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Factors Related to Dementia Among Elderly at Pagar Dewa Nursing Home in Bengkulu, Indonesia

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Abstract: Dementia is a clinical syndrome that includes loss of intellectual function and memory that causes daily life dysfunction. The purpose of this study was to determine factors associated with dementia among the elderly at the Pagar Dewa Nursing Home in Bengkulu. A cross-sectional study was conducted on 60 elderly, who were selected by Total Sampling technique. Based on the inclusion and exclusion criteria, a total of 50 elderly were recruited, and the data were collected from primary and secondary data. The result of this study showed there were 39 elderly (78%) with insufficient physical activity and 11 elderly (22%) with enough physical activity. There were 26 elderly (52%) with improper diet and 24 elderly (48%) with an appropriate diet. There were 20 elderly (40%) with poor resting habits and 30 elderly (60%) with adequate resting habits. There were 16 elderly (32%) had hypertension, two elderly (4%) had systolic hypertension, eight elderly (16%) had diastolic hypertension, and 24 elderly (48%) were not hypertensive. There were 36 elderly (72%) aged 60-74 years old, 13 elderly (26%), aged 75-90 years, and one elderly (2%), aged > 90 years. There were 29 elderly (58%) have dementia, and 21 elderly (42%) were not having dementia. There was a significant association between physical activity, diet, resting habits, hypertension, and age, with moderate to severe dementia. It is recommended to the nursing home to conduct a routine medical check-up and to conduct activities such as group activity therapy, exercise, and regulate the eating patterns and elderly resting habits.

Keywords: Elderly, Dementia

1. Introduction

Dementia is the fourth leading cause of death after heart disease, cancer, and stroke (Maharyani, 2010). The impact of this dementia incident if not handled among them, are changes in behavior towards the elderly such as forgetting himself, hostile to the people around him, and often wandering at night (Brooker, 2009).

Worldwide, 35.6 million people have dementia; this number will be multiplied by 2030 and more than triple by 2050 (WHO, 2012). There are 22 million people with dementia in Asia (Kemenkes RI, 2016). The number of people in Indonesia with dementia in 2013 reached 1 million people. That number is expected to rise dramatically to double by 2030, and to 4 million by 2050 (Kemenkes RI, 2016). While

in Bengkulu province, from the preliminary study at Pagar Dewa Nursing Home in Bengkulu found that 58% (35) elderly with dementia.

According to Hartati (2010) despite genetic factors, lifestyle is a major risk factor for various diseases, such as stroke, heart disease, hypertension. Another study conducted by Shafrina, et al. (2014) at Pekanbaru city, Indonesia, from 97 respondents found that from 45.5% respondents who have a healthy lifestyle there were only 1.8% of respondents who experienced cognitive impairment, there was a significant relationship between lifestyle and cognitive function changes.

Research conducted by Aditya (2015) in Manado city showed that 47.8% of elderly with dementia suffer from hypertension. Experts from Australian geriatric and psychogeriatric make an overview of risk factors based on research from around the world and make recommendations on lifestyle change strategies for the prevention of dementia and regularly check blood pressure and strive for high blood pressure and another vascular risk can be controlled (Martyn & Gale, 2002).

From the data above, the researchers concluded that the sufferers of dementia both in the World, Asia, and Indonesia and at the Pagar Dewa Nursing Home in Bengkulu is very high and increasing every year. In addition, some previous studies have also found that dementia can be caused by several other factors, which are lifestyle (Shafrina et al., 2014), age (Azizah, 2011), and hypertension (Aditya, 2015). Therefore, this study aimed to determine the correlation between physical activity, diet, resting habits, hypertension and age with dementia among elderly in the Bengkulu.

2. Methods

This research was conducted at Pagar Dewa Nursing Home in Bengkulu. This research used correlational descriptive with a cross-sectional approach. The population in this study was all elderly Pagar Dewa Nursing Home Bengkulu. This study was using total sampling technique. Data collection was performed by deploying a questionnaire consisting of MMSE consist of 10 items (Folstein et al., 1975), demographic data consist of 4 items, physical activity consists of 3 items, diet consist of 8 items, and resting habits consist of 4 items (Romaui, 2014). The data were analyzed using Chi-Square test.

3. Result

3.1 Univariate Analysis

Table 1. Distribution of Dementia at Pagar Dewa Nursing Home in Bengkulu.

No	Dementia Status	Frequency	Percentage (%)
1.	Dementia	29	58.0
2.	Not dementia	21	42.0
	Total	50	100.0

Table 1 showed that out of 50 elderly at Pagar Dewa Nursing Home in Bengkulu, there were more than half of the elderly with dementia, and the rest of the elderly do not experience dementia.

Table 2. Distribution of Physical Activity Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

No	Physical activity	Frequency	Percentage (%)
1.	Insufficient	39	78.0
2.	Sufficient	11	22.0
	Total	50	100.0

Table 2 showed that out of 50 elderly at Pagar Dewa Nursing Home in Bengkulu, there were 39 (78%) elderly had insufficient physical activity, and 11 (22%) elderly had sufficient physical activity.

Table 3. Distribution of Diet Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

No	Diet	Frequency	Percentage (%)
1.	Inappropriate	26	52.0
2.	Appropriate	24	48.0
	Total	50	100.0

Table 3 showed that out of 50 elderly at Pagar Dewa Nursing Home in Bengkulu, 26 (52%) of elderly have an improper diet, and 24 (48%) elderly has an appropriate diet.

Table 4. Distribution of Resting Habits Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

No	Rest	Frequency	Percentage (%)
1.	Inadequate	20	40.0
2.	Adequate	30	60.0
	Total	50	100.0

Table 4 showed that out of 50 elderly at Pagar Dewa Nursing Home in Bengkulu, there were, 20 (40%) elderly have poor resting habits, and 30 (60%) elderly have adequate resting habits.

Table 5. Distribution of Hypertension Among Elderly at Pagar Dewa Nursing Home Bengkulu.

No	Hypertension	Frequency	Percentage(%)
1.	Hypertension	16	32.0
2.	Systolic hypertension	2	4.0
3.	Diastolic hypertension	8	16.0
4.	No hypertension	24	48.0
	Total	50	100.0

Table 5 showed that out of 50 elderly at Pagar Dewa Nursing Home Bengkulu, 16 (32%) elderly suffer from hypertension, 2 (4%) elderly suffer from systolic hypertension, 8 (16%) elderly suffer diastolic hypertension, and 24 (48%) elderly people did not suffer from hypertension.

Table 6. Distribution of Age Among Elderly at Pagar Dewa Nursing Home Bengkulu.

No	Age	Frequency	Percentage (%)
1.	60 - 74 years	36	72%
2.	75 - 90 years	13	26%
3.	> 90 years	1	2%
	Total	50	100%

Table 6 showed that out of 50 elderly at Pagar Dewa Nursing Home Bengkulu; there are 36 (72%) elderly aged 60-74, 13 (26%) elderly aged 75-90 years, and 1 (2%) elderly age> 90 years.

3.2 Bivariate Analysis

This analysis was conducted to determine the relationship between independent variables (physical activity, diet, resting habit, hypertension, and age) with the dependent variable (Dementia) by using chi-square analysis, the test of contingency coefficient (C), and Odd Ratio (OR).

Table 7. The Result of Cross-Tabulation Between Physical Activity and Dementia Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

Physical activity	Dementia Status						P	C	OR
	Dementia		No Dementia		Total				
	f	%	f	%	f	%			
Insufficient	27	69.2	12	30.8	39	100.0	0.003	0.394	10.125
Sufficient	2	18.2	9	81.8	11	100.0			
Total	29	58.0	21	42.0	50	100.0			

Table 7 showed that among 39 elderly at Pagar Dewa Nursing Home in Bengkulu who had insufficient activity, there was 27 elderly having dementia and 12 did not have dementia. There were 11 elderly who had sufficient physical activity, with two elderly who have dementia and nine elderly who did not have dementia. The result of chi-square analysis (Fisher Exact Test) showed the value of $P = 0.003 < 0.05$, which is mean, there was a significant correlation between physical activity and dementia among elderly at Nursing Home Pagar Dewa in Bengkulu. The results of the contingency coefficient test obtained the value of $C = 0.394$ with $\text{approx.sig} = 0.002 < 0.05$ means significant. Value $C = 0.394$ is compared with the value of $C_{\max} = 0.707$ where the lowest value of the row or column is 2. Because the value of $C = 0.394$ not far with the value of $C_{\max} = 0.707$ then the category of relationship is moderate. Risk analysis results obtained $OR = 10,125$ means that elderly who experienced insufficient physical activity has a risk 10,125 times to experience dementia compared with elderly who have sufficient physical activity.

Table 8. The Result of Cross-Tabulation Between Diet and Dementia Among Elderly at The Pagar Dewa Nursing Home in Bengkulu.

Diet	Dementia Status						χ^2	P	C	OR
	Dementia		Not Dementia		Total					
	F	%	F	%	F	%				
Inappropriate	21	80.8	5	19.2	26	100.0	9.663	0.002	0.433	8.400
Appropriate	8	33.3	16	66.7	24	100.0				
Total	29	58.0	21	42.0	50	100.0				

Table 8 showed that among 26 elderly at Pagar Dewa Nursing Home in Bengkulu who had inappropriate diet, there were 21 elderly suffering from dementia and five people who did not have dementia. From 24 elderly who had appropriate diet, there were eight elderly who have dementia and 16 elderly who did not have dementia. Chi-square analysis (continuity correction) result showed value $\chi^2 = 9.663$ with $P = 0.002 < 0.05$, which is mean there is significant correlation between diet and dementia among elderly at Pagar Dewa Nursing Home in Bengkulu. The results of the contingency coefficient test obtained the value of $C = 0.433$ with $\text{approx.sig} = 0.001 < 0.05$ means significant. Value $C = 0.433$ is

compared with the value of $C_{\max} = 0.707$ where the lowest value of row or column is 2. Because the value of $C = 0.433$ not too far with the value $C_{\max} = 0.707$ then the category of relationship is moderate. Risk analysis results obtained $OR = 8,400$ means that elderly who have improper diet has a risk of 8,400 times to experience dementia compared with elderly who have an appropriate diet.

Table 9. The Result of Cross-Tabulation Between the Resting Habit and Dementia Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

Resting habits	Dementia Status						χ^2	P	C	OR
	Dementia		Not Dementia		Total					
	f	%	f	%	f	%				
Inadequate	17	85	3	15	20	100	8.214	0.004	0.408	8.500
Adequate	12	40	18	60	30	100				
Total	29	58	21	42	50	100				

Table 9 showed that among 17 elderly at Pagar Dewa Nursing Home in Bengkulu had an inadequate of resting habit there were 17 elderly with dementia and two without dementia. The 30 elderly people who had adequate resting habits, there were 12 elderly who had dementia and 18 elderly who did not have dementia. Chi-square analysis (continuity correction) obtained value $\chi^2 = 8,214$ with $P = 0.004 < 0.05$, which mean there is a significant correlation between resting habit and dementia among elderly Pagar Dewa Nursing Home in Bengkulu. The result of the contingency coefficient test obtained value $C = 0.408$ with $\text{approx.sig} = 0.002 < 0.005$ means significant. Value $C = 0.408$ is compared with the value of $C_{\max} = 0.707$ where the lowest value of the row or column is 2. Because the value of $C = 0.408$ not too far with the value $C_{\max} = 0.707$ then the category of relationship is moderate. Risk analysis results obtained $OR = 8,500$ means that elderly who have poor resting habit has risk 6.375 times to experience dementia compared with elderly who have adequate resting habits.

Table 10. The Result of Cross-Tabulation Between Hypertension and Dementia Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

Hypertension	Dementia Status						χ^2	P	C
	Dementia		Not Dementia		Total				
	f	%	f	%	f	%			
Hypertension	15	93.8	1	6.2	16	100	17.587	0.001	0.510
Systolic Hypertension	1	50.0	1	50.0	2	100			
Diastolic Hypertension	6	75.0	2	25.0	8	100			
No Hypertension	7	29.2	17	70.8	24	100			
Total	29	58.0	21	42.0	50	100			

Table 10 showed that among 16 elderly at Pagar Dewa Nursing Home in Bengkulu who have hypertension, there were 15 elderly who have dementia and one person who did not have dementia. From 2 elderly who had systolic hypertension, there was one elderly who have dementia and one elderly people who did not have dementia. Out of 8 elderly who experience diastolic hypertension there were six elderly who have dementia and two elderly people who did not have dementia. Out of 24 elderly who did not have hypertension, there were seven elderly who have dementia and 17 elderly who did not have dementia. The result of chi-square analysis (Pearson chi-square) obtained $\chi^2 = 17.587$ with $P = 0.001 < 0.05$, means there is a significant correlation between hypertension and dementia among elderly at

Pagar Dewa Nursing Home in Bengkulu. The results of the contingency coefficient obtained the value of $C = 0.510$ with $\text{approx.sig} = 0.001$ means significant. Value $C = 0.510$ is compared with the value of $C_{\text{max}} = 0.707$ where the lowest value of row or column is 2. Because the value of $C = 0.510$ not too far with the value $C_{\text{max}} = 0.707$ then the category of relationship is moderate.

Table 11. Results of Cross-Tabulation Between Age and Dementia Among Elderly at Pagar Dewa Nursing Home in Bengkulu.

Age	Dementia						χ^2	P	C
	Dementia		No Dementia		Total				
	F	%	F	%	F	%			
60-74 years	16	44.4	20	55.6	36	100.0	9.721	0.008	0.403
75-90 years	12	92.3	1	7.7	13	100.0			
>90 years	1	100.0	0	0	1	100.0			
Total	29	58.0	21	42.0	50	100.0			

Table 11 showed that among 36 elderly at Pagar Dewa Nursing Home in Bengkulu, who aged 60-74 years, there were 16 elderly with dementia and 20 who did not have dementia. Out of 13 elderly aged 75-90 years old, there are 12 elderly people who have dementia and one elderly people who did not have dementia. One elderly aged > 90 years have dementia. The result of Pearson chi-square analysis obtained that $\chi^2 = 9.721$ with $P = 0.008 < 0.05$, meaning that there was a significant correlation between age and dementia among elderly at Pagar Dewa Nursing Home in Bengkulu. The results of the contingency coefficient test obtained the value of $C = 0.403$ with $\text{approx.sig} = 0.008 < 0.05$ means significant. Value $C = 0.403$ is compared with the value of $C_{\text{max}} = 0.707$ where the lowest value of row or column is 2. Because the value of $C = 0.403$ not far with the value of $C_{\text{max}} = 0.707$ then the category of relationship is moderate.

4. Discussion

Physical activity was found positively correlated with dementia, elderly with insufficient physical activity has a risk 10.125 times to experience dementia compared with elderly who have sufficient physical activity. The result of the contingency coefficient test showed a moderate relationship category thus the factors that cause dementia were not only physical activity but also caused by other factors such as diet, resting habits, hypertension, and age that can cause dementia in the elderly. This result was concordant with the previous study by Effendi et al. (2014) that physical activity such as walking, running, affecting the brain's lobe, an area of mental concentration, planning, and decision-making, light physical activity such as walking can help prevent the body from preventing decreased brain power among the elderly. Moreover, a study conducted by Hidayat (2012) in South Sukabumi village showed that elderly suffering from dementia was elderly who have insufficient physical activity.

Based on Table 7, from 39 elderly at Pagar Dewa Nursing Home in Bengkulu who have insufficient physical activity, 12 people did not have dementia. This result can be explained, by other factors that could affect the rate of decline in cognitive function of the elderly. These factors include age, sex, genetics, lack of education, smoking, history of head trauma, physical activity, resting habits, degenerative diseases, infectious diseases and metabolism (AAZI, 2003).

There is a significant relationship between diet and dementia among the elderly at Pagar Dewa Nursing Home in Bengkulu. Elderly with appropriate diet had less risk of dementia than elderly with inappropriate diet. Some previous studies found the same result that diet was one factor that could be related to dementia, those studies were; Priyanto (2008), Umani and Priyanto (2012). Those study showed elderly with inappropriate diet had dementia.

This study found that there were eight elderly who had appropriate diet and have dementia due to many factors that could affect the decreasing of cognitive function among the elderly. These factors include age, sex, genetics, lack of education, smoking, history of head trauma, physical activity, resting

habits, degenerative diseases, infectious diseases and metabolism (AAZI, 2003). The result of the contingency coefficient test is obtained by a moderate relationship category. This shows the factors that cause dementia not only diet but also caused by other factors such as physical activity, resting habits, hypertension, and age that can cause dementia in the elderly.

This study found that resting habits were correlated with dementia among elderly at Pagar Dewa Nursing Home in Bengkulu (see Table 9). There were 30 elderly who have adequate resting habits at Pagar Dewa Nursing Home in Bengkulu. From 30 elderly there were 18 elderly people who did not have dementia and 12 elderly who had dementia. However, from 20 elderly who have poor resting habits, there were three elderly who did not have dementia. There are many factors that can affect the rate of decline in cognitive function of an elderly. These factors include age, sex, genetics, lack of education, smoking, history of head trauma, physical activity, resting habits, degenerative diseases, infectious diseases and metabolism (AAZI, 2003). The result of contingency coefficient analysis showed a moderate relationship category, which means that the factors that cause dementia is not just a resting habit but also caused by other factors such as physical activity, diet, hypertension, and age that can cause dementia in the elderly.

This result is in line with the theory according to the Ministry of Health of the Republic of Indonesia (Depkes RI, 2013) adequate resting habits is important for the body. Many people who sleep so limp, no spirit, irritability, and stress. One-third of the time in human life is to sleep. It is believed that sleep is very important for the maintenance of health and the healing process of disease, because sleep is beneficial to store energy, increase body immunity and speed up the healing process of the disease as well as during sleep to repair body parts. Generally, people will feel fresh and healthy after the rest and vice versa if we are not getting enough rest then the organ function will be a decline, and will decrease the immunity, so that will cause our body easily to experience various health problems, such as cognitive decline.

This result showed similar research conducted by Dhito (2015) at UPTD Puskesmas Bengkuring, which showed that there is a relationship between resting habits and cognitive function. And also other research conducted by Umami and Priyanto (2012) showed there is a relation between resting habits and cognitive function in Pasuruhan Village Mertoyudan Sub-district Magelang Regency.

Hypertension was found correlated with dementia. There were 15 elderly with hypertension have dementia, one elderly with systolic hypertension have dementia, six elderly people who experienced diastolic hypertension, have dementia. This result is in line with the study by Budiarto's (2008) that dementia can occur due to changes in blood pressure, one of which occurs in vascular insufficiency and vascular risk factors (high blood pressure or hypertension) that have an important role to the incidence of vascular dementia and Alzheimer's dementia. These results are supported by research conducted by Novita (2016) in Jimbaran Village District of Bandungan Semarang showed there is a correlation between hypertension with the incidence of dementia

The result of the contingency coefficient test is obtained by a moderate relationship category which means the factors that cause dementia not only hypertension but also caused other factors such as physical activity, diet, resting habits, and age that can cause dementia in the elderly. There were seven elderly who did not experience hypertension have dementia because many factors can affect the rate of decline in cognitive function of an elderly. These factors include age, sex, genetics, lack of education, smoking, history of head trauma, physical activity, resting habits, degenerative diseases, infectious diseases and metabolism (AAZI, 2003).

This study found there is a significant correlation between age and dementia among elderly at Pagar Dewa Nursing Home in Bengkulu, and the result of contingency coefficient test obtained moderate relationship category. Based on table 11, from 36 elderly age 60-74 years, there were 16 elderly experiencing dementia and 20 elderly who did not have dementia. 13 elderly aged 75-90 years old, there were 12 elderly who have dementia, and one elderly did not have dementia. And there was one elderly > 90 years have dementia. There are many factors that can affect the rate of decline in cognitive function of an elderly including age, sex, genetics, lack of education, smoking, history of head trauma, physical activity, resting habits, degenerative diseases, infectious diseases and metabolism (AAZI, 2003).

This result is in line with the study by Gunawan (2001) that showed, dementia tendency rapidly to grow 12% at aged 70 - 74 years and to 40% at age 85-89 years. These results supported by research conducted by Musrifatul, et al. (2009) at Tresna Werdha Budi Sejahtera Banjarbaru Nursing Home of

South Kalimantan that showed that most had severe dementia at age (75-90) years and a small percentage of severe dementia at a very old age (> 90) years.

5. Conclusion

This study showed some factors that have significant relationship and dementia, which are physical activity, diet, resting habit, hypertension, age among elderly at Pagar Dewa Nursing Home in Bengkulu with the category of moderate relationship.

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