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Factors relating to the knowledge of the elderly in fall prevention through the use of modules

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ABSTRACT

The prevalence of fall risk in the elderly ranges from 26.7% to 29.8%. The aim of this study was to analyze the effectiveness of using the module in increasing awareness among elderly families about preventing falls at home based on demographic data (age, gender, education, employment and health status). The design of this research is Quasi Experimental and one group pretest-posttest. The research sample consisted of 25 respondents whose inclusion criteria were the elderly and nursing home caregivers. The sampling method uses random sampling using primary data. Data collection was carried out by pretest, then intervention, then posttest. Statistical analysis uses the Wilcoxon test. From the results of the analysis, there is a difference in average knowledge between before (pre-test) and after (post-test) health education. The difference in the average level of knowledge about fall prevention was less than 4 respondents, 16 respondents experienced an increase in knowledge and it remained the same. knowledge of 6 respondents with a Wilcoxon test result of 0.0003 ($p<0.005$). From the research results, it can be concluded that there is an influence of using a module on fall prevention on the knowledge of elderly people.

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1. Introduction

The elderly population continues to increase in almost all countries in the world. WHO estimates that by 2030, 1 in 6 people in the world will be elderly. Age 60 years and over is the final stage of the aging process which has an impact on three aspects, namely biological, economic and social. It is estimated that by 2050, the number of elderly people aged 60 years in the world will double to 2.1 billion. Meanwhile, the number of elderly people aged 80 years and over is estimated to reach 426 million, of which two-thirds are estimated to be in developing countries (WHO, 2021).

The percentage of the elderly population in Indonesia reached 10.7% in 2020 and is expected to continue to increase until it reaches 19.9% in 2045. Based on gender, there are more elderly women than elderly men, where the population of elderly women reaches 52.32. % while elderly men are only 47.68%. Based on data from the Central Statistics Agency for 2021 in Indonesia, around 29.52% of households are

inhabited by elderly people, of which around 9.99% of elderly people live alone. Elderly people who live alone are a risk group and require special attention (BPS, 2021).

The elderly are included in the vulnerable age group. Several factors that influence the vulnerability of the elderly include health problems and the elderly's need for companions/*caregiver*. This causes the elderly to really need support from the people who live with them. The aging process will cause various weaknesses in the elderly, which will increase the impact in the form of functional disorders, dependency and falls (Smith et al., 2017). The prevalence of fall injuries in people over the age of 55 years in Indonesia reached 49.4%, while for people aged > 65 years it was 67.1% (Kementerian Kesehatan Republik Indonesia, 2014). The prevalence of the risk of falling in elderly people aged 60-90 years reached 70.2%, with a prevalence of light fall risk of 48.6%, moderate fall risk of 16.2% and high fall risk of 5.4% (Erlini et al., 2017). As you get older, the risk of falling will increase. Falls are a cause of morbidity and mortality and the main cause of fatal injuries in the elderly. The severity of the injury varies. About 2.8 million were treated in emergency departments for fall-related injuries, 800,000 were hospitalized and about 27,000 seniors died from falls. The percentage of seniors who fall increases with age. In the age range 65-74 years, the risk of falling is 26.7%, at ages 75-84 it is 29.8% and 36.5% for seniors aged over 85 years (Cuevas-Trisan, 2019). The results of the study showed that elderly people aged 60-79 years had a high risk of falling at 47.3% and this increased to 64.1% at age > 80 years. In the same study, it was shown that 73.1% of elderly people who had a high risk of falling had experienced a fall, where female elderly people had a higher risk of falling by 1,749 times than male elderly people (Sharif et al., 2018; Smith et al., 2017).

Another factor that can influence the occurrence of falls in the elderly is health condition. Elderly people with hypertension will have a greater risk of falling compared to elderly people who do not have hypertension (Buford, 2016). Research results show that the use of antihypertensive drugs significantly increases the risk of falls (Butt et al., 2013). This is confirmed by other research which shows that long-term use of antihypertensive drugs can cause osteoporosis, which can increase the risk of falls in the elderly (EL-Bikai et al., 2015).

Physical activity is another factor that influences the occurrence of falls in the elderly. Research results show that there is a relationship between physical activity and risk in the elderly (Suwariyah & Pramithasari, 2019). Other research shows that physical activity has an indirect effect on the occurrence of falls (Duray & Genç, 2017).

In 2018, 27.5% of elderly people reported falling at least once in the past year and 10.2% reported injuries resulting from falls (Moreland et al., 2020). In addition, as many as 39% of people who have fallen have a fear of falling again, so they limit their activities more (Sharif et al., 2018). This is reinforced by research results which show that there is an increase in deaths due to falls, where the largest increase occurs in people aged 85 years (Moreland et al., 2020).

The role of the health sector in preventing and overcoming the problem of falls in the elderly is not optimal. Based on the results of observations in the field, it was found that the knowledge of the elderly and their families was still low in recognizing the health problems of the elderly, the family's lack of ability to care for the elderly at home, modify the environment and seek medical assistance at the health service facilities. One form of increasing knowledge is through providing counseling. The benefit provided by providing fall prevention education is that the elderly receive information about falls so that it is hoped that the elderly and their families can fnd out the causes and prevent falls which in the end is expected to reduce the number of falls in the elderly through intervention efforts on behavioral factors. This effort can be carried out through two approaches, that is education or coercion/pressure. Of the two approaches, the educational approach is the most appropriate approach as an effort to solve public health problems through behavioral factors. Health education is defined as health education activities carried out by disseminating messages and instilling confidence. Increasing the elderly's knowledge about falls after being given counseling can occur due to the information transfer process so that they can increase knowledge about falls prevention (Iswati & Sulistyana, 2019).

The urgency of the research is efforts to improve health in the elderly through the topic of strengthening people's knowledge and habits in healthy behavior, that is by efforts to prevant falls in the elderly based on demographic data (age, gender, education, employment and health status).

2. Methods

This research uses a quantitative research design with a quasi-experimental approach*one group with pre & post test*, where the researchers carried out treatment on respondents, namely in the form of measuring knowledge before and after giving the module to the elderly and nursing home caregivers, accompanied by an explanation regarding the prevention of falls in the elderly in nursing homes. The research location was carried out on the relationship between age, gender and health status with elderly knowledge in preventing falls in the orphanage through the use of the falls prevention module in the Karawang Elderly Social Rehabilitation Service Unit. The research was conducted in the even semester of the 2022 and 2023 academic years. The research population and sample were the elderly and nursing home caregivers, with a sample size of 25 respondents. Data collection techniques using*accidental sampling*, using data collection tools, namely modules and questionnaires containing an assessment of the knowledge of the elderly and elderly caregivers, demographic data, namely demographic data (age, gender and health status). Bivariate analysis of research results used chi square, and Wilcoxon.

3. Result and Analysis

Based on univariate analysis including demographic data and appropriate dependent and independent variables as follows:

Tablel 1
Frequency Distribution of Age, Gender, Health Status, Respondent Status, Pre Test Results and Post Test Results At the Karawang Elderly Social Rehabilitation Services Unit

NO	VARIABEL	JUMLAH	PERCENTAGE
1	Gender		
	Man	7	26,9
	Woman	19	73,1
2	Type of Responden		
	Officer	3	11,5
	Elderly	23	88,5
3	Health Status		
	Nor Health	8	30,8
	Health	18	69,2
4	Age		
	Middle Elderly	13	50
	Late Elderly	13	50
5	Pre Test Knowledge		
	Less	13	50
	Good	13	50
6	Post Test Knowledge		
	Less	9	34,6
	Good	17	65,4
7	Knowledge Enhancemen		
	Less		
	Good	17	65,4
		9	34,6

Based on the table above of 26 respondents, based on gender the largest number was in the female group 19 respondents (73.1%), based on the type of respondent the largest number were elderly

with 23 respondents (88.5), based on the health status of the group with the most 18 respondents were healthy/independent (69.2), based on the age group the number between the middle and late elderly was the same, namely 13 respondents (50%), at the pre-test level of knowledge the poor and good knowledge groups had the same number, namely 13 respondents (50%), the post test knowledge level variable was mostly in the good knowledge group, 17 respondents (65.4%). In the knowledge increase variable, the most frequent group was the less knowledge increase group, 17 respondents (65.4%).

Table 2
Frequency Distribution of Pre Test Results and Post Test Results
At the Karawang Elderly Social Rehabilitation Services Unit

NO	KNOWLEDGE LEVEL	MEAN	MEDIAN	SD	MINIMUN	MAKSIMUM
1	Pre test	10,615	11,5	4,54	0	19
2	Post test	12,85	15	3,196	6	15

Based on the table above, the average pre-test score is 10.615, the median score is 11.5, with the smallest (minimum) score being 0 and the highest score being 19. In the post-test assessment the average score is 12.85, the median score is 15, The lowest value is 6 and the highest value is 15.

Table 3
Relationship between gender and level of fall prevention knowledge
At the Karawang Elderly Social Rehabilitation Services Unit

No	GENDER	Knowledge						P Value	OR	95 % / C	
		Less		Good		Total				Lower	Upper
		N	%	n	%	N	%				
1	Men	4	66,7	2	33,3	6	100				
2	Woman	13	65	7	35	20	100	1,000	1,077	0,156	7,420
	Total	17	65,4	9	34,6	26	100				

Based on the table above, of the 26 respondents, in the male group there were 2 respondents (33.3%) who had good knowledge, while the female group had good knowledge as many as 7 people (35%). The statistical test result of the p value is 1.000, meaning there is no relationship between gender and the level of fall prevention knowledge.

Table 4
Relationship between age and level of fall prevention knowledge
At the Karawang Elderly Social Rehabilitation Services Unit

No	AGE	Knowledge						P Value	OR	95 % / C	
		Less		Good		Total				Lower	Upper
		n	%	n	%	N	%				
1	Middle Elderly	9	69,2	4	30,8	13	100				
2	Late Elderly	8	61,5	5	38,5	13	100	1,00	1,406	0,277	7,131
	Total	17	65,4	9	3406	26	100				

Based on the table above, of the 26 respondents, 4 respondents in the middle elderly group had good knowledge (30.8%), while 5 people in the late elderly group had good knowledge (38.5%). The statistical test result of the p value is 1.000, meaning there is no relationship between age and the level of fall prevention knowledge.

Table 5
Relationship between Health Status and Level of Fall Prevention Knowledge in the Karawang Elderly Social Rehabilitation Service Unit

No	Health Status	Knowledge						P.Value	OR	95 % / C	
		Less		Good		Total				Lower	Upper
		n	%	n	%	N	%				
1	Not healthy	5	62,5	3	37,5	8	100	1,000	0,83	0,147	4,723
2	Healthy	12	66,7	6	33,3	18	100				

Total	17	65,4	9	34,6	26	100	3

Based on the table above, out of a total of 26 respondents, in the group with poor health status there were 3 respondents (37.5%), while in the group of healthy elderly people with good knowledge there were 6 people (33.3%). The statistical test result of the p value is 1.000, meaning there is no relationship between health status and the level of knowledge about fall prevention.

Table 6
Effectiveness of Using the fallprevention module in increasing knowledge of falls prevention in the elderly in the Karawang Elderly Social Rehabilitation Service Unit

No	Tingkat Pengetahuan	N	Mead Rank	Pvalue	Minimun	Maksimum
1	Negative ranks	4	6,63	0,003	0	19
2	Positif ranks	16	11,47		6	15
3	Ties	6				
	Total	26				

Based on the table above, the difference in the average level of fall prevention knowledge was reduced by 4 respondents, 16 respondents experienced an increase in knowledge and 6 respondents remained in knowledge with a Wilcoxon test result of 0.0003 ($p < 0.005$).

Based on the research results, data was obtained The relationship between gender and the level of knowledge about fall prevention is that out of a total of 26 respondents, in the male gender group there were 2 respondents (33.3%), while the female group had good knowledge as many as 7 people (35%). The statistical test result of the p value is 1.000, meaning there is no relationship between gender and the level of fall prevention knowledge. According to researchers, gender in the research results has no relationship with the level of knowledge regarding the condition of the elderly, whether male or female, there is a decline in memory, reading ability decreases so that providing knowledge through the use of modules is not meaningful or has less benefits. As is known, a person's level of knowledge is also influenced by direct experience, such as information from health services (Notoatmodjo, 2010). This agrees with research by Romario (2012), which shows that the lack of knowledge of older people is influenced by a lack of information. If related to this research, the level of knowledge of elderly people about falls is not influenced by gender, because a person's knowledge is influenced by life experiences. The results of the study are not in line with research results from other studies which show that elderly people aged 60-79 years have a high risk of falling at 47.3% and this increases to 64.1% at ages > 80 years. In the same study, it was shown that 73.1% of elderly people who had a high risk of falling had experienced a fall, where female elderly people had a higher risk of falling by 1,749 times than male elderly people (Sharif et al., 2018; Smith et al., 2017). Where female elderly people have a higher risk of falling by 1,749 times than male elderly people (Sharif et al., 2018).

Based on the research results, out of a total of 26 respondents, in the middle elderly group there were 4 respondents (30.8%) who had good knowledge, while in the late elderly group with good knowledge there were 5 people (38.5%). The statistical test result of the p value is 1.000, meaning there is no relationship between age and the level of fall prevention knowledge. This finding is in accordance with the results of other research conducted by Zarpas and Lagana (2015) where there was no relationship between age and falls. They stated that it is the physical condition and health condition of the elderly that determines the high or low risk of falling, not age. This finding is in accordance with the results of other research conducted by Zarpas and Lagana (2015) where there was no relationship between age and the incidence of falls. They stated that it is the physical condition and health of the elderly that determines the high or low risk of falling, not age. This can be explained that good body balance influences the risk of falling itself, controlled by the sensory information system (whose components include visual, vestibular and somatosensory), muscle strength, synergistic postural muscle response, adaptability, and joint range of motion (Mamikonian-Zarpas & Laganá, 2015). Factors that influence body balance include: center of gravity (COG), line of gravity (Line of Gravity - LOG), and fulcrum (Base of Support - BOS) Suhartono (2005). It can be concluded that if an elderly person's body is

prime in terms of control and other body components, regardless of age, it will affect the balance of the elderly body, resulting in the risk of falls and vice versa.

However, the percentage of elderly people who fall increases as they get older. In the age range 65-74 years the risk of falling is 26.7%, at ages 75-84 it is 29.8% and 36.5% for elderly people aged more than 85 years (Cuevas-Trisan, 2019). Falls are a cause of morbidity and mortality and the main cause of fatal injuries in the elderly. The severity of the injury varies. About 2.8 million were treated in emergency departments for fall-related injuries, 800,000 were hospitalized and about 27,000 seniors died from falls. Several factors that influence the vulnerability of the elderly include health problems and the elderly's need for companions/*caregiver*. This causes the elderly to really need support from the people who live with them. The aging process will cause various weaknesses in the elderly, which will increase the impact in the form of functional disorders, dependency and falls (Smith et al., 2017).

Based on the research results, out of a total of 26 respondents, in the group with unhealthy health status there were 3 respondents (37.5%), while in the healthy elderly group with good knowledge there were 6 people (33.3%). The statistical test result of the p value is 1.000, meaning there is no relationship between health status and the level of knowledge about fall prevention. Health status affects a person's function, including the elderly. Based on the results of this study, it shows that there is no relationship between health status and increased knowledge of falls prevention.

Falls in the elderly are influenced by the poor physical condition and health of the elderly, so that it will affect the level of concentration in learning, so providing counseling to the elderly must be accompanied by a caregiver or companion for the elderly. Another factor that can influence the occurrence of falls in the elderly is health condition. Elderly people with hypertension will have a greater risk of falling compared to elderly people who do not have hypertension (Buford, 2016). Research results show that the use of antihypertensive drugs significantly increases the risk of falls (Butt et al., 2013). This is confirmed by other research which shows that long-term use of antihypertensive drugs can cause osteoporosis, which can increase the risk of falls in the elderly (EL-Bikai et al., 2015). Physical activity is another factor that influences the occurrence of falls in the elderly. Research results show that there is a relationship between physical activity and risk in the elderly (Suwariyah & Pramithasari, 2019). Other research shows that physical activity has an indirect effect on the occurrence of falls (Duray & Genç, 2017). In 2018, 27.5% of elderly people reported falling at least once in the past year and 10.2% reported injuries resulting from falls (Moreland et al., 2020). In addition, as many as 39% of people who have fallen have a fear of falling again, so they limit their activities more (Sharif et al., 2018). This is reinforced by research results which show that there is an increase in deaths due to falls, where the largest increase occurs in people aged 85 years (Moreland et al., 2020).

Based on the research results, there was a difference in the average level of fall prevention knowledge, which was reduced by 4 respondents, 16 respondents experienced an increase in knowledge and 6 respondents who remained knowledgeable with a Wilcoxon test result of 0.0003 ($p < 0.005$). Judging from this data, the largest number of respondents were those whose knowledge remained the same, 16 out of 26 respondents, and those who experienced an increase were 6 more respondents than those who experienced a decrease in knowledge. There is a difference in the average pre-test and post-test scores, meaning that the post-test scores are higher than the pre-test scores, for this reason frequent counseling is needed to help remind the elderly because memory loss has occurred. There is a difference in the post test mean which is higher than the pre test score. So this can be used as an indicator of the success of using the fall prevention module in the elderly. This is in line with the opinion of (Iswati & Sulistyana, 2019). the benefit provided by providing fall prevention counseling is that the elderly get information about falls so that it is hoped that the elderly and their families can know the causes and prevent falls, which in the end is expected to reduce the incidence of falls in the elderly through intervention efforts on behavioral factors. This effort can be carried out through two approaches, namely education or coercion/pressure. Of the two approaches, the educational approach is the most appropriate approach as an effort to solve public health problems through behavioral factors. Health education itself is defined as health education activities carried out by disseminating messages and instilling confidence. Increasing the elderly's knowledge about falls after being given

counseling can occur due to the process of transferring information through various media, one of which is a module, so that they can increase knowledge about falls prevention.

4. Conclusion

Based on research that has been conducted, it can be concluded that turmeric acid drinks can reduce the scale of menstrual pain in young women. Curcumin works as an analgesic which inhibits the release of prostaglandins, thereby inhibiting uterine contractions and can reduce the pain of dysmenorrhoea. The contribution of this research is to develop a theory about complementary therapy using natural ingredients to reduce menstrual pain. This study has limitations in terms of sample size and research design. the number of samples is relatively small. It is recommended that future researchers use a qualitative research design to dig deeper individually regarding the things that cause the success of consuming turmeric tamarind in reducing the scale of pain during menstruation.

Reference

BPS. (2021). Statisti Penduduk Usia Lanjut 2021. In *BPS*. https://www.researchgate.net/publication/269107473_What_is_governance/link/548173090cf22525dcb61443/download%0Ahttp://www.econ.upf.edu/~reynal/Civil wars_12December2010.pdf%0Ahttps://think-asia.org/handle/11540/8282%0Ahttps://www.jstor.org/stable/41857625

Buford, T. W. (2016). Hypertension and aging. In *Ageing Research Reviews* (Vol. 26). https://doi.org/10.1016/j.arr.2016.01.007

Butt, D. A., Mamdani, M., Austin, P. C., Tu, K., Gomes, T., & Glazier, R. H. (2013). The risk of falls on initiation of antihypertensive drugs in the elderly. *Osteoporosis International*, *24*(10). https://doi.org/10.1007/s00198-013-2369-7

Cuevas-Trisan, R. (2019). Balance Problems and Fall Risks in the Elderly. *Clinics in Geriatric Medicine*, *35*(2), 173–183. https://doi.org/10.1016/j.cger.2019.01.008

Duray, M., & Genç, A. (2017). The relationship between physical fitness and falling risk and fear of falling in community-dwelling elderly people with different physical activity levels. *Turkish Journal of Medical Sciences*, *47*(2). https://doi.org/10.3906/sag-1511-101

EL-Bikai, R., Tahir, M. R., Tremblay, J., Joffres, M., Seda, O., Sedová, L., Awadalla, P., Laberge, C., Knoppers, B. M., Dumas, P., Gaudet, D., Ste-Marie, L. G., & Hamet, P. (2015). Association of age-dependent height and bonemineral density decline with increased arterial stiffness and rate of fractures in hypertensive individuals. *Journal of Hypertension*, *33*(4). https://doi.org/10.1097/HJH.0000000000000475

Erlini, V., Untari, I., & Sarifah, S. (2017). Hubungan Antara Tingkat Kemandirian Aktifitas Fisik Dengan Resiko Jatuh Pada Lansia. *Profesi (Profesional Islam) Media Publikasi Penelitian*, *15*(1), 1–10. ejournal.stikespku.ac.id

Iswati, & Sulistyana, C. S. (2019). Peningkatan Pengetahuan Lansia Tentang Pencegahan Jatuh Melalui Penyuluhan Di Asrama Brimob Rt 02 Rw 02 Kelurahan Morokrembangan Kecamatan Krembangan Surabaya. *Adi Husada Nursing Journal*, *5*(1), 6–11.

Kementerian Kesehatan Republik Indonesia. (2014). Situasi dan Analisis Lanjut Usia. In *Pusat Data dan Informasi Kemenkes Ri* (Vol. 2, Nomor 2, hal. 1–8).

Mamikonian-Zarpas, A., & Laganá, L. (2015). The Relationship between Older Adults' Risk for a Future Fall and Difficulty Performing Activities of Daily Living. *Journal of Aging and Gerontology*, *3*(1). https://doi.org/10.12974/2309-6128.2015.03.01.2

Moreland, B., Kakara, R., & Henry, A. (2020). Trends in Nonfatal Falls and Fall-Related Injuries Among Adults Aged ≥65 Years — United States, 2012–2018. *MMWR. Morbidity and Mortality Weekly Report*, *69*(27), 875–881. https://doi.org/10.15585/mmwr.mm6927a5

Notoatmodjo, S. (2010). *Ilmu Perilaku Ksehatan*. Rineka Cipta.

Sharif, S. I., Al-Harbi, A. B., Al-Shihabi, A. M., Al-Daour, D. S., & Sharif, R. S. (2018). Falls in the elderly: Assessment of prevalence and risk factors. *Pharmacy Practice*, *16*(3), 1–7. https://doi.org/10.18549/PharmPract.2018.03.1206

Smith, A. de A., Silva, A. O., Rodrigues, R. A. P., Moreira, M. A. S. P., Nogueira, J. de A., & Tura, L. F. R. (2017). Assessment of risk of falls in elderly living at home. *Revista Latino-Americana de Enfermagem*, *25*.

https://doi.org/10.1590/1518-8345.0671.2754
Suwariyah, P., & Pramithasari, I. D. (2019). Analysis of Factors Related to the Occurance of Fall in Elderly. *Indonesian Journal of Global Health Research*, *1*(1). https://doi.org/10.37287/ijghr.v1i1.22
WHO. (2021). *Ageing and Health*.