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The Relationship Between Height, Weight, Body Mass Index and Uric Acid in The Elderly Community

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Abstract: The elderly population continues to increase every year. Efforts to improve the quality of life of the elderly are carried out by the government and society. Empowering the elderly community through posyandu and community associations is useful for improving the health status of the elderly. Every month a health check is carried out, but no research has been carried out regarding the checks carried out. The aim of the research was to determine the relationship between height, weight, body mass index and uric acid levels in the elderly. The research method is a cross-sectional study design. The research was conducted at the Cerbonan Karanganyar elderly community. Data collection was done using purposive sampling. The number of respondents was 51 elderly. Instruments use starter meters, weight scales, auto check tools and uric acid strips. The data analysis technique uses the Pearson correlation technique. The results of the research show that the majority of elderly people are female, 43 (83%). The elderly group aged 60-69 years are the largest community members, 40 (78.4%). There is a positive and significant correlation between height and weight (r=0.443, p=0.001, CI: 0.191-0.640), height and uric acid (r=0.359, p=0.010, CI: 0.093-0.578), height body mass index (r=0.446, p=0.001, CI: 0.194-0.642), body weight with gout (r=0.328, p=0.019, CI: 0.058-0.554), body mass index with gout (r =0.329, p=0.019, CI: 0.058-0.554).

Keywords: Elderly; BMI; Height; Uric Acid; Weight

Introduction

The number of elderly populations continues to increase. In 2050, the number of world residents aged 60 years and over is expected to increase to 2.1 billion from 1.4 billion in 2020. Since 2021, Indonesia has entered an aging population structure, where around 1 in 10 the population is elderly (Susanty et al., 2022). In the face of increasing overall longevity, high rates of obesity in elderly individuals (age ≥ 65 years) and increasing awareness of the health and functional impacts of obesity (Friedenreich et al., 2021; Raud et al., 2020), it is evident that deliberate weight loss in obese elderly individuals is safe. It is appropriate that the increase in the number of elderly people is also accompanied by an increase in the quality of life (Kruse et al., 2020; Şahin et al., 2019; Xu et al., 2019).

In order to improve the quality of life of the elderly, the government has implemented various preventive, promotive, curative and rehabilitative efforts (He & Tang, 2021; Rosita et al., 2023). One form of effort made is to facilitate the empowerment of the elderly community through elderly posyandu. Community empowerment through elderly posyandu is carried out from, by and for the elderly community itself (Hidayati et al., 2023; Rohana & Husin, 2023). Posyandu is also included in one of the variables in the elderly empowerment model in using free time to improve the quality of life (Alberta et al., 2023; Nurhidayah & Puspitosari, 2022, 2023). Posyandu activities for the elderly are routinely carried out every month (Ariani, 2020; Permata, 2020). Prevention of non-communicable diseases in the elderly can be done with routine health checks which are usually carried out at posyandu. Regular health checks are measurements of height, weight, blood pressure and other additional tests such as mental status checks, blood sugar, uric acid and cholesterol checks.

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In the Cerbonan Karanganyar area there is an elderly association or elderly community as a forum for elderly people to carry out activities. Every month we regularly carry out activities. Activities carried out include regular monthly meetings, counseling, gymnastics, recreation, spiritual activities and others. Sometimes examinations are carried out at the health center. Even though they carry out routine activities and even carry out health checks, there has never been any research on the relationship between the variables in the health check. Therefore, research will be carried out on the relationship between height, weight, BMI and uric acid in the Cerbonan Karanganyar elderly community.

Method

The research was conducted with a cross-sectional study design. The research was conducted at the Cerbonan Karanganyar elderly community on May 22 2023. Data was collected using purposive sampling. Inclusion criteria: someone aged 60 years or over, taking part in activities in the community, able to communicate well and willing to be a research sample. The number of respondents was 51 elderly. Instruments use starter meters, weight scales, auto check tools and uric acid strips. The data analysis technique uses the Pearson correlation technique. The flow of research can be seen in Figure 1.

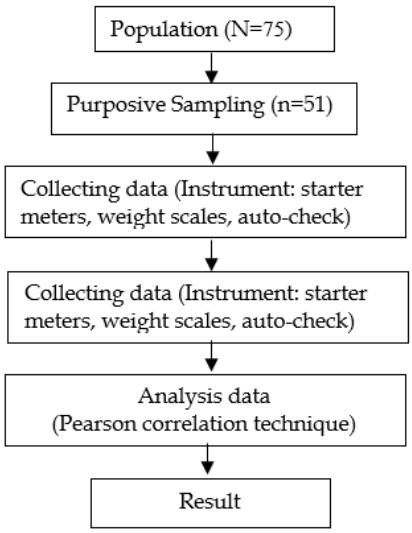

Figure 1. The Flow of research

Result and Discussion

Research shows that 43 (84%) women dominate the Cerbonan Karanganyar elderly community. This data is in accordance with national population data (BPS, 2022) that there are more elderly women (51.81 percent) than men (48.19 percent). The distribution of elderly people in the Cerbonan Karanganyar elderly community can be seen in Figure 2.

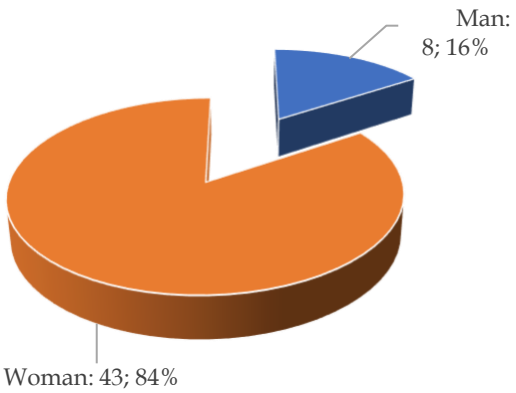

Figure 2. Distribution of the elderly based on sex

The elderly in the Cerbonan Karanganyar elderly community have 3 age groups including the elderly (60-69 years), the middle elderly (70-79 years) and the elderly (>80 years). The elderly group (60-69 years) constitutes the largest number of community members, 40 (78.4%) among the other groups. Age group data shows that the higher the age group shows a decrease in numbers. This shows that there are still very few elderly people who reach old age even though the life expectancy rate shows an increase every year. Therefore, various efforts need to be made to ensure that the increase in the elderly population is in line with improving the quality of life. The distribution of the elderly age group can be seen in Figure 3.

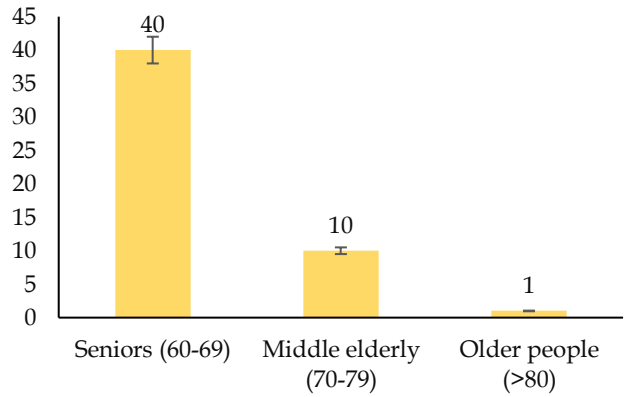

Figure 3. Distribution of the elderly based on age

Height and weight can be used to measure Body Mass Index. Body mass index classification criteria according to WHO (2016) include: thin (<18.5), normal (18.5-24.9), fat (25-29.9), and obese (>30). The Body Mass Index of the elderly in the Cerbonan Karanganyar community can be seen in Figure 3. The Body Mass Index of the elderly is known to be that most elderly

people have a body mass index in the fat category (25-29.9) of 22 (43%).

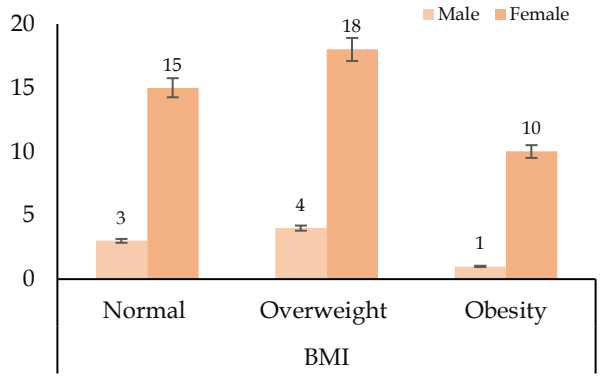

Figure 3. Classification of respondents' body mass index

Approximately 35% of US adults aged 65 years and over between 2007-2010 were obese (Benn et al., 2018). Body mass index increases with age due to the expansion of fat mass and a decrease in spinal height (McKee & John, 2021).

Table 1. Data Descriptive

Variable	Range	Min	Max	Mean	Std. Deviation
Body weight	36	39	75	59.84	8.10
Body high	30	140	170	14.,73	6.59
BMI	16	17	33	26.57	3.65
Uric acid	9	4	12	7.75	2.06

Based on descriptive data on Table 1, it is known that the average weight of elderly people is 59.84, height 149.73, BMI 26.57 in the overweight category, and uric acid level 7.75 in the gout disorder category. The results of data analysis show a relationship between height, weight, body mass index and uric acid in the elderly in the Cerbonan Karanganyar elderly community. The results of the Pearson correlation analysis are shown in Table 2.

Heymsfield & Wadden (2017) stated that obesity causes an unfavorable physiological condition due to changes in insulin resistance, sex hormones, environmental growth factors, increased blood lipids and the formation of various adipokines, including inflammatory cytokines, for example tumor necrosis factor-α and interleukin-6. Obesity can exacerbate age-related decline in physical function (Kong et al., 2020; Morgan et al., 2020). Daily activities, especially mobility, are greatly reduced in overweight and obese people (Izquierdo et al., 2021; Tay et al., 2019). As a result, increasing body fatness is a serious risk factor for metabolic diseases, for example metabolic disease (Sarma et al., 2021). cardiovascular disease (especially heart disease and stroke), diabetes and some types of cancer (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney and colon). The risk of these non-communicable diseases increases as BMI increases, and currently, overweight and obesity are associated with more deaths than underweight in a global perspective (Lauby-Secretan et al., 2016).

Table 2. Results of Pearson correlation analysis

Variable	r	Sig. (2-tailed)	CI 95%	
			Lower	Upper
Body Weight - Height	0.443	0.001	0.191	0.640
Body Weight - Gout	0.328	0.019	0.058	0.554
Height - Gout	0.359	0.010	0.093	0.578
Height - BMI	0.446	0.001	0.194	0.642
BMI - Uric acid	0.329	0.019	0.058	0.554

Iftikhar et al. (2023) explained that obesity is also associated with sleep disorders, breathing difficulties, joint and mobility problems, as well as social stigma. Orwoll et al. (2020) also explained that changes in body composition of some elderly people face increased health risks due to excessive obesity and decreased muscle mass. Insufficient physical activity and unhealthy eating patterns cause an increase in obesity and overweight (Oddo et al., 2019).

The prevalence of hyperuricemia reaches 20% in developed countries such as the United States (Chen-Xu et al., 2019; Li et al., 2020). Hyperuricemia can be caused by increased consumption of foods high in purine and disturbances in uric acid excretion (Benn et al., 2018). Hyperuricemia can predict the development of metabolic syndrome, diabetes, hypertension, kidney disease, and cardiovascular disorders (Soltani et al., 2013).

Bearing in mind that excessive body weight and uric acid levels in the elderly have an adverse impact, preventive, promotive and curative efforts are needed so that elderly people who are overweight and uric acid levels can lead a healthy lifestyle so as to avoid various kinds of accompanying diseases in the future elderly.

Conclusion

Research shows that there is a relationship between height, weight, body mass index and uric acid levels in the Cerbonan Karanganyar elderly community. Preventive, promotive and curative efforts need to be carried out so that elderly people can live healthy, productive and happy lives in their old age.

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Author Contributions

Conceptualization, N.N and A.P. All stages of completing this article were carried out together.

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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