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BODY FAT AND VISCERAL FAT AMONG MARRIED MAN AND WOMAN IN RURAL SOCIETIES

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Abstract. High levels of body fat and visceral fat are the causes of metabolic disorders which are influenced by several factors, including gender. Good social economic condition has brought many changes in the food choices and eating behaviors among married man and woman in rural societies. This shift around nutrition has given rise to Body Fat dan Visceral Fat level which is lead to degenerative illness. Considering this condition, the present study was planned to 1) determine the differences of Body Fat and Visceral fat among married Man and Woman and 2) Find the relationship between the Body Fat with Visceral Fat among Man and Woman. A total of 34 Karang Tengah Villagers 15 Men, 19 women, 18-30+ years from all over the village were voluntary joining the study. Verbal Inform concern was obtained, a self-administered questionnaire was given, and the Body composition were measured by bio-electric impedance analysis device. Data were analyzed using SPSS – 23. The results indicated that Body Fat average in Man were lower than Woman with 21,28% and 39,25%, respectively (p-value 0.000). But different result showed in Visceral Fat, Men were Higher than Women, 10,4 and 7,26, respectively (p-value 0.028). Significant positive correlations were found among Body Fat and Visceral Fat level in both Men (r 0,977, p-value 0,000) and Women (r 0,971, p-value 0,000). Findings of present study suggest that there is need for coordinated efforts to reduce the prevalence of high percentage Body Fat and Visceral Fat and to develop healthy eating behaviors among Villagers.

Key Words*:* - Body Fat; Visceral Fat, Bioelectric Impedance Analysis, Rural Societies

INTRODUCTION

Levels of body fat and visceral fat are the causes of metabolic disorders which are influenced by several factors, including gender. Metabolic disorders due to levels of body fat and levels of visceral fat have an impact on the emergence of various degenerative diseases such as stroke, coronary heart disease and obesity, the prevalence of which has reached alarming numbers, which is about 13% of the adult population in the world and has nearly tripled since 1975 (WHO, 2020). Obesity not only increases the risk of hypertension, but also positively associated with the presence of metabolic syndrome, dyslipidemia, systemic hypertension, and insulin resistance, associated with an increased risk of Cardiovascular Diseases (CVD) and is the number one cause of death in the world (Cornier et al, 2008), (Mottilo et al, 2010).

Since 1964, studies on body fat levels have been carried out. In that year, body fat was measured using a large tube to scan the body's potassium levels using gamma rays. Fat content is calculated using the formula for potassium content scanned by gamma rays. The gamma ray tube is very large, expensive, difficult to apply and not easy to be transferred (Christian et al, 1964). Technological developments to measure body composition not only focused on body fat levels but starting to measure other body components such as visceral fat, protein, bone density and body fluids. In the early 1990s the use of Bioelectrical Impedance Analysis (BIA) to measure body composition was being developed. The latest developments in BIA technology are believed to be valid, reliable, safe, simple, and non-invasive compared to other techniques for estimating body composition (Lee et al, 2020), (Kida et al, 1999), (Ataie et al 2020). The ease of data collection using BIA makes studies of body fat levels and visceral fat levels have been widely carried out. Research on body fat levels and visceral fat levels in various groups of people such as people with high obesity or people with nervous anorexia have been carried out in several countries, also in people with COVID 19 (Mahzan et al, 2021), (Moonen et al, 2020) (Marra et al, 2018). Likewise, research on visceral fat and fat content in Indonesia has been carried out on late adolescent groups (Iskandar, 2016) (Akbar, 2017).

Research on body fat and visceral fat that takes gender into account in married rural groups has never been conducted. This is important to know because both men and women generally gain weight and tend to be obese after marriage. For this reason, the researchers wanted to know the differences in

body fat levels and visceral fat levels in married men and women in rural areas.

METHOD

Participants

A total of 34 residents from all regions in Karang Tengah Village participated in the research voluntarily. Each participant is informed about the details of the research at the meeting conducted before the research. Each participant expressed approval to participate in the study verbally. The research was conducted during the Covid 19 pandemic in Indonesia. Due to the Covid 19 pandemic, research needs to obtained permission from the Government by implementing Health Protocols such as limiting the number of participants, Wearing Masks, Washing Hands and giving hand sanitizer to participants. Participants in this study consisted of men (n = 15) and women (n = 19) aged between 23 years to 56 years with an average of 36,617 ± 1.50, height ranging from 139 cm to 173 cm with an average of 155.28±1.31.

Methods

All participants had one session of measurement conducted at a temporary testing facility at Karang Tengah Village Office. Each participant completed a demographic questionnaire in a seat that has been arranged in such a way with a minimum distance of 1.5 m between seats. Participants were then called one by one to take height measurements. So that there is no accumulation of participants in one measurement post. After the participants completed the measurement of height then participants took a body composition measurement to measure Body Fat and Visceral Fat. All measurements are performed by the same measurement team that has been given prior training.

Height measurement using wall mounted height stature meter (SH2A, GEA Medical, Jakarta, Indonesia) is recorded with a precision of close to 0.5 cm. Before the measurement, participants were instructed to take off their footwear and then put it on the floor. Participants were instructed to take a breath and then hold their heads up when height measurements were performed. Body Fat and Visceral Fat are measured using Bioelectrical Impedance Analysis that has been known to be valid and reliable (Xiaomi Mi Body Composition Scale 2, Xiaomi Corporation, Beijing China). Measurement is recorded closest range from 0.1 and 1. Participants are instructed to remove the footwear before this measurement so that the soles of the feet come into direct contact with the electrodes on the body composition scale but can wear modest clothing.

Statistical Analysis

After all the data is collected, the data is inputted into a form that has been provided. Descriptive statistics (min, max, mean, and standard deviation) for each indicator are calculated. Independent student t-test is conducted to find out the difference in body fat and visceral fat levels between men and women. All data is visualized and plotted using an Estimation Curve. After this, Pearson correlation tests are conducted to determine association between body fat and visceral fat. All statistics analysis using SPSS software version 26.

RESULTS AND DISCUSSION

Descriptive statistics and analysis of mean differences between gender from values obtained through BIA are shown in Table 1. The number of participants, mean values, standard deviation and error standards are calculated to know the description of the participant's overview. Furthermore, an analysis of the mean differences from several factors was performed to verify the differences in indicators in the gender group. Based on this analysis, we can observe that not all factors indicate homogeneity between man and woman.

Table 1.
Distribution of Age, Body Fat and Visceral Fat among Married Man and Woman

	Sex	N	Mean	P Value
Age	Man	15	37,33	
	Woman	19	36,05	0,679
Body Fat	Man	15	21,28	
	Woman	19	39,25	0,000
Visceral	Man	15	10,40	
	Woman	19	7,26	0,028

This research on married groups in rural societies has shown that there are differences in the levels of body fat and visceral fat in men and women. It is different from research regarding the levels of body fat and visceral fat in the late adolescent group in Indonesia which shows no difference ((Iskandar, 2016) (Akbar, 2017).

This study confirms that there is a tendency for changes in diet when someone is married which lead to differences in fat deposit in man and Woman. According to research conducted by Mata et al 2015 in 9 European countries and by Windasari et al 2019 in Indonesia (Mata et al, 2015), (Windrasari, 2019) shown that marriage effect the diet pattern and tend to have fatter deposit in the body. Furthermore, Windasari stated that for people with middle to lower socioeconomic conditions, though being obese is proof of the

success of marriage because it is a symbol of welfare.

Research in America in the military group states that pattern of diet largely determines body fat levels and visceral fat levels which in turn affect fitness. The worse the diet, the worse the body composition, so the worse one's fitness. (Jayne et al, 2021). Besides having an impact on fitness, research in Algerian shows body fat levels also have an impact on a person's balance and mobility. (Zerf, 2017). It is in line with research conducted in China by Wang et.al showing a correlation between visceral fat and body fat (Wang et al, 2018).

One way that can be done to reduce body fat levels and visceral fat levels is to adopt an active living (Kvintova and Sigmund, 2016). Active living is a way of life that integrates physical activity into everyday routines, such as walking to the store or biking to work. Active living is a combination of physical activity and recreation activities aimed at the public to encourage a healthier lifestyle. As one of the most important issues the communities is a staggering increase in the rates of obesity and chronic disease. Active Living offers an opportunity to address these health concerns by helping people have a physically active lifestyle. Communities that support active living gain health benefits, economic advantages, and improved quality of life. It is easy to incorporate your daily routine into active living. Activities such as normal household chores can fit into, and it is simple enough to switch to using the stairs instead of taking the elevators at work.

CONCLUSIONS

This study shows that body fat and visceral fat as an indicator of body quality in married group of rural societies is influenced by gender. BIA can be used as a measuring tool for body fat and visceral fat that has a strong relationship both in married man and woman. Active living is one way that can be done to reduce body fat levels and visceral fat levels.

DECLARATION OF INTERESTS STATEMENT

The authors declare no conflict of interest.

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