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The Relationship between Obesity and Joint Injury History and Arthritis Incidence at Productive Age (15 – 59 Years) at West City Health Center in 2026

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ABSTRACT

Arthritis is an inflammatory condition in the joints that can cause changes in bone position, accompanied by swelling, pain, stiffness, and limited movement, which are influenced by various factors including obesity and a history of joint injuries. This disease is one of the non-communicable diseases whose prevalence continues to increase and now occurs in many productive ages. In Gorontalo City, the number of arthritis cases increased from 2,769 cases in 2023 to 2,992 cases in 2024, with 87.79% of sufferers being of productive age. Therefore, this study aims to determine the relationship between obesity and history of joint injuries and the incidence of arthritis at productive age (15–59 years) at the West City Health Center in 2026.

This study uses an observational analytical method with a cross-sectional design. The population in this study is patients of productive age at the West City Health Center, with a sample of 87 respondents selected using accidental sampling techniques. Data was collected through questionnaires, then analyzed using the chi-square test.

Results showed a significant relationship between obesity (p=0.001) and history of joint injury (p=0.026) and the incidence of arthritis.

The conclusion of this study is that obesity and a history of joint injury have a significant relationship with the incidence of arthritis at productive age at the West City Health Center in 2026. Thus, prevention efforts through weight control, increased physical activity, and proper handling of joint injuries need to be carried out to reduce the risk of arthritis occurrence at productive age.

INTRODUCTION

Arthritis is an inflammatory condition in the joints that can cause changes in bone position, accompanied by swelling, pain, stiffness, and limited movement (Platini et al., 2018). The condition is multifactorial, influenced by a variety of risk factors, including genetic, mechanical, environmental, metabolic, and immunological (Firestein, 2003; Hunter & Bierma-Zeinstra, 2019). One of the metabolic factors that plays an important role is obesity, which not only increases the mechanical load on the joints but also triggers the production of inflammatory mediators from adipose tissue (MacDonald et al., 2019). In addition, a history of joint injury as a mechanical factor also contributes to the occurrence of arthritis through structural changes and ongoing inflammatory processes (Richmond et al., 2013; Whittaker et al., 2021).

This disease is one of the non-communicable diseases whose prevalence continues to increase and is not only experienced by the elderly group, but also increasingly occurs in productive age (Asmin et al., 2021; O'Donnell et al., 2015). Globally, in 2019 there were around 18 million people with rheumatoid arthritis and 528 million cases of osteoarthritis, an increase of 113% since 1990 (WHO, 2019). In Indonesia, the highest prevalence of rheumatoid arthritis is found in Bali (22.8%), Aceh (21.3%), and Lampung (14.5%), while osteoarthritis increases with age (Arfinda et al., 2022; Riskesdas, 2018).

Arthritis cases in Gorontalo City have also increased from 2,769 cases in 2023 to 2,992 cases in 2024, with 87.79% occurring in productive age. Data from the West City Health Center in 2025 shows that arthritis is among the top ten most diseases, with 223 out of 405 cases occurring in the productive age group. Research by He et al. (2024) Identify obesity as a major factor contributing to the increased incidence of osteoarthritis. Furthermore, research by Maulani et al. (2018) It shows that a history of joint injury is an important risk factor for arthritis. However, studies that specifically assess these two factors in the productive age group at the primary health service level are still limited.

Therefore, this study aims to determine the relationship between obesity and a history of joint injury and the incidence of arthritis at productive age at the West City Health Center, Gorontalo City in 2026. The results of this study are expected to contribute to understanding the risk factors for arthritis at productive age and become the basis for more appropriate prevention efforts.

METHODS

This research was carried out at the West City Health Center located at Jl. Rambutan, Buladu Village, West Kota District, Gorontalo City, Gorontalo Province, on February 13-23, 2026. This study uses an observational analytical method with a cross-sectional design, which aims to analyze the relationship between risk factors and their impact through observation and data collection at a certain time, so that all variables are assessed at the same time.

The population in this study was patients of productive age (15–59 years) who visited the West City Health Center at the time of the study. The sample of 87 respondents was determined using the Lemeshow formula with a confidence level of 95% and an error rate of 5%, and was selected using accidental sampling techniques, which are based on respondents who were directly met by the researcher and met the criteria as a data source.

The data used consists of primary and secondary data. Primary data were collected through interviews using questionnaires as well as weight and height measurements to determine body mass index. Secondary data was obtained from the Gorontalo City Health Office and the West City Health Center regarding the incidence of arthritis. The research instruments include questionnaires and anthropometric measuring tools in the form of digital scales and microtoises.

Data analysis was carried out univariate to describe the frequency distribution of respondents based on variable characteristics, and bivariate to see the relationship between independent variables and bound variables using chi-square tests.

RESULTS

Table 1. Respondent Characteristics

Gender	**Quantity**	
	n	**%**
Male	35	40,2
Women	52	59,8
Total	**87**	**100**

Age Group	**Quantity**	
	n	**%**
15 – 19 years old (Late teens)	2	2,3
20 – 44 years old (Young adults)	52	59,8
45 – 59 years old (Middle age)	33	37,9
Total	**87**	**100**

Jobs	**Quantity**	
	n	**%**
Not working yet	9	10,3
Day laborers	3	3,4
Housewives	26	29,9
Fisherman	1	1,1
Merchant	10	11,5
Civil servant/TNI/Polri	12	13,8
Private employees	6	6,9
Farmer	9	10,3

Jobs	Quantity	
	n	%
Driver	1	1,1
Not working	4	4,6
Self-employed	6	6,9
Total	**87**	**100**

The characteristics of the respondents showed that of the 87 respondents, most of them were female, namely 52 people (59.8%), while 35 people (40.2%) were male. Based on age group, the most respondents were at the age of 20-44 years as many as 52 people (59.8%), followed by 33 people aged 45-59 years (37.9%), and 2 people aged 15-19 years (2.3%). Based on employment, most of the respondents were housewives as many as 26 people (29.9%).

Table 2. Distribution of Obesity Status by Body Mass Index (BMI) at Productive Age at West City Health Center in 2026

Obesity Status	Quantity	
	n	%
Obesity	44	50,6
Not obese	43	49,4
Total	**87**	**100**

Distribution of Joint Injury History at Productive Age at the West City Health Center in 2026

Have a history of joint injuries	Quantity	
	n	%
Yes	32	36,8
No	55	63,2
Total	**87**	**100**

Distribution of Arthritis Incidence at Productive Age at West City Health Center in 2026

Incidence of Arthritis	Quantity	
	n	%
Arthritis	21	24,1
No Arthritis	66	75,9
Total	**87**	**100**

The results of the univariate analysis showed that out of 87 respondents, there were 44 obese respondents (50.6%) and 43 non-obese respondents (49.4%). A total of 32 respondents (36.8%) had a history of joint injury, while 55 respondents (63.2%) did not have such a history. The incidence of arthritis was found in 21 respondents (24.1%), while 66 respondents (75.9%) did not have arthritis.

Table 3. The Relationship between Obesity and the Incidence of Arthritis at Productive Age at the West City Health Center in 2026

Obesity Status	Incidence of Arthritis				Total		*p-value*
	Arthritis		No Arthritis				
	n	%	n	%	n	%	
Obesity	17	38,6	27	61,4	44	100	**0,001**
Not obese	4	9,3	39	90,7	43	100	
Total	**21**	**24,1**	**66**	**75,9**	**87**	**100**	

Table 4. The Relationship between Joint Injury History and Arthritis Incidence at Productive Age at West City Health Center in 2026

Have a history of joint injuries	Incidence of Arthritis				Total		*p-value*
	Arthritis		No Arthritis				
	n	%	n	%	n	%	
Yes	12	37,5	20	62,5	32	100	**0,026**
No	9	16,4	46	83,6	55	100	
Total	**21**	**24,1**	**66**	**75,9**	**87**	**100**	

The results of the bivariate analysis showed that the incidence of arthritis was more found in obese respondents, namely 17 people (38.6%) compared to 4 non-obese people (9.3%), with a p-value of 0.001 ($p < 0.05$). In addition, the incidence of arthritis was more common in respondents with a history of joint injury as many as 12 people (37.5%) compared to no history of joint injury as many as 9 people (16.4%), with a p-value of 0.026 ($p < 0.05$).

DISCUSSION

The Relationship between Obesity and the Incidence of Arthritis at Productive Age (15 – 59 years) at the West City Health Center in 2026

Based on the results of the study, out of 44 obese respondents, as many as 17 people (38.6%) experienced arthritis. These findings suggest that being overweight may contribute to an increased risk of joint disorders at productive age. Obese respondents who experience arthritis are generally between the ages of 20–59 years and have jobs with physical activities such as long standing, weight lifting, and repetitive movements, which increase mechanical stress on the body's supporting joints. BMI values in this group ranged from 30.0–33.5 kg/m², suggesting that increased body weight causes greater load on the joints and accelerates degenerative damage. In addition to mechanical factors, obesity is also related to metabolic changes through the production of inflammatory mediators that can accelerate the breakdown of joint tissue, as explained by Timofte et al. (2024).

However, as many as 27 obese respondents (61.4%) did not experience arthritis. This shows that obesity does not always directly cause joint disorders, as it is influenced by other factors such as younger age, type of work with low mechanical stress, and BMI at the early limits of obesity. In addition, arthritis was also found in 4 non-obese respondents (9.3%), suggesting that this condition can still occur in normal-weight individuals. Other factors such as repetitive physical activity, injury history, and degenerative processes also contribute to the appearance of arthritis. In contrast, most respondents were not obese, with 39 people (90.7%) not having arthritis, suggesting that normal weight helps maintain a balance of joint load and lowers the risk of damage (Collins et al., 2018).

Overall, the incidence of arthritis is more prevalent in obese individuals than in non-obese individuals, although not all obese people develop arthritis and a small percentage of non-obese people also develop it. This suggests that arthritis is not only affected by obesity, but also other factors such as age, physical activity, type of work, and injury history (Centers for Disease Control and Prevention (CDC), 2024). The results of the chi-square test showed a p-value of 0.001 ($p < 0.05$), which means that there is a significant association between obesity and the incidence of arthritis. These findings are in line with research Maulani et al. (2018) which showed a meaningful association between obesity and osteoarthritis with an Odds Ratio of 2.19, in which obese individuals had a greater chance of developing joint disorders compared to normal weight.

The Relationship between Joint Injury History and Incidence of Arthritis at Productive Age (15 – 59 years) at the West City Health Center in 2026

Based on the results of the study, of the 32 respondents who had a history of joint injury, as many as 12 people (37.5%) experienced arthritis. This suggests that joint injuries can be a factor that plays a role in the development of joint disorders later in life. Damage to joint structures such as cartilage, ligaments, or meniscus during trauma can trigger inflammatory processes and biomechanical changes that develop into arthritis. Respondents with this condition are generally middle-aged and have jobs with high physical activity such as farmers, day laborers, self-employed and housewives, which involve repetitive movements and increase mechanical pressure on the joints. Injuries such as strenuous activity, falls, and accidents, as well as the time of injury occurrence, which is generally 1–5 years before the study, allow for a gradual degenerative process to appear as arthritis, in line with De Roover et al. (2023).

However, as many as 20 respondents (62.5%) with a history of injury did not experience arthritis. This suggests that joint injuries do not always directly cause chronic disorders, as they are influenced by other factors such as younger age, the type of work with low mechanical stress, and the severity and handling of the injury. In addition, some injuries may be mild or have recovered so that joint function is back to normal. This is in line with Hunter & Bierma-Zeinstra (2019) which states that the development of arthritis is influenced by various factors such as physical activity and tissue regeneration ability.

In respondents without a history of injury, 9 people (16.4%) still had arthritis, suggesting that this condition can also be affected by other factors such as age, repetitive physical activity, and type of work. In contrast, most respondents without a history of injury, i.e. as many as 46 people (83.6%) did not have arthritis, which suggests that the absence of trauma helps maintain joint structural stability and lowers the risk of damage.

Overall, the incidence of arthritis was more common in respondents with a history of joint injury than in no injury history. The results of the chi-square test showed a p-value of 0.026 ($p < 0.05$), which means that there is a significant relationship between the history of joint injury and the incidence of arthritis. These findings are in line with research Rahmanto & Aisyah (2019) who reported that individuals with a history of joint trauma had a greater chance of developing osteoarthritis, due to joint instability and a progressive post-injury inflammatory process.

CONCLUSIONS AND SUGGESTIONS

There is a significant relationship between obesity and the incidence of arthritis at productive age at the West City Health Center, as well as a significant relationship between the history of joint injury and the incidence of arthritis. Therefore, it is necessary to maintain an ideal weight through a balanced diet and regular physical activity, as well as prevent injuries by applying safe work and exercise techniques. If there are complaints of persistent joints, an examination to a health facility needs to be carried out as early as possible so that treatment can be provided appropriately.

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