

Factor Analysis With The Event Of Gout In The Community Of Lumban Barat Village

Agustaria Ginting¹, Murni Sari Dewi Simanullang², Graicia Agustina Sihombing³

^{1,2,3} Nursing Study Program, STIKes Santa Elisabeth, Jl. Bunga Terompet NO. 118, Medan, 20131, Indonesia

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ABSTRACT

Gout is a non-communicable disease that occurs due to the accumulation of crystals in the joints, resulting in an increase in gout levels in the body, and attacks the joints causes the joints become swollen, red skin color, a sensation of heat and pain in the joints. The results of the initial survey find 70 people with gout. The purpose of this study is to analyze factors related to the incidence of gout in people aged 30-60 years at Puskesmas area of Lumban Barat village, Paranginan Humbang Hasundutan district in 2021. The research method used is an analytical observational design with a cross sectional design. The gout prevalence is 23.1%, age group 46-60 (63.5%), gender male (36.5%), obese BMI (47.1%), non-good eating pattern (44, 2%). Based on the chi square analysis, it is found that with the results of the chi square statistical test, the age value is p value 0.013, the gender value is p value 0,010, body mass index p value 0.004, eating patterns p value 0.010, which means there is a relationship between age, gender, body mass index, eating patterns, with gout occurrence. The gout proportion in this region is 23.1%. Age, obesity, and not good eating patterns have been shown to be associated with the gout occurrence. In this study, increasing age, gender, obesity, not eating patterns have each opportunity, 2,600, 3,267, 3,286, 3,557 times more to experience gout than subjects who are younger, not obese and have a good diet.

E-mail:
gintingamoz@yahoo.com

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1. Introduction

Gout is a non-communicable disease that can occur due to the accumulation of crystals in the joints, resulting in an increase in uric acid levels in the body, and can attack the joints, especially the joints of the heels, knees, toes and in the hands such as wrists, fingers and elbows. Arthritis is often not realized by people, especially those who are growing up so that in the end it causes complaints of pain, swelling, inflammation, heat, stiffness in the extremities and can even get to the point where the patient cannot carry out activities as usual (Nurhayati, 2018).

The gout prevalence worldwide ranges from 1-4% where the prevalence increases every decade of human life between 11-13% (Singh & Gaffo, 2020). However, the prevalence found by (Chandratre et al., 2018) in the UK at 2.5%, while the research by (Ragab et al., 2017) reports that the gout prevalence in other western countries can reach 3-6%. Research by (Larsson et al., 2018) said that the gout prevalence in the United States is about 10%, the cause of this condition often occurs in adults, and overweight. The increasing incidence of gout in the community can be caused by several risk factors including age, obesity (obesity), lack of exercise, alcohol consumption, unbalanced diet or foods that contain high purine substances such as duck, offal, nuts and belinjo, seafood (Sayekti, 2017).

The Indonesian Health Ministry (2018) proved that the gout prevalence based on a diagnosis from a doctor at the age of ≥ 15 years in all provinces of Indonesia was found to be 13.3%. The prevalence reported above is supported by the results of research conducted in several provinces in the same year, where the gout prevalence in West Java was 8.86%, Central Sulawesi 7.72%, Bali 10.46%, Jambi 8.67 and North Sumatra by 5.3%. Data on the prevalence of uric acid in every province of Indonesia fluctuates greatly (RISKESDAS, 2018). Based on the results of an initial survey conducted by researchers at Paranginan village health center, Humbang Hasundutan Regency, it was found that there were 70 people suffering from gout with an average age of 45 years. The interviews result from several people consumed food groups that contain high purines such as offal and nuts.

The risk factor that often causes gout in humans veins is difficult to change, namely age, and this is proven by (Liu & Tan, 2019) that age is related to the incidence of gout (adds ratio = 1.5). This means that the higher the age, 1.5 times more risky of developing gout compared to the

younger age. In other words, the older a person is the more at risk of developing gout. In addition to the age factor, the gender variable is one of the factors causing gout in the community, as studied (Leokuna & Malinti, 2020) who said that the incidence of gout in the male sex can reach 1-2% compared to adult women.

A study of (Songgigilan & Kundre, 2019) reported that the gout prevalence at Ranotana Weru was 72.4%. From the results of the study, it has been proven that there is a relationship between diet and the incidence of gout. The gout prevalence was significantly higher in respondents with poor eating patterns, which was 76.2%. It can be illustrated that the respondent's diet is not balanced, such as consuming carbohydrates, meat, tofu and tempeh (high in purines) and kale excessive daily consuming. On the other hand, eating foods that are low in purines can reduce gout levels in the blood (Febriyanti et al., 2020). If gout is not treated properly and seriously, it will eventually cause damage to the joints and lead to kidney failure, so that it will cause interference with the function of the organ itself.

The global challenge associated with gout today is obesity. The obesity factor is a condition of excessive fat in the body which will always tend to have high gout levels in the blood (Bai et al., 2021). (Leokuna & Malinti, 2020) research reports that 70 adults in East Oesapa have a gout prevalence of 30%. The number is dominated by obesity by 38.5%. Also obesity in respondents can be caused by low physical activity carried out every day and accompanied by an increase in calorie consumption, this will result in an increase in free fatty acids in plasma and cause insulin sensitivity and insulin resistance (Lubis & Lestari, 2020).

The purpose of this study was to analyze the relationship between age, gender, body mass index and dietary habit with the gout incidence on the people at Paranginan Village, Humbang Hasundutan Regency, North Sumatra Province.

2. Methods

This research is an analytic observational study with a cross sectional design. The subjects included in this study were people with an age range of 30 to 60 years at Paranginan Lumban Barat Village as many as 104 people. Inclusion criteria included respondents who lived at Paranginan Lumban Barat Village and respondents who agreed to be research subjects by signing an informed consent and following all health protocol procedures during the study.

Research data collection is done directly by observation and interviews using questionnaires. The researcher measured the respondents' weight and height using a calibrated GEA brand stamping scale and for measuring the respondent's height using a calibrated GEA brand stature meter by means of the respondent it was recommended not to wear sandals or shoes and the respondent was asked to stand straight in front and the results are recorded on the observation sheet, after completing the weighing and height, the researcher then measures the respondents' uric acid levels using the GCU easy touch tool, where the normal value of uric acid for women is 2-6.5 mg/dL, and men 2-7.5 mg/dL. Diet was measured using a questionnaire consisting of 10 questions about the consumption of foods high in purines.

After all the data was collected, the researcher processed the data with the help of SPSS computerization. Univariate analysis was conducted to identify the variables of age, sex, body mass index, and eating patterns of the respondents. Bivariate analysis using the chi-square test to determine the relationship between each variable studied with the incidence of gout. The significance value used is $\alpha = 0.05$.

3. Results dan Analysis

Based on table 1. It shows that the majority of subjects aged 46-60 years were 66 people (63.5%) while those aged 30-40 years were 38 people (36.5%). Male respondents are as many as 38 persons (36.5%) while women respondents are as many as 66 persons (86.5%). The respondent's body mass index with obesity was found in 51 people (49%) while 54 people (51%). Then bad eating patterns were found in 54 people (51.9%) while good eating patterns were found in 50 people (48.1%). Then the gout prevalence found in respondents at this region was 23.1%.

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TABLE 1
FREQUENCY DISTRIBUTION OF AGE, GENDER, BODY MASS INDEX, AND DIETARY HABIT

Variabel	n	%
Age		
30-45 years	38	36,5
46-60 years	66	63,5
Gender		
Male	38	36,5
Female	66	86,5
Body Mass Index		
Obesity	51	49,0
No Obesity	53	51,0
Dietary habit		
Not good	54	51,9
Well	50	48,1

Based on bivariate analysis it is showed a relationship between age and the incidence of gout (p=0.041 and RP = 2,600, 95% CI: 1,024-8,801), means that the incidence of gout is 2.6 times more likely to occur to those people with an older age than to those younger. There was a relationship between gender and the incidence of gout (p=0.015 and RP=3.266, 95% CI: 1.226-8.803), meaning that the incidence of gout was 3.2 times more likely to occur in male subjects than female subjects. There is a relationship between body mass index and the incidence of gout (p = 0,015 and RP = 3,266, 95% CI: 1,226-8,803) means that the incidence of gout is 3,3 times more likely to occur in obese subjects compared to those without obesity. Furthermore, there is a relationship between diet and the incidence of gout (p=0,010 and RP = 3,667, 95% CI: 1,217-10,205), means that the incidence of gout is 3,7 times more likely to occur in people with not eating patterns compared to those with good eating patterns.

TABLE 2
THE RELATIONSHIP BETWEEN AGE, GENDER, BODY MASS INDEX AND DIETARY HABIT WITH THE INCIDENCE OF GOUT

Variable	The Gout Level				Total		p value	RP (CI=95%)
	High		Normal		n	%		
	n	%	n	%				
Age								
30-45 years old	13	34,2	25	65,8	38	100	0,041	2,600 (1,024-8,801)
46-60 years old	11	16,7	55	83,3	66	100		
Gender								
Male	14	38,8	14	63,2	38	100	0,011	3,267 (1,274-8,376)
Female	10	15,2	56	84,8	66	100		
Body mass index								
Obesity	17	33,3	34	66,7	51	100	0,015	3,266 (1,226-8,803)
Not Obese	7	13,2	46	86,8	53	100		
Dietary Habit								
Not Good	18	33,3	36	66,7	54	100	0,010	3,667 (1,317-10,205)
Well	6	12,0	44	88,0	50	100		

Gout prevalence

Examination conducted by researchers on 104 respondents showed that 23,1% experinced gout, this indicates that this prevalence is quite high compared to other areas. This study is in line with (Leokuna & Malinti, 2020) research which found that the incidence of uric acid was still high among the people. Even according to research results (Fadlilah & Sucipto, 2018) found the incidence of uric acid in the research area was 41%. The research results of (Sueni et al., 2021) said

that the number of gout sufferers from time to time tends to be uncontrolled and always increases. It is proven that gout disease can now be found all over the world, in every class of society. The gout prevalence also tends to enter a younger age and even attacks the productive age which will have an impact on decreasing work productivity.

The metabolism results of human normal body that contain high purines such as offal, nuts under normal circumstances will be excreted through body secretions such as the kidneys in the form of urine, digestive organs in the form of feces, and through sweat. A normal body will process gout products in human blood and can accommodate the results of purine metabolism to a certain level. However, after exceeding that level, our bodies are finally unable to process and dispose of normally so that over time there is a buildup of uric acid in the body which causes dire signs and symptoms in every human being (Arjani et al., 2018).

Lumban Barat Village, Paranginan District is one of ten sub-districts included in the Humbang Hasundutan Regency area, located in the highlands between 1000 - 1500 meters above sea level, totaling 2.181 people. The results of our previous study showed that this area is having a high social life. This affects the lifestyle of the local community. There is a custom in traditional parties in this area to invite relatives and neighbors to rejoice when there is a birth or wedding party and also to mourn if one of them in sadness. A guest is an honorable person so that the party who is having a party or misfortune is obliged to entertain by drinking and eating together, and this has been passed down from generation to generation until now. Food for guests is not strictly limited so that everyone can eat as much as they need or even more. In addition, the weather also supports the consumption of beverages that warm the body with alcoholic beverages such as palm wine. In addition, this area is famous as a producer of nuts which are processed both traditional and modern and marketed at the nearest store and are always available when there is a traditional party taking place. According to the researchers' observations, the above is a supporter of the increasing incidence of gout among the people in this region.

The relationship of age and gout

Based on the research, we found that there was a significant relationship between the respondent's age and the incidence of gout. These results are in line with research by (Fadlilah & Sucipto, 2018). The study illustrates that shows that there is a relationship between age and the incidence of gout. Physiologically, the older the age, the greater the risk of suffering from gout. Increasing age will cause a decrease in function, especially the kidney organs, especially in managing purines in the body. This results in a buildup of gout levels in the body, but it can also be influenced by purine foods that are in excessive consumption or uncontrolled.

The results of the study we conducted we found there are more in the age group 30-45 years where they tend to have higher guot levels than those aged 45 years. (Karuniawati, 2018) in her research found that at a higher age, they experienced more gout. According to other researchers, we believe that younger age can also suffer from gout due to a diet that is too strict or the wrong diet, such as eating foods rich in meat, seafood and fast food, nuts and sweetened drinks, excessive consumption of alcohol, beer, all of which can increase the risk of developing gout.

The relationship of gender and gout

The results of this study revealed that there was a relationship between the sex of the respondents and the incidence of gout. The incidence of gout among males was found to be 38.8%. This study is also supported by the results of research (Leokuna & Malinti, 2020) which discovered that the number of gout events among the males was 43%.

(Fung et al., 2020) and (Lin et al., 2019) in his study, found that there was a significant relationship between the male sex variable and the incidence of gout. It was confirmed that male sex has a positive impact in increasing the incidence of gout. Liu & Tan, (2019) stated in his research that the male sex played an important role in causing gout among the respondents, where the p value = 0.001, the OR was 2.133. It can be proven that male respondents have a 2.1 times risk of suffering from gout compared to female respondents.

The increase in the incidence of gout in male respondents is closely related to dietary patterns by consuming excessive purine compounds such as offal, nuts, and alcoholic beverages (Febriyanti et al., 2020)

The relationship of body mass index and gout

Based on the results of the study, it was found that there was a significant relationship between BMI and gout occurrence. Evans et al., (2018) also found a relationship between obesity and the incidence of obesity with gout with an RR value of 2,24 (95% CI:1,76-2,86). This means that respondents who have a body mass index are obese 2,2 times more likely to suffer from gout than respondents with normal weight. Furthermore, it is said that people who are obese trigger gout more quickly than those with normal weight. A similar relationship has also been shown in other studies with adults where obese people have an increased risk of developing gout (Nguyen et al., 2017).

Obesity is one of the most important risk factors to consider in an effort to control the gout occurrence. The problem of obesity currently occurs in all age groups, including at various socioeconomic levels. Obesity is a serious problem and is a risk factor for various metabolic and degenerative diseases. Overweight and obesity experienced in childhood may become obese when growing up and eventually have the potential to experience degenerative diseases in the future, including gout (Kementerian Kesehatan RI, 2019). Bad obesity in a person is often influenced by poor eating patterns in society such as consuming fatty foods, sweet foods, eating fewer vegetables, and less activity. Efforts can be made to suppress this phenomenon through health promotion or by conducting the Nusantara movement program to reduce obesity through measuring body mass index such as body weight, abdominal circumference and height. Furthermore, risk behavior interviews can be carried out and education on healthy lifestyle behaviors among the community in suppressing obesity and weight loss (Kementerian Kesehatan RI, 2017).

Based on the results of the study, it can be concluded that uric acid in this study can be influenced by various factors, one of which is obesity. Obesity is getting worse the risk of experiencing a higher gout occurrence. This is shown by several other studies where respondents with obesity experience more gout than normal weight respondents (Soputra & Sinulingga, 2018). While maintaining a normal body weight in adulthood, as well as weight loss in obese people (Bai et al., 2021) is one of the important requirements in reducing degenerative diseases such as gout (Leokuna & Malinti, 2020)

The relationship of dietary habit and gout

Based on the research results conducted in this area, it was found that not good eating patterns was 51.9%, with an illustration that the types of foodstuffs as a source of uric acid that were often consumed by respondents were tofu, tempeh, dried fish, offal, nuts, fried, anchovy. This study result is in line with (Songgigilan & Kundre, 2019) who found that not good eating patterns was 76.3%.

The results of statistical tests state that there is a relationship between eating patterns and the gout occurrence. The same thing was also found by other researchers, (Nurhayati, 2018) and (Songgigilan & Kundre, 2019) that there is a significant relationship between not good eating patterns and the gout occurrence. This is due to the fact that respondents in this study often consume high purine content. Purine is one of the compounds that make up uric acid in the human body. The high frequency of consuming these purines increases the incidence of the disease. Foods that are high in purines such as offal, seafood (sea food), nuts can increase the risk of gout in the community (Liu & Tan, 2019).

Uncontrolled eating patterns such as those found by researchers in this area will cause a buildup of purines in the body, thus causing an increase in uric acid levels in the blood, if it exceeds the normal size in humans. Other studies say that as evidence that low purines are healthy and maintain a good eating patterns, can reduce the rate of increase in uric acid in the blood in the community. On the other hand, an uncontrolled eating patterns tends to increase gout in the blood (Febriyanti et al., 2020).

Prevention of gout today includes reducing the prevalence of gout by giving drugs with its right dosage through a doctor's prescription in order to suppress its recurrence. However, treatment for gout sufferers/patients must definitely seek to change a balanced or healthy diet. The things that are recommended are reducing weight, consuming complex carbohydrates such as fruits, vegetables, and whole seeds while avoiding white bread, cakes, sweets, sweet drinks and products that contain high fructose. Further, it is also recommended to drink enough water and reduce fat and high purine consumption. Consuming enough vitamin C will also help. For the

person who suffers from gout, it is recommended that he be loyal and committed to a healthy and balanced diet (Timotius et al., 2019).

4. Conclusion

Factors age, gender, body mass index, and dietary habit have a relationship with the incidence of gout. Diet habit is the factor that has the greatest prevalence ratio for gout. Furthermore, it is known that respondents with a body mass index and a bad diet have 3,285 and 3,667 times greater chances of experiencing gout compared to respondents with a good body mass index and a good diet. Further research needs to be done on dietary regulation of gout levels and other risk factors with the event of gout.

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