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THE RELATIONSHIP OF PHYSICAL ACTIVITY AND SLEEP QUALITY AMONG ELDERLY WHO ARE STILL WORKING

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ABSTRACT

Introduction: The elderly tend to have short sleep duration, resulting in poor sleep quality. Physical activity is believed can improved sleep quality. This study was aimed to explain the relationship between physical activity and sleep quality among the elderly who are still working.

Method: This study used a correlational research design with a cross-sectional approach. There were 63 elderly who involved as respondents by using the simple random sampling technique. The independent variable of this research was physical activities, while the dependent variable was sleep quality. A questionnaire was used to collect data. Data were then analyzed by using the Chi-Square test with a significance level of p=0.05.

Results: The study found that physical activity correlates with sleep quality among the elderly who are still working (p=0.021). The elderly with moderate physical activity has three times chance to have a good sleep quality (OR=3.667).

Conclusion: Moderate physical activity correlates with good sleep quality. However, an increase in physical activity will worsen the sleep quality among the elderly. The elderly who are still working can reduce the intensity of their activity in the workplace.

Keywords: physical activity; sleep quality; elderly; healthy lifestyle.

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INTRODUCTION

Sleep is vital to restore one's energy, including the elderly (P2PTM Kemenkes RI, 2020). The elderly also tends to have a short sleep duration, resulting in poor sleep quality (Chasanah, 2017). Factors that cause sleep disorders in the elderly includes age, gender, education level, type of work, marital status, coffee consumption, anxiety, environmental conditions, and health status (Sumirta and Laraswati, 2014). Therefore, sleep disorders are often experienced by the elderly.

Sleep disturbances worsen the quality of sleep among the elderly. It will make them easily get tired throughout the day. It can be caused by their daily activity, which tends to be too heavy for their health (Fitri Nur Laili, 2018). In a preliminary study conducted on the elderly in West Pademawu Village, Pademawu District, the heavy activities carried out daily by the elderly were hoeing and ploughing the fields and lifting heavy loads.

According to previous research data, the elderly who have difficulty to fall asleep are 67-78.1% (Dewi et al., 2020; Ariana, Putra and Wiliantari, 2020). The elderly group complains of difficulty sleeping 40%, often waking up at night 30%, and others having another sleep needs disorders (Chasanah, 2017). A very high prevalence was shown in the study.

From the data obtained at the West Pademawu Village Hall in March 2021, the total number of older adults recorded was 136 older adults in West Pademawu Village. The number of older adults is as many as 18 people and 118 women. All of the elderly are >60 years old, and some are still working. The majority of the elderly who still work in West

Pademawu Village are agricultural labourers and traders. From the results of a preliminary study conducted on March 5, 2021, 3 older adults who were still working experiencing sleep disturbances due to being in the fields for too long and trading in the market.

Most elderly still working were men, namely 61.47% (Kementerian Kesehatan RI, 2013). From these data, older adults exceed half the percentage of older adults still working in Indonesia. Older women are still less in comparison to the number of older men. As a result of these activities, the elderly need more time to sleep to maintain a balance of energy expended. This can be seen in the elderly who have carried out physical activities that are tired. The elderly will be faster to sleep due to Non-Rapid Eye Movement (NREM) or shortened slow-wave sleep stage (Fitri Nur Laili, 2018). The stages of sleep waves are different for each individual and differ between men and women.

The physical activity recommended by WHO according to the 2008 Global Recommendations Physical Activity for Health is that older adults over or equal to 65 years old do physical activity to improve balance and fall potential three times a week. Then do muscle-strengthening every two or more times a week. The physical activity carried out is adjusted to the health and physical conditions of each elderly. The duration of physical activity carried out in a week is 60 minutes (KPKN, 2019). This can make the elderly perform regular physical activity and perform movements according to their abilities so that sleep quality is maintained. The researchers want to analyze the relationship between physical activity and sleep quality in the elderly working in the West Pademawu Village, Pamekasan Regency.

METHOD

This study is a quantitative study with a cross-sectional design. This research was conducted on 28-30 May 2021 with an affordable elderly population of 75 older adults working in West Pademawu Village, Pamekasan Regency. Samples were obtained as many as 63 elderly who are still working using simple random sampling. The number of samples in this study was determined by the inclusion and exclusion criteria. The inclusion criteria in this study were the elderly aged 60 years who lived permanently in West Pademawu Village, Pamekasan Regency, and the elderly who were still active in activities and work. The exclusion criteria in this study were the elderly who were sick. The independent variable in this study was physical activity. The level of physical activity was measured using the WHO GPAQ (Global Physical Activity Questionnaire) questionnaire, translated into Indonesian. Respondents were asked to fill out a physical activity questionnaire consisting of 16 questions about activities at work, travel from place to place, sports activities, and sedentary activities. Scores on the physical activity variable were low <600 MET, moderate 3000> MET 600, and high 3000 MET. The dependent variable in this study is sleep quality. The level of sleep quality was measured using the PSQI (Pittsburgh Sleep Quality Index) questionnaire. Respondents were asked to fill out a sleep quality questionnaire containing nine calculated questions and one additional question only as additional medical information. This questionnaire is about subjective sleep quality, latency, sleep duration, sleep efficiency, sleep disturbances, sleeping pills, and daytime dysfunction. For subjective sleep quality questions, coding is excellent 0, good 1, less 2, and very poor 3. The final score of this questionnaire is the sum of all components with a value of 5 good sleep quality and >5 good sleep quality. The data collected was then analyzed using the chi-square hypothesis test with a significance level of $p = 0.05$. This research has been reviewed and approved by the Health Research Ethics Commission, Faculty of Nursing, AirlanggaUniversity with No. 2260-KEPK.

RESULTS

Based on table 1.1 shows the characteristics of elderly respondents in West Pademawu Village. The characteristics include; 29 male respondents (46.1%), and 34 female respondents (53.9%). Most respondents are female respondents. Elderly age is divided into several groups of elderly, including Young Elderly (LM) aged 60-69.9 years, Old Elderly (LT) 70-79.9 years, and Very Old Elderly (LST) 80 years and over. The Young Elderly group in this study amounted to 49 people (77.8%), the Old Elderly amounted to 11 people (17.4%), and the Very Old Elderly amounted to 3 people (4.8%). For the latest education, most of them graduated or did not graduate from Elementary School, namely 41 people (65.1%), seven people graduated from Junior High School (11.1%), six people graduated from Senior High School (9.5%). They graduated from college/college as many as nine people (14.3%). There were 31 older adults (49.2%) who had a history of the disease and 32 people (50.8%) who did not have a history of the disease. History of the elderly who have the disease include; 16 people with uric acid, six people with diabetes mellitus, and nine people with other diseases. The elderly who are still

Table 1. Demographic Characteristics of Respondents (n=63)

Demographic Characteristics of Respondents	f	%
Gender		
Male	29	46.1
Female	34	53.9
Age		
Young Elderly	49	77.8
Old Elderly	11	17.4
Very Old Elderly	3	4.8
Last Education		
Graduated/Ungraduated Elementary School	41	65.1
Graduated Junior High School	7	11.1
Senior High School	6	9.5
Graduated University	9	14.3
Disease History		
Have a History of Current Illness	31	49.2
No History of Current Illness	32	50.8
Profession		
Farmer	42	66.7
Trader/Entrepreneur	14	22.2
Retired Civil Servant	7	11.1

Table 2. Hypothesis Analysis of the Relationship of Physical Activity and Sleep Quality in The Elderly Workers

Physical Activity	Bad f (%)	Good f (%)	Total f (%)	Chi-Square Test	Odds Ratio (OR)
Tall	32 (50.8%)	12 (19%)	44 (69.8%)	0.021	3.667
Currently	8 (12.7%)	11 (17.5%)	19 (30.2%)		
Total	40 (63.5%)	23 (36.5%)	63 (100%)		

active in work and active in carrying out activities in West Pademawu are 42 farmers/farmers (66.7%), 14 traders/entrepreneurs (22.2%), and seven retired civil servants (11.1%).

The table shows that the highest number is found in respondents with high-intensity physical activity who have poor sleep quality, as many as 32 elderly (50.8%). Based on the results of the correlation test, a significance value of 0.021 was obtained. Because the significance value is 0.021 and the value is <0.05, it can be seen that there is a significant relationship between the independent and dependent variables. It can be concluded that the physical activity carried out by the elderly correlates with the quality of their sleep. The magnitude of the correlation between physical activity and sleep quality is 3,667, which means the opportunity for elderly who have moderate-intensity physical activity has three times the opportunity to get good sleep quality than the elderly who do high-intensity physical activity.

DISCUSSION

The elderly working in West Pademawu Village still does not carry out the physical activity as recommended, namely, do sufficient physical activity within a week of at least 10 minutes. 150 minutes for moderate physical exercise and 17 minutes for heavy physical exercise (Kementerian Kesehatan Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat, 2018). Elderly who works as farmers on average work for approximately 6-8 hours per day. Elderly farmers start their activities in the morning and end in the afternoon. Sometimes elderly farmers work at night, especially during the dry season. Elderly farmers admitted that they are more comfortable doing their activities at night during the dry season because the sun is not too stinging. The work they do is watering tobacco at the beginning of the season, making it easier for elderly farmers to work. The elderly who work as traders in local markets work only 4-5 hours per day. Elderly traders work according to the amount of merchandise brought. Elderly vegetable traders usually only spend 1-2 hours at the market. The rest continue selling at home. In contrast, the elderly who trade livestock can be up to 5 hours in the market. The elderly who work as retired civil servants are the elderly who are still actively working and carrying out activities. Some of the retired civil servants in West Pademawu have their gardens in the fields or homes. Elderly retired civil servants do gardening activities and go to the fields every day but with moderate intensity. The elderly who work as farmers in the fields and the elderly who work as traders in the market carry out physical activities with a higher intensity than the elderly who work as retired civil servants. As for the elderly who work as traders at home, some do high-intensity physical activity and some moderate. This is

because there are elderly who trade while working in the fields. In the elderly, entrepreneurs work for almost 6 hours per day, every Friday; burning is usually carried out and will increase the time for physical activity.

Most elderly have problems in their body condition, so they need balance sessions at least three times a week and muscle training at least two times a week (Kementerian Kesehatan Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat, 2018). Most of the elderly in West Pademawu Village is still working, so they do not do physical activities that do not follow WHO recommendations. In conclusion, the elderly who are still working perform physical activity with moderate-high intensity.

The majority of the elderly who are still working are farmers or farm labourers who do much physical activity with high intensity, namely lifting heavy loads, hoeing fields, and doing other field work. There is a division of roles for the elderly who work as farmers. Elderly male farmers carry out heavy physical activities, namely lifting heavy loads, hoeing rice fields, and doing other heavy work. The elderly female farmers do not do too strenuous activities; they keep doing activities for the same hours as elderly male farmers. The majority of the free time or leisure that is owned is only used to sit back and relax or just watch TV. The free time used by the elderly who are still working starts from 10 minutes to 360 minutes or 6 hours. Free time is used to rest or lie in bed until going to work again or waiting until bedtime. These data indicate that most of the elderly who are still working perform physical activities with high intensity, and it is necessary to change the physical activity carried out by the elderly.

The elderly who are still working in West Pademawu Village still do not carry out the physical activity as recommended, namely doing sufficient physical activity within a week of at least 10 minutes. 150 minutes for moderate physical exercise and 17 minutes for heavy physical exercise (Kementerian Kesehatan Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat, 2018). Elderly who work as farmers on average work for approximately 6-8 hours per day. Elderly farmers start their activities in the morning and end in the afternoon. Sometimes elderly farmers work at night, especially during the dry season. Elderly farmers admitted that they are more comfortable doing their activities at night during the dry season because the sun is not too stinging. The work they do is watering tobacco at the beginning of the season makes it easier for elderly farmers to work. The elderly who work as traders in local markets work only 4-5 hours per day. Elderly traders work according to the amount of merchandise brought. Elderly vegetable traders usually only spend 1-2 hours at the market. The rest continue selling at home. In contrast, the elderly who trade livestock can be up to 5 hours in the market. The elderly who work as retired civil servants are the elderly who are still actively working and carrying out activities. Some of the retired civil servants in West Pademawu have their gardens in the fields or homes. Elderly retired civil servants do gardening activities and go to the fields every day but with moderate intensity. The elderly who work as farmers in the fields and the elderly who work as traders in the market carry out physical activities with a higher intensity than the elderly who work as retired civil servants. As for the elderly who work as traders at home, some do high-intensity physical activity and some moderate. This is because there are elderly who trade while working in the fields. In the elderly, entrepreneurs work for almost 6 hours per day, every Friday; burning is usually carried out and will increase the time for physical activity.

Most elderly have problems in their body condition, so they need balance sessions at least three times a week and muscle training at least two times a week (Kementerian Kesehatan Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat, 2018). Most of the elderly in West Pademawu Village is still working, so they do not do physical activities that do not follow WHO recommendations. In conclusion, the elderly who are still working perform physical activity with moderate-high intensity. This is in line with the results of filling out the GPAQ questionnaire by the elderly who are still working. There are results in high-intensity physical activity and moderate-intensity physical activity categories. Domains or aspects of the GPAQ physical activity questionnaire are activities at work, sports or recreation, and habits or leisure time. Of the three domains or aspects in the GPAQ questionnaire, the activity at work has an immense contribution or influence on the level of physical activity of the elderly who are still working. The data and results of the study indicate that the respondents carry out activities with high to moderate intensity. This will undoubtedly affect the significant increase in breathing or heart rate of the elderly working. The majority of the elderly still working are farmers or farm labourers who do much physical activity with high intensity, namely lifting heavy loads, hoeing fields, and doing other field work. There is a division of roles for the elderly who work as farmers. Elderly male farmers carry out heavy physical activities, namely lifting heavy loads, hoeing rice fields, and doing other heavy work. The elderly

female farmers do not do too strenuous activities; they just keep doing activities for the same hours as elderly male farmers.

Recreational activities contributed little to fill out the GPAQ questionnaire. Most of the still working elderly never go for recreational activities such as playing soccer or the like. Only two older adults are still working who have routine recreational activities every week, namely playing badminton on the badminton court with their friends for 3 hours and jogging with their grandchildren for 10 minutes. Apart from that, all the elderly who are still working have never exercised regularly because they still prefer to work. The majority of the free time or leisure that is owned is only used to sit back and relax or just watch tv. The free time used by the elderly who are still working starts from 10 minutes to 360 minutes or 6 hours. Free time is used to rest or lie in bed until going to work again or waiting until bedtime. These data indicate that most of the elderly who are still working perform physical activities with high intensity, and it is necessary to change the physical activity carried out by the elderly.

The results of hypothesis testing indicate that physical activity affects sleep quality in the elderly who are still working in West Pademawu Village, Pamekasan Regency. The results of this study are in line with previous research conducted by Muhammad Dien Iqbal in 2017, which found a significant relationship between the level of physical activity and the sleep quality of overseas students in Yogyakarta with a significant result $p=0.006$ ($p<0.05$). These data are empirical evidence that sleep quality is obtained from the influence of daily physical activity. Suppose the elderly are still working actively but also maintain the intensity of their physical activity. In that case, the elderly will have the opportunity to get good quality sleep and reduce risk factors that occur in the quality of life of the elderly.

According to Baso, Langi, and Sekeon (2019), fatigue can affect a person, especially the elderly, because fatigue due to physical activity requires energy. Someone who does physical activity and feels tired, then that person will fall asleep faster because of the shortened slow-wave (NREM) (Uliyah & Hidayat, 2008) in (Baso, Langi and Sekeon, 2019). Doing physical activity is very useful in regulating the heart system, blood vessels, and body weight and is essential in preventing non-communicable diseases (Kementerian Kesehatan RI, 2013).

The sleep quality of the elderly who are still working can be improved through excellent and regular physical activity. Maintain a physical activity pattern, limit the range of motion for physical activities that require a large amount of energy, and manage the time of physical activity as well as possible. Because of the work demands, the elderly who are still working can manage the intensity of their physical activity better, such as reducing the time to work and doing activities that only require less energy. If you feel tired, it is recommended to rest immediately. This can promote better sleep quality through the intensity of physical activity that is maintained.

CONCLUSION

The majority of the elderly sleep quality is poor. Physical activity correlates with the quality of sleep among the elderly who are still working. The level of physical activity can affect the sleep quality of the elderly who are still working. For further researchers, it is hoped that they can find an effective method to regulate the pattern of physical activity regularly so that the sleep quality of the elderly who are still working can be better.

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