-90 year	9	21,4
>90 year	0	0
Blood pressure		
Normal	12	28,6
Prehypertension	9	21,4
Hypertension grade 1	14	33,3
Hypertension grade 2	7	16,7
Stress level		
Mild	9	21,4
Moderate	32	76,2
Heavy	1	2,4
Sleep quality		
Good	5	11,9
Poor	37	88,1

Table 1 shows that almost all elderly respondents (95.2%) are female. Almost all elderly respondents (78.6%) were in the age category 60-74 years. Almost half of the elderly respondents (33.3%) had grade 1 hypertension. Almost all elderly respondents (76.2%) had moderate stress levels. Almost all elderly respondents (88.1%) experienced poor sleep quality.

Table 2 Tabulation of the relationship between blood pressure and sleep quality

No	Category	Sleep quality		Amount	Statistic results
		Good	Poor		
1.	Normal	5 (11,9%)	7 (16,67%)	12 (28,57%)	
2.	Prehypertension	0 (0%)	9 (21,43%)	9 (21,43%)	
3.	Hypertension grade 1	0 (0%)	14 (33,33%)	14 (33,33%)	$\rho = 0{,}003$
4.	Hypertension grade 2	0 (0%)	7 (16,67%)	7 (16,67%)	
Amount		5 (11,9%)	37 (88,1%)	42 (100%)	

Table 2 shows that of 12 respondents who have normal blood pressure, most (58.3%) respondents have poor sleep quality. 9 respondents experienced prehypertension; all (100%) respondents experienced poor sleep quality. While 14 respondents experienced grade 1 hypertension, all (100%) experienced poor sleep quality and 7 respondents experienced grade 2 hypertension, all (100%) experienced poor sleep quality. Based on the results of statistical tests, there is a relationship between blood pressure and sleep quality in RW 10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya through the Chi-Square test with a significance level of $\alpha = 0.05$, the value $\rho = 0.003$ where ρ value $< \alpha$, Ho is rejected, which means there is a relationship between blood pressure and sleep quality.

Table 3 Tabulation of the relationship between stress level and sleep quality

No	Category	Sleep quality		Amount	Statistic results
		Good	Poor		
1.	Mild stress level	4	5	9	
		(9,52%)	(11,91%)	(21,43%)	
2.	Moderate stress level	1	31	32	
		(2,38%)	(73,81%)	(76,19%)	ρ = 0,008
3.	Heavy stress level	0	1	1	
		(0%)	(2,38%)	(2,38%)	
	Amount	5	37	42	
		(11,9%)	(88,1%)	(100%)	

Based on table 3 shows that 9 respondents who have mild stress levels, most (55.6%) respondents have poor sleep quality while 32 respondents who have moderate stress levels, almost all (96.9%) respondents experience poor sleep quality and 1 respondent has a severe stress level, all (100%) experience poor sleep quality. Based on the results of statistical tests, there is a relationship between stress levels and sleep quality in RW 10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya through the Chi Square test with a significance level of α = 0.05, the value ρ = 0.008 where ρ value < α, Ho is rejected, which means there is a relationship between stress levels and sleep quality.

Table 4 Tabulation of the relationship between age and sleep quality

No	Category	Sleep quality		Amount	Statistic Results
		Good	Poor		
1.	Middle age (45-59 years)	0	0	0	
		(0%)	(0%)	(0%)	
2.	Elderly (60-74 years)	4	29	33	
		(9,52%)	(69,05%)	(78,57%)	ρ = 0,936
3.	Old age (75-90 years)	1	8	9	
		(2,38%)	(19,05%)	(21,43%)	
4.	Very old age (>90 years)	0	0	0	
		(0%)	(0%)	(0%)	
	Amount	5	37	42	
		(11,9%)	(88,1%)	(100%)	

Table 4 shows that 29 respondents aged elderly (60-74) years have poor sleep quality. Based on the statistical test results, the value of ρ = 0.936 is obtained, which means that age is not related to sleep quality.

DISCUSSION

From the statistical test results, age is not associated with sleep quality. The results of statistical tests contradict the results of previous studies which state that the quality of sleep of the elderly who are not good also experiences differences in each characteristic of the elderly. This is supported by research that most of the elderly aged 60-74 years' experience poor sleep quality and it is also found that the elderly aged 75-89 years' experience a decrease in sleep quality. From this research it can be concluded that age greatly affects the quality of sleep of the elderly (Jepisa & Riasmini, 2020). This difference is because most of the respondents' ages are still in the early stages of 60 years, so that indeed in terms of sleep

Nety Mawarda Hatmanti - Blood Pressure, Stress Level, and Age with Sleep Quality in Elderly

quality they say that they can still sleep well. In the research data there were 9 elderly people aged in the range of 75-90 years, there were only most of the 8 elderly people who had poor sleep quality and only 1 elderly person who had good sleep quality and this was in line with previous research.

Elderly people who enter the age of 60-74 years at this age will experience a decrease in both physical and psychological factors and the increasing age the greater the risk of hypertension due to changes in blood vessel structure, namely narrowing of the lumen (Tyas & Zulfikar, 2021). Of the 33 elderly who are in this age category, 22 (66.67%) elderly people experience hypertension. This shows conformity with the theory of previous research. Based on gender, women are most affected by hypertension compared to men, this is in accordance with previous research that gender affects blood pressure (Nurhidayati, Aniswari, Sulistyowati, & Sutaryono, 2018). The results of the study also show that the quality of elderly sleep is significantly influenced by occupation, blood pressure, environment, age, gender, education, and marital status (Khalili, Z., Sadrollahi, A., Aseman, E., & Gholipour, 2017).

Based on the results of distributing PSS questionnaires, it was found that many elderly people had difficulty controlling anger. From this, it can be stated in question number 2, it is found that most elderly people say that they are often angry with their children and grandchildren if they ignore what is said. According to the researcher, this is due to the factor of increasing age, this is due to the heavier burden in life and more physiological functions that are increasingly experiencing a decline in various abilities such as visual ability, thinking, hearing, and remembering. In accordance with the opinion of Haryadi (2012) non-physical factors play a more significant role in influencing stress levels in the elderly such as nature, personality, perspective, and the level of education. Elderly people who always have a positive perspective will allegedly solve problems with a positive approach as well. Elderly people who always address problems positively, all the pressures of their lives will be considered small and can ultimately reduce stress.

CONCLUSION

The conclusion in this study is that blood pressure and stress levels are related to sleep quality, while age is not related to sleep quality.

REFERENCES

Akbar Harisa, Syahrul Syahrul, Yodang Yodang , Restu Abady, A. G. B. (2022). Analisis Faktor-Faktor yang Memengaruhi Kualitas Tidur Pasien Lanjut Usia dengan Penyakit Kronis. *Jurnal Kesehatan Vokasional*, *7*(1), 1–10.

Amicucci, G., Salfi, F., D'atri, A., Viselli, L., & Ferrara, M. (2021). The differential impact of COVID-19 lockdown on sleep quality, insomnia, depression, stress, and anxiety among late adolescents and elderly in Italy. *Brain Sciences*, *11*(10). https://doi.org/10.3390/brainsci11101336

Dahroni, D., Arisdiani, T., & Widiastuti, Y. P. (2019). Hubungan Antara Stres Emosi Dengan Kualitas Tidur Lansia. *Jurnal Keperawatan Jiwa*, *5*(2), 68. https://doi.org/10.26714/jkj.5.2.2017.68-71

Habibollahpour, M., Ranjkesh, F., Motalebi, S. A., & Mohammadi, F. (2019). The Impact of Benson's Relaxation Technique on the Quality of Sleep in the Elderly. *Topics in Geriatric Rehabilitation*, *35*(1), 88–94. https://doi.org/10.1097/TGR.0000000000000204

Hatmanti, N. M., & Muzdalifah, L. (2019). Hubungan Tingkat Depresi dengan Kejadian Insomnia pada Lanjut Usia di Griya Werdha Jambangan Surabaya. *Journal Health of Science*, *12*(1), 67–77. Retrieved from https://journal2.unusa.ac.id/index.php/JHS/article/view/832

Infodatin. (2022). *Lansia Berdaya, Bangsa Sejahtera*.

Jepisa, T., & Riasmini, N. M. (2020). *Karakteristik , Tingkat Depresi dan Faktor Lingkungan Fisik Dengan Characteristic , Depression Level , Physical Environment Factor with Sleep Quality of Geriatric Living at Pstw of Sumbar Provinces*. *4*(2), 152–159.

Ji, S., Wang, J., Wang, W., & Liao, F. (2022). Longer depressive duration reduces sleep duration more: A longitudinal study in the middle-aged and elderly Chinese. *Journal of Affective Disorders*, *317*(July), 185–192. https://doi.org/10.1016/j.jad.2022.08.051

Khalili, Z., Sadrollahi, A., Aseman, E., & Gholipour, F. (2017). Evaluation factors associated with sleep quality in the elderly shahid Beheshti hospital of Kashan. *Semantic Scholar*.

Nurhidayati, I., Aniswari, A. Y., Sulistyowati, A. D., & Sutaryono, S. (2018). Penderita Hipertensi Dewasa Lebih Patuh daripada Lansia dalam Minum Obat Penurun Tekanan Darah. *Jurnal Kesehatan Masyarakat Indonesia*, *13*, 4–8.

Tyas, S. A. C., & Zulfikar, M. (2021). HUBUNGAN TINGKAT STRESS DENGAN TINGKAT TEKANAN. *Jurnal Penelitian Keperawatan Kontemporer*, *1*(2), 75–82.