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BODY MASS INDEX, PHYSICAL ACTIVITY STATUS, AND SLEEP DURATION OF ELDERLY

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Abstract

Regular physical activity by vulnerable populations such as the elderly can improve physical and mental function and reduce the risk of dementia. However, awareness of doing physical activity is still low among the elderly, especially in the city of Bandung. Therefore, this study aims to determine the level of physical activity, BMI, and sleep duration of the elderly in the city of Bandung. This study used a quantitative descriptive method without a control group and assessed the level of physical activity using the International Physical Activity Questionnaire. The results of this study indicate that the average (SD) age, height, weight, and BMI of the study subjects were 56.88 ± 5.32 years, 155.8 ± 7.66 cm, 66.84 ± 12.46 respectively kg, and 27.8 ± 3.8 kg/m2. Meanwhile, the average physical activity status and sleep time of the research subjects were 452.68 ± 76.88 METs, and 344.48 ± 46.28 minutes, respectively. The conclusion of this study shows that the elderly in Kiaracondong District, Bandung City, West Java Province have a low level of physical activity and are in the category of obesity or overweight. However, the resulting sleep duration is still included in the recommended category.

Keywords: Elderly; Physical Activity; West Java

INTRODUCTION

Pysical activity is generally identified as a part of protection against non-communicable diseases such as chronic diseases such as hypertension, cardiovascular disease, stroke, diabetes, osteoporosis, several types of cancer, and others (Celis-Morales et al., 2017; Pantelić et al., 2012). In addition, physical activity that is carried out regularly, gradually, and continuously has a positive impact on increasing cardiovascular, vascular, and respiratory capacity in the general population (Avila-Palencia et al., 2019; Bahri et al., 2021; Wen et al.,

2019). Meanwhile, regular physical activity by vulnerable populations such as the elderly can improve physical and mental function and reverse some of the effects of cardiovascular disease and dementia. In addition, the physical activities carried out can keep the elderly moving and become more independent (Crespillo-Jurado et al., 2019; Ferrari et al., 2013; Seo et al., 2021).

Despite the widely publicized benefits of physical activity, the majority of older adults generally do not meet the minimum level of physical activity required to maintain good health. Previous research stated that the elderly in Serang City, Salatiga City, Sukoharjo Regency have a tendency to have a low level of physical activity (Anugrah et al., 2021; Baga et al., 2017; Nisa & Jatmiko, 2019). The same thing happened in several other countries such as Serbia and Korea which stated that the elderly in these countries had a low level of physical activity (Kostić et al., 2011; Pantelić et al., 2012).

The low physical activity carried out by the elderly is due to the fact that they spend more energy on daily household activities than doing physical activities. In addition, the development of the digital era and the internet at this time is so massive that everything can be done more easily and practically, thus supporting work to be completed more quickly. However, this convenience has a negative impact on the level of physical activity which decreases in the elderly.

The low level of physical activity in the elderly population significantly increases the risk of obesity or overweight. Being overweight in the elderly has serious health impacts such as urinary incontinence, diabetes, cardiovascular disease, arthritis, hypertension, and several types of cancer (Amarya et al., 2014). In addition, the lack of sleep duration in the elderly, especially under certain conditions, can cause digestive disorders which are closely related to overweight in the elderly population.

Physical activity levels are commonly utilized as a metric to assess and appraise public health, and are invariably correlated with an individual's health status. The monitoring of physical activity levels is of great significance as it

serves to forestall sundry illnesses and sedentariness, whilst decreasing mortality rates among the elderly population. Several studies regarding the level of physical activity have been conducted on college students several times (Gunawan et al., 2019; Sunadi & Permana, 2017), and school children (Hasan, 2020). However, research on the level of physical activity in the elderly and the duration of sleep in the elderly as another important parameter is still limited, especially in the city of Bandung.

According to the described research background, it is imperative to determine the physical activity level, BMI, and sleep duration of elderly individuals residing in the city of Bandung. Such information would enable the development of programs and recommendations for relevant stakeholders regarding the significance of physical activity awareness, particularly in the elderly population.

METHOD

The respondent criteria used were the elderly with an age range of 50-65 years who came from the Kiaracondong District, Bandung City, West Java Province. A total of 60 respondents were successfully taken in this study and are expected to provide an accurate description of the characteristics of the elderly in the region.

This research was conducted from April to June 2022. A purposive sampling technique was used to recruit respondents with the respondent criteria used being elderly people with an age range of 50-65 years who come from the Kiaracondong District area of Bandung City, West Java Province. A total of 60 respondents were successfully taken in this study and are expected to provide an accurate description of the characteristics of the elderly in the region. Prior to data collection, research participants were given written consent as the main requirement. The research protocol was also approved by the Health Polytechnic Health Research Ethics Commission, Ministry of Health, Bandung (No.

06/KEPK//EC/XII/2022). So that the steps taken in this study have met the ethical and legal standards that apply in the field of scientific research.

Equation and formula

The International Physical Activity Questionnaire (IPAQ) was employed as the research instrument in this investigation, and this was used in conjunction with anthropometry, which included height, weight, and body mass index. The outputs of the IPAQ questionnaire were represented by Metabolic Equivalent (METs) values, which encompassed three distinct criteria, namely low, medium, and high levels of physical activity. Insufficient physical activity was represented by MET values of less than 600, whilst moderate physical activity was characterized by MET values within the range of 600 to 3000. Higher levels of physical activity were denoted by MET values that exceeded 3000. Height was measured utilizing digital scales and a stadiometer.

The Body Mass Index (BMI) was measured using the BrianMac Sports Coach formula, which takes into account both height and weight (kg/m2). The data collected was subjected to analysis using the One Sample T-Test statistical technique with a 95% confidence interval, and the SPSS version 22 software was employed for this purpose. Thus, the use of accurate and tested research methods and instruments has been carried out to ensure the integrity of the data obtained, so that the research results can be relied upon in drawing conclusions and recommendations.

RESULT AND DISCUSSION
Result

In this result, we get data about age, height, weight, body mass index, physical acitivity and sleep duration. This mean (SD) of age, height, weight, and BMI of the study subjects were 56.88 ± 5.32 years, 155.8 ± 7.66 cm, 66.84 ± 12.46 kg, and 27, respectively. 8 ± 3.8 Kg/m2 shown in table 1.

Table 1. Profiling Subject

No	Variable	Results
1.	Age (years)	56,88 ± 5,32
2.	Height (cm)	155,8 ± 7,66
3.	Weight (kg)	66,84 ± 12,46
4.	Body Mass Index (BMI)	27,1 ± 3,8

Table 2 shows the average physical activity status and sleep time of the research subjects, respectively 452.68 ± 76.88 METs, and 344.48 ± 46.28 minutes.

Tabel 2. Physical Activity and Sleep Duration

No	Variable	Results
1.	Physical Activity (METs)	452,68 ± 76,88
2.	Sleep Duration (minute)	344,48 ± 46,28

Discussion

The primary objective of this study was to ascertain the physical activity status, anthropometry, and sleep duration of elderly individuals residing in a sub-district within Bandung City, located in the West Java Province. To the author's knowledge, this is the first measurement conducted on the elderly in the area and is expected to provide an accurate picture of the characteristics of the elderly in the area. In the research that we have done, the participants who were the subject of this study had an average age of 56.88 ± 5.32. According to data released by the World Health Organization (WHO) and the Ministry of Health of the Republic of Indonesia (Depkes RI), this age is included in the elderly category. In addition, we found that the participants' BMI was at 27.8 ± 3.8, which according to the WHO and the Indonesian Ministry of Health was in the overweight or obese category.

Our findings are in line with previous research which stated that BMI elderly in Serang City tended to be overweight or obese (Anugrah et al., 2021). This confirms that the elderly in big cities in West Java and Banten are in the overweight or obese category. Moreover, the outcomes of our study exhibit notable similarities with those of prior research endeavors that explored the prevalence of obesity among elderly individuals in several developing nations. A previous study revealed that the elderly population in such countries exhibited an average body mass index (BMI) of 27.8, signifying a high prevalence of obesity in this demographic (Jésus et al., 2017; Pantelić et al., 2012).

The findings in our study show differences from several previous studies that examined elderly populations in several developed countries. Several of these investigations arrived at the determination that elderly individuals in developed nations possessed a body mass index that falls within the normal range, and are not considered obese obese (Masood & Reidpath, 2017; Tarui et al., 2020). This phenomenon may be attributable to the increased awareness and knowledge regarding nutrition, health, and healthier lifestyles that exist in developed nations (Hutapea & Intelegence, 2013; Masood & Reidpath, 2017; Tarui et al., 2020).

However, the results from our study suggest that there is a prevalence of obesity in the elderly population in the countries we studied. This emphasizes the importance of studying the factors that contribute to the problem of obesity in the elderly population, as well as formulating appropriate interventions to prevent and treat this problem. Conducting an examination of the factors that contribute to the issue of obesity or being overweight is crucial due to the fact that obesity is a public health concern that can lead to various disease complications and represents a risk factor for the development and mortality of several ailments. Obesity has the potential to trigger cardiovascular disease, metabolic disorders, respiratory difficulties, and cancer (Jésus et al., 2017).

Increasing the role of the central and regional governments in dealing with obesity rates in the elderly population is very important to achieve a healthy life

expectancy in old age. This action aims to prevent the emergence of various diseases due to obesity which can interfere with quality of life. This is realized by the Central Government in Law number 11 of 2022 concerning sports article 4 which states that the purpose of sports is to maintain health, improve fitness levels, and improve the quality of Indonesian people, including the elderly. In addition, previous study that adapted the copy from Article 19 of Law number 11 of 2022 it is stated that types of community sports can be carried out by all levels of society with the aim of maintaining health, recovering from illness, and maintaining to improve the degree of fitness and body health (Bahri et al., 2021; Kamaludin et al., 2020; Nuriman et al., 2016). Whereas the Regional Government of West Java in West Java Province Regional Regulation Number 1 of 2015 concerning the implementation of Sports article 3 states that the purpose of organizing sports in the West Java region is to support the achievement of sports goals nationally in accordance with the mandate of Law number 11 of 2022 concerning sports. In addition, previous study that adapted the copy from West Java Provincial Regulation Number 1 of 2015 article 3 is to popularize sports which is reflected in the people of West Java who know, understand, understand, do, and enjoy the benefits of doing sports or physical activity (Juniarto et al., 2022; Rubiana et al., 2019).

Additional findings from our study revealed that the elderly participants exhibited low levels of physical activity, as evidenced by a MET value of 452.68 ± 76.88. These findings exhibit parallels with earlier research conducted in Serang City (Anugrah et al., 2021), Salatiga City (Baga et al., 2017), and Sukoharo Regency (Nisa & Jatmiko, 2019) which indicated that the elderly population there demonstrated similarly low levels of physical activity, and in line with research conducted in Portugal to 83 elderly (Jésus et al., 2017). Numerous studies conducted in Serbia and Korea have indicated low levels of physical activity among their respective elderly populations (Kostić et al., 2011; Pantelić et al., 2012). Nevertheless, the results of our study diverge from the outcomes of studies

conducted in Japan, which suggested that elderly individuals in Japan tend to display high levels of physical activity, as indicated by a MET value of 1200 (Ishihara et al., 2022; Tajima et al., 2018).

The high METs score of elderly people from Japan is due to intervention by the Japanese government. In reducing obesity rates and increasing physical activity in the elderly, the Japanese state through the Ministry of Health and Welfare carries out an intensive lifestyle intervention policy in the context of annual health checks. The implementation of this measure served as an economically viable preventive strategy against disorders linked to obesity, while concurrently facilitating the identification of target groups at greater risk of weight gain (Tajima et al., 2018; Tarui et al., 2020).

Overall, it can be inferred that the elderly population exhibits lower scores for physical activity compared to other demographic groups (Pantelić et al., 2012; Tomioka et al., 2011). The elderly's low physical activity levels may be attributed to the fact that they expend a greater amount of energy on daily household activities such as laundry, dishwashing, ironing, and other similar tasks, with only a minor portion of their energy being allocated towards physical activity. This is particularly important to note given that low physical activity has been associated with a comparable risk of death from diseases such as high blood pressure and obesity. Therefore, it is necessary to take appropriate actions by related parties to increase physical activity in the elderly in the city of Bandung so that the risk of disease can be minimized.

Other results in our study showed that the sleep duration of the elderly who were the subjects of the study was 344.48 ± 46.28 minutes. According to guidelines issued by the Ministry of Health, ages 40-60 years need around 7 hours of sleep per night. Our research shows that the average elderly sleep for 6.5 hours, almost close to the recommendation from the Ministry of Health. Sleep deprivation among the elderly can result in obesity or being overweight, elevate

stress levels, reduce cognitive function, and worsen overall physical health conditions (Kemenkes RI, 2018).

Various studies have emphasized the crucial role of physical activity in preventing diseases and promoting physical and cognitive health. Moreover, the quality of life of the elderly is dependent on factors such as engaging in physical activity, experiencing life satisfaction, and having strong social connections (Ferrari et al., 2013; Mayer et al., 2011; Meng et al., 2017). Several researchers have demonstrated that consistent participation in physical activity, engagement in recreational activities, sleeping for 7-8 hours each day, and maintaining a body mass index (BMI) within a healthy range that is neither underweight nor obese are key factors that predict a healthy lifestyle and an increased lifespan (Neikrug & Ancoli-Israel, 2013).

The phenomenon of low physical activity and high levels of obesity in the elderly in Bandung City which was revealed in this study should be taken into consideration by related parties, such as the Health Service and agencies dealing with the elderly in Bandung City and West Java Province. This action needs to be taken to pay attention to these conditions and find the right solution to improve the health and quality of life of the elderly, so that the life expectancy of the elderly can increase.

CONCLUSION

The study findings and discussion lead to the conclusion that the elderly residing in the Kiaracondong District of Bandung City, West Java Province, have a low level of physical activity and fall within the obese or overweight category. However, the resulting sleep duration is still included in the category recommended by the Ministry of Health of the Republic of Indonesia and WHO. To ensure the clinical relevance of this specialized field, further research is necessary to expand the sample size and include all elderly individuals in the city of Bandung. This will provide a more comprehensive understanding of the characteristics of the elderly populationt.

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