

THE EFFECT OF PERCEPTION ON OBESITY AND ALCOHOL DRINKING PREDIABETES CAUSES TYPE 2 DIABETES MELLITUS IN TORAJA ETHNIC IN SOUTH SULAWESI PROVINCE

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ABSTRACT

The prevalence of Diabetes Mellitus (DM) has been increasing in the world for several decades. The International Diabetes Federation predicts the global prevalence of DM to be 382 million in 2013 and 529 million in 2035 and will continue to increase until 22 next year. Indonesia ranks fourth after India, China, and America. Before becoming T2DM, most sufferers experienced prediabetes. Prediabetes to T2DM is influenced by socio-cultural factors including perceptions about obesity and consuming alcohol. This study aims to determine the effect of perceptions of obesity and prediabetes alcohol drinking as a cause of T2DM in the Toraja ethnic in South Sulawesi Province. Qualitative research design with the Rapid Assessment Procedure method. The population is prediabetic from biomedical samples in Tana Toraja and North Toraja Regencies, South Sulawesi Province Riskesdas 2013. The samples are residents with prediabetes and T2DM of the Toraja ethnic group who live in Tana Toraja and North Toraja regency. Information gathering was carried out in 2018 through focus group discussions on two groups (prediabetes and T2DM). In-depth interviews with health service program managers, health center staff, health cadres, and community leaders. Research explains that there is an influence on perceptions of obesity and alcohol drinking in pre-diabetic Toraja people who cause T2DM. Obesity is perceived as a sign that a person has prospered in life, while an alcoholic drink called *tuak* is the drink consumed daily by the Toraja people.

Keywords: T2DM, obesity, alcohol (*tuak*), Toraja Ethnic

ABSTRAK

Prevalensi Diabetes Melitus (DM) telah meningkat di dunia selama beberapa dekade. Federasi Diabetes Internasional memprediksi prevalensi DM secara global menjadi 382 juta di tahun 2013 dan 529 juta di tahun 2035 dan akan terus meningkat hingga 22 tahun mendatang. Indonesia berada di urutan keempat setelah India, Cina, dan Amerika. Sebelum menjadi DM Type 2 sebagian besar penderita mengalami prediabetes. Prediabetes menjadi DM Type 2 dipengaruhi oleh faktor sosial budaya termasuk persepsi tentang obesitas dan konsumsi alkohol. Penelitian ini bertujuan untuk mengetahui pengaruh persepsi obesitas dan kebiasaan minum alkohol prediabetes sebagai penyebab DM Type 2 pada suku Toraja di Provinsi Sulawesi Selatan. Desain penelitian kualitatif dengan metode Rapid Assessment Procedure. Populasi adalah prediabetes dari sampel biomedis di Kabupaten Tana Toraja dan Toraja Utara, Provinsi Sulawesi Selatan Riskesdas 2013. Sampel adalah penduduk dengan prediabetes dan DM Type 2 dari suku Toraja yang berdomisili di Kabupaten Tana Toraja dan Toraja Utara. Pengumpulan informasi dilakukan pada tahun 2018 melalui diskusi kelompok terarah pada dua kelompok (prediabetes dan DM Type 2). Wawancara mendalam dengan manajer program layanan kesehatan, staf puskesmas, kader kesehatan, dan tokoh Masyarakat. Penelitian menjelaskan bahwa terdapat pengaruh persepsi terhadap obesitas dan kebiasaan minum alkohol pada masyarakat Toraja pra-diabetes yang menyebabkan DM Type 2. Obesitas dipersepsikan sebagai tanda bahwa seseorang telah sejahtera dalam hidupnya, sedangkan minuman beralkohol yang disebut *tuak* merupakan minuman yang dikonsumsi sehari-hari oleh masyarakat Toraja.

Kata kunci: DM Type 2, obesitas, alkohol (*tuak*), Etnis Toraja

INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia which occurs due to abnormalities in insulin secretion, insulin action, or both (WHO (1999) ⁽¹⁾⁽²⁾ with most cases being type 2 DM (T2DM). The prevalence of DM for several decades in the world has been increasing. 30 million sufferers in 1964 increased to 171 million in 2020. The International Diabetes Federation predicts a global prevalence of 382 million in 2013 and 529 million in 2035 and will continue to increase for the next 22 years ⁽³⁾. Most sufferers are in low-middle-income countries ⁽⁴⁾. DM cases in Indonesia are in fourth place after India (79,400,000 people), China (42,300,000 people), America (30,300,000 people), and Indonesia (21,300,000)⁽⁵⁾. One of the provinces with a high increase in DM prevalence from 2013-2018 is South Sulawesi (1.8%) with the largest contributor to the prevalence of the Toraja ethnic in Tanah Toraja (2.3%) and North Toraja (2.3%) districts⁽⁶⁾.

The highest risk for someone suffering from T2DM is prediabetes which will occur between 4-10 years later. This is because prediabetes already experiences insulin resistance ⁽²⁾⁽⁷⁾⁽⁸⁾ which causes blood glucose levels to be higher than normal. Prediabetes or glucose intolerance, a condition in which a person's blood glucose level is higher than normal but not yet high enough is categorized as T2DM due to TGT (impaired glucose tolerance, IGT) and/or impaired fasting blood glucose, GDPT (impaired fasting glucose, IFG)⁽⁹⁾. The change from prediabetes to T2DM is caused by obesity ⁽¹⁰⁾. The high prevalence of obesity is caused by the perception of society that considers obesity as a social status proof of prosperity so people will tend to want to be obese. Perceptions of obesity and drinking alcohol are influential socio-cultural aspects in shaping lifestyle. The incidence of obesity is also caused by a lack of physical activity, 79% of the Toraja people lack physical activity (6). Excessive alcohol consumption will worsen glucose tolerance and insulin resistance ⁽¹¹⁾.

The population in this study is prediabetes. Prediabetes is the most appropriate group for the prevention of T2DM because it is still possible to recover if sufferers can improve their lifestyle to be healthier ⁽²⁾. One prevention that can be done is a socio-cultural approach by correcting wrong perceptions in society that think that obesity is a sign of prosperity and health, even though obesity increases the risk of suffering from T2DM and limits consuming alcoholic beverages ⁽¹¹⁾.

The study aimed to determine the effect of perceptions of obesity and prediabetes alcohol drinking as a cause of T2DM in the Toraja ethnic group in South Sulawesi Province.

METHOD

The research design is qualitative with the "Rapid Assessment Procedure" method. The study population was the Toraja ethnic group with prediabetes in Tanah Toraja and North Toraja Regencies, South Sulawesi Province, who were selected as biomedical samples at the 2013 Riskesdas. The samples were residents who remained prediabetes and suffered from T2DM. Information was collected in 2018

through focus group discussions (FGD) on two groups: prediabetes and T2DM. In-depth interviews with Health Office program managers, Puskesmas officers, health cadres, and community leaders. FGD and In-depth materials are perception variables about obesity and drinking alcohol. Discussions and in-depth interviews were carried out by researchers who were assisted by research assistants using discussion and interview guidelines. The stages of the research are carried out as follows:

1. Primary data

The population is prediabetes in the Toraja ethnic community in Tanah Toraja and North Toraja Regencies aged > 15 years. The data were obtained from the 2013 Riskesdas biomedical samples which came from urban and rural areas in 2 sub-districts and 2 regencies. Prediabetes if the biomedical sample has fasting blood glucose levels: of 110-125 mg/dL and/or plasma glucose levels 2 hours after loading 140-199 mg/dL² at the time of Riskesdas 2013 and resides in Tanah Toraja or Toraja districts North. The sample is a population with prediabetes or T2DM that was selected to represent the Toraja ethnic group and reside in Tanah Toraja and North Toraja Regencies, South Sulawesi Province.

2. Blood glucose level check

The people of Tana Toraja and North Toraja districts who had prediabetes in the 2013 Riskesdas were used as the study population. The population was re-examined for blood glucose levels in 2018. The examination aims to determine whether the sample status suffers from T2DM or does not suffer from T2DM. If fasting blood glucose ≥ 126 mg/dL and/or, Impaired Glucose Tolerance with a glucose load of 75 grams ≥ 200 mg/dL and/or taking anti-diabetic drugs or insulin, then you are declared to have T2DM, the rest of the sample group with T2DM is included in the group not suffering from T2DM².

The mechanism for checking blood glucose levels begins with clarification and tracing on behalf of the population at the Tanah Toraja and North Toraja District Health Offices and community health centers. The population being tracked is carried out in the following steps: 1) Given information the day before the blood glucose test is carried out to fast for at least 8 hours (you can drink water) from the evening until the next day before capillary blood is taken for examination. 2) After taking the first blood sample, the respondent is given a drink of 200 cc of water that has been dissolved with 75 grams of un-hydrated glucose. 3) After 2 hours, the blood glucose level is checked again. The results of two examinations of blood glucose levels determine the status of the population suffering from T2DM or not.

3. Focus Group Discussion (FGD) and In-Depth Interviews

Information was obtained by doing FGD and In-Depth Interviews. The FGD was conducted on the Toraja people in each district, followed by 2 sample groups of respondents, namely those with T2DM vs. those without T2DM. Each group consisted of 6 respondents, so there were 12 respondents in each district for a total of 24 respondents in the FGD in this study. In-depth interviews are conducted with key informants. In-Depth Interviews uses an interview guide with material on people's perceptions of obesity. Apart from being recorded in daily field notes, In-Depth Interviews were also recorded with a tape

recorder. The technique of finding key informants by snowball sampling. The number of key informants is not determined, it is said to be sufficient (adequacy) if no variation of information (new information) is found that is needed. Key informants were district/city Health Service officers 1 person, health center staff 1 person, health cadres 2 persons, and community leaders 3 persons. The In-Depth interview material is about perceptions of obesity. The information collection description matrix is shown in the Table below:

Table 1. Information Gathering Description Matrix

Respondent	Type of Information	Method	Instrument
Informant: T2DM vs non T2DM	Perceptions of obesity Consuming habit <i>tuak</i>	FGD	Question guide
Key informants: District/city health office staff, health center staff, health cadres, and community leaders.	Perceptions of obesity Consuming habit <i>tuak</i>	In-Depth Interviews	In-depth interview guide

The validity of the information is maintained through data triangulation by reviewing all available data from the results of interviews, observations, field notes, and other supporting documents which are then compiled in the form of transcripts. Triangulation was also carried out by grouping respondents based on informants and variables and analyzing themes by reducing data through abstraction, classification, interpretation, and conclusions. Data triangulation matrix as in, the matrix below:

Table 2. Data Triangulation Matrix

Information	Triangulation	Sources of informants
Variables: Perceptions of obesity Habit of drinking alcohol	Source	Informants (T2DM vs. non T2DM) Key informants (District/City Health Office staff, health center staff, health cadres, and community leaders).
Variables: Perceptions of obesity Habit of drinking alcohol	Method	FGD and In-Depth Interviews

4. Data Analysis

Data analysis was carried out on the findings by the process of a) triangulation process by examining all available data from interviews, observations, daily field notes/recordings, and other supporting documents. b) All files are compiled in the form of transcripts. c) grouping information based on informants and variables. d) perform theme analysis by reducing data by abstracting, classifying, interpreting, and concluding. e) display data by arranging data in units by creating a matrix to find data that has the same characteristics or pattern. f) Interpretation of data and conclusions.

5. Ethical Clearance and Informed Consent

Research approval from the Health Research Ethics Committee of the Indonesian Ministry of Health's National Institute of Health Research and Development (LB.02.01/5.2/KE.433/2016). The informants involved in this study gave their consent by signing an informed consent.

RESULTS AND DISCUSSION

The Toraja ethnic respondents in each district totaled 12 people consisting of 6 T2DM and 6 non-T2DM. Respondents of the Toraja ethnic group, Toraja Regency, with T2DM, are mostly male. aged 43 - 66 years, the lowest education did not finish elementary school, and the highest high school, most of them work. Most of the respondents did not suffer from T2DM. aged 33 - 80 years, the lowest education did not finish elementary school, and the highest high school, most of them work.

Respondents of the Toraja ethnic group, North Toraja Regency, with T2DM, are mostly male. age 45-58 years, the lowest education is an elementary school, and the highest is a diploma, most of them work. Most of the respondents did not suffer from T2DM. age 21 - 58 years, the lowest education did not finish elementary school and the highest was junior high school, most of them did not work.

Key informants of the Toraja tribe, North Toraja Regency; (1) Manager of the nutrition program at the District Health Office, female, 50 years old, bachelor's degree in public health, head of the nutrition section of the North Toaraja District Health Office. (2) Nutrition manager at the women's health center, 43 years old, bachelor's degree in public health nutrition, nutritionist at the Rantepao Health Center. (3) Female health cadre, 39 years old, junior high school education, Posyandu cadre, Kesu Rantepao sub-district, North Toraja Regency. (4) Female community leader, 74 years old, elementary school education, a community leader in Pasele Village, Rantepao District, North Toraja Regency.

Key Toraja ethnic informants; (1) District/city health service nutrition program manager, female, 28 years old, education D III in nutrition, executor of the nutrition section of the Tana Toraja district health office. (2) Nutrition manager at the women's health center, 48 years old, bachelor's degree in public health, nutrition officer at the Makale Tana Toraja Health Center. (3) Women's health cadres, 34 years old, high school education, Posyandu Bofang Makale Toraja cadres. (4) Male community leader, 60 years old, Doctoral degree, a community leader in Lembang Sanggala', Tana Toraja Regency.

The results of the FGD on perceptions about obesity provide information that there is a difference between having T2DM and non-T2DM. Most respondents with T2DM perceive that maloppo (fat) is a good sign because it means a prosperous life, lots of money and always eating delicious food. In-depth interviews explained that people who are thin in society are not rich and have a lot of burdens, those who are rich are generally "maloppo".

"Toraja people, if their children have succeeded overseas, their parents are considered prosperous because they already have someone who guarantees their life every day, their children are obliged to send money to their parents so that their parents no longer need to work in the fields and generally have become maloppo" (Sanggala community leader, Toraja Ethnic).

The results of the FGD on the variable alcohol consumption habits provide information that there is no difference between the two groups of respondents in Toraja. In-depth interviews explained that the Toraja area is mountainous, so it is cold. People who are active outside the home, especially at night, must drink palm wine to relieve the cold. Moreover, *tuak* and smoking are symbols of friendship in society and must be served at parties.

“Tuak in Toraja is the usual drink we drink every day, If there are guests, guests must give wine, especially if there is a death party that makes us stay up all night, drinking palm wine or coffee and smoking must always be present at the party. But the wine in Toraja doesn't make us drunk. No one has ever drunk palm wine until they're drunk because wine is drunk to chase away the cold. In Toraja, it is very cold. After drinking our palm wine, we eat more rice until we are full” (Mr. AK, non-T2DM respondent, Toraja ethnic)

The word Toraja (people from the mountain) is the name given by the Bugis who live in Luwu around Palopo, derived from the word to which means 'people' and 'riaja' means 'from the mountain'. The Toraja people live in the northern part of South Sulawesi and Central Sulawesi. (Lake Poso), Palu River, Sa River). The origin of Toraja tribe is thought to be from Dongson (North Vietnam) who immigrated to Sulawesi at the same time as the Dayak tribe in Kalimantan and the Batak tribe in North Sumatra. The Toraja Sa' tribe is considered a Young Malay nation that gave birth to kings in Toraja, Luwu, and Gowa.

The definition of obesity for the Toraja tribe is that a person is considered *maloppo* (fat) and drinking *tuak* (alcohol) is the Toraja people's habit of consuming alcoholic beverages. Disease with the perception that is believed by the Toraja people makes this community a group at risk of suffering from T2DM.

Obesity is one of the symptoms of MetS, becoming a public health problem in the world. It is estimated that 34% of the adult population is obese plus 34% are overweight ⁽¹²⁾. Being overweight and obese are biological factors that cause an increased risk of developing T2DM because they are responsible for increasing body weight ⁽¹⁰⁾, including central obesity which is caused by the accumulation of fat in the visceral area ⁽¹²⁾.

Perceptions of obesity influence shaping lifestyles. People who perceive obesity as a good thing tend to be obese, so it has an impact on the occurrence of T2DM. Obesity with prediabetes is an early event in the occurrence of T2DM because obesity already has a metabolic syndrome that results in insulin resistance or glucose intolerance ⁽¹³⁾. The pathogenesis of T2DM is caused by impaired pancreatic islet cells accompanied by insulin resistance that occurs due to weight gain and body mass. Obesity causes insulin resistance and pancreatic cell dysfunction so controlling body weight so that you are not obese is a preventive measure so that prediabetes does not develop into type 2 DM ⁽¹⁴⁾.

The stigma surrounding the obese society in North America is that individuals who are lazy, weak-willed, unsuccessful, lack intelligence, and lack self-discipline but eat too many high-calorie foods

out of balance with calorie burning ⁽¹⁵⁾. With this stigma, those who are obese are discriminated against in their workplaces, health facilities, educational institutions, and the mass media, and become closed individuals ⁽¹⁵⁾⁽¹⁶⁾. This condition is also experienced by the people of the Toraja tribe, who say that the people's favorite foods are rice and meat, known as *pa'piong* and *pamarrasang*. *Papiong* is the food of the Toraja people by putting pork or chicken in bamboo and then burning it. *Pamarrasang* is a kind of tree whose leaves are pounded and then mixed with vegetables as a spice, the skin is sliced thin and dried to make vegetables. The most important thing for the Toraja people is rice, no need for fish and vegetables.

The effect of alcohol on protection against T2DM is not fully explained, most studies show a "U" shape relationship between alcohol consumption and the risk of T2DM and its complications ⁽¹⁷⁾. Moderate alcohol consumption can reduce the risk of developing T2DM and is also associated with improving the metabolic system and complications such as microvascular complications (retinopathy and nephropathy) and a decrease in macrovascular events and the risk of death ⁽¹⁸⁾, but in large quantities, it will worsen glucose tolerance and insulin resistance ⁽¹¹⁾.

Toraja people generally live in cold mountainous areas, so the culture of consuming *tuak* (alcohol) and smoking is a tradition to fight the cold, especially when holding a death feast culture (*rambu solo*) every year. People never consume *tuak* excessively, but only to warm the body so consuming alcohol at low doses can prevent the occurrence of T2DM ⁽¹⁷⁾. The benefits of consuming alcohol cannot be generalized to each individual but depend on the amount of moderate alcohol consumption, age, sex, body mass index, ethnicity, and type of alcoholic drink ⁽¹⁷⁾.

CONCLUSION AND SUGGESTION

The results of the study show that there is an influence on perceptions of prediabetic obesity in the Toraja people in South Sulawesi Province causing T2DM, but the habit of consuming alcohol does not show a consistent effect. Society perceives obesity as something good that increases the risk of developing T2DM. The cultural approach that people who perceive obesity as a sign of prosperity is wrong.

The habit of consuming alcohol in moderation has a positive effect on preventing the occurrence of type 2 DM in the Toraja ethnic, but in excess amounts, it triggers the occurrence of type 2 DM. A scientific explanation is needed for Toraja people about the benefits of consuming alcohol in moderation.

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FUNDING

This research was conducted with its funding sources.

ACKNOWLEDGMENT

The author thanks. Head of Health Office of Tana Toraja and North Toraja Regencies, Highest appreciation to, Elia, SKM, John Sura, SKM, for the enormous support to researchers.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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