

FACTORS RELATED TO EATING BEHAVIOR OF MEN AND WOMEN IN TOMOHON, INDONESIA

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ABSTRACT:

Background: Nearly 80% of deaths caused by non-communicable diseases occur in low and middle-income countries, including Indonesia. In 2007 the prevalence of non-communicable diseases in Tomohon city was higher than national and provincial level, and in 2010 there were 18,548 cases of hypertension among 92,583 people in Tomohon city. Previous studies showed that eating unhealthy foods is significantly related to non-communicable diseases. Also, men and women had different eating behavior. Therefore, it is important to identify factors relating to eating behavior of men and women separately, especially in those who are at risk of non-communicable diseases, in order to decrease the prevalence of the diseases in Tomohon city. This study aimed to determine the factors related to eating behaviors of men and women in Tomohon, Indonesia.

Method: A cross-sectional design with multi stage sampling technique and a convenience sampling method was used. Data were collected by using a self-administered questionnaire from 105 adult men and 184 women at seven sub-districts in Tomohon, Indonesia. Descriptive statistics and Pearson product moment correlation were used for data analysis.

Result: The study revealed that the proportion of women having good eating behavior was higher than that of men (6.5% and 1.9%, respectively). Eating behavior of men had significant correlations with attitude ($r = 0.404, p < 0.05$) and perceived barriers avoiding unhealthy food ($r = -0.530, p < 0.05$). Eating behavior of women had significant correlations with attitude ($r = 0.245, p < 0.05$), perceived barriers to consuming healthy food ($r = -0.340, p < 0.05$), and perceived barriers to avoiding unhealthy food ($r = -0.286, p < 0.05$). There were no significant correlations between perceived benefit and eating behavior in either men or women (men: $r = 0.071, p > 0.05$, women: $r = -0.057, p > 0.05$).

Conclusion: There were still many men (18.1%) and women (3.8%) in Tomohon who had poor eating behavior. Therefore, Eating behavior of men and women in this group needs to be improved. Health promotion programs for this group should focus on attitude, and overcoming the barrier to consuming healthy food and avoiding unhealthy food to adopt good eating behaviors.

Keywords: Perceived benefit, Perceived barrier, Eating behavior, Indonesia

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INTRODUCTION

According to World Health Organization (WHO) in 2008, Indonesia had the 2nd highest number of non-communicable diseases (NCDs) deaths among 11 countries in South-East Asia Region (SEAR), ranking after India and the 5th highest number of NCDs in the world [1]. NCDs deaths in Indonesia in 2008 represented 64% of all deaths in the country and the leading causes were

cardiovascular diseases (30%), cancers (13%), respiratory diseases (7%), and diabetes mellitus (3%) [2]. North Sulawesi Province as the part of East Region of Indonesia had higher level of NCDs than the national level in 2007 and even by the National statistics in 2013, North Sulawesi province has the highest number of hypertension (15.0%) and stroke (10.8%) in Indonesia [3,4]. Specifically in Tomohon City, NCDs cases in this city are increase every year. In 2007, the number of NCD cases in Tomohon City is more prevalent than those of national and provincial cases, categorically in

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hypertension (13.6%), diabetes mellitus (2.1%), and cancer cases (0.9%) [5]. In 2012 the statistics department of Tomohon City reported that hypertension ranked as the number one disease in Tomohon City (59,853 cases), followed by arthritis (8,029 cases), diabetes mellitus (5,101 cases), and asthma (1,544 cases) from a total population of 93857 people in Tomohon City [6]. Therefore, with this data, it has been shown that preventive measure for NCDs is a primary need in Tomohon City.

NCDs are related to four common risk factors. These are tobacco use, unhealthy diet, insufficient physical activity, and the harmful effect of drinking alcohol [1]. Unhealthy diet is one of important factors relating to NCDs since this is related to daily food consumption, which has a strong effect on four key metabolic and physiological changes; increasing blood pressure, hyperglycemia, hyperlipidemia, and overweight/obesity, all of which can lead to NCDs. Unhealthy diet includes three major elements; low fruit and vegetable consumption, high salt intake, high fat consumption [1]. A study of adults in Wajo, Indonesia found that inadequate consumption of fruit and vegetable was the most significant factor of diabetes mellitus type 2 compare to physical activity, smoking, and stress [7]. Factors that related with unhealthy diet in adults can be difference in terms of eating behavior of men and women.

There are previous studies that describe eating behaviors in men and women. A study in a western country carried out among people aged 18-35 years old found that men cannot control their unhealthy eating habits like woman. And woman was more concern about body checking, food avoidance, uncontrollable eating, and fasting to maintain their weight and body shape [8]. It was found from previous studies that there were differences in the eating behavior of men and women. Therefore, this study was conducted to identify factors relating to the eating behavior of men and women in Tomohon, Indonesia.

The Health Belief Model was used as the framework of this study to explain factors relating to eating behavior of the at risk population in Tomohon City, which includes perceived severity, perceived susceptibility, perceived benefit, perceived barrier, and attitude towards foods was added [9, 10]. The result of this study will be useful in guiding the intervention to motivate people to adopt healthy eating behavior and consequently, reduce NCDs in Tomohon, Indonesia.

MATERIAL AND METHODS

Study population

A cross-sectional survey method was used in this study. Probability proportional to size was used to estimate the number of the samples, multi stage sampling technique in city and district level, and convenient sampling method in sub district level was used to identify the samples. The data were collected from 105 adult men and 184 women at seven sub-districts in Tomohon, Indonesia. The participants voluntarily participated in this study, all of whom met the inclusion criteria which included age 25-59 years, not diagnosed as having NCDs, could read and write in Bahasa (Indonesian language), having lived in Tomohon at least 2 years, and willing to take part in the study and sign the consent form. Whereas, who had mental illness, and hospitalized at the time of data collection were excluded from this study.

This study was approved by the Ethics Review Board Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira (ERB NO.36/2014). Participants were assured for their willingness to participate in the study was voluntary, they also had the rights to refuse or withdraw from the study at any time.

Data collection

The data were collected by using self-administered questionnaires which was given to the participants in their home. The questionnaires were filled out and returned to the researcher in one day. Before filling out the questionnaire, the participants were given the information about the background, objective, procedure, benefit of the study, and they were joining the study voluntarily with signed the informed consent. The data collection was taken during July until September 2014.

Measurement tool

The self-administered questionnaire includes 6 parts translated into Bahasa Indonesia language and was used to collect the necessary data in this study. Initially this questionnaire was developed in English version based on the literature review on factors related to eating behavior and reviewed and validated by four experts, two from Thailand and two from Indonesia, who are specialized in nutrition and behavioral science with content validity index for scale (S-CVI) for all parts were 1.0 which was considered as valid [11].The questionnaire consists of the following parts:

1. Data demographic of participants in Tomohon, Indonesia.

Table 1 Level of attitude, perceived benefit of and perceived barrier to consuming healthy food, perceived barrier to avoiding unhealthy food of men and women.

Factors	Men (n=105)		Women (n=184)	
	Number	%	Number	%
Attitude				
Good	48	45.7	60	32.6
Fair	45	42.9	93	50.5
Poor	12	11.4	31	16.8
Mean \pm S.D = 22.71 \pm 5.42, 24.58 \pm 4.38				
Min-Max = 11-31, 11-32				
Perceived benefit				
Highly	30	28.6	52	28.3
Moderate	48	45.7	99	53.8
Lowly	27	25.7	33	17.9
Mean \pm S.D = 11.98 \pm 4.03, 12.62 \pm 3.10				
Min-Max = 0-18, 0-17				
Perceived barrier (healthy food)				
Highly	3	2.9	2	1.1
Moderate	4	3.8	10	5.4
Lowly	81	77.1	141	76.6
No barrier	17	16.2	31	16.8
Mean \pm S.D = 7.03 \pm 4.89, 7.03 \pm 5.09				
Min-Max = 0-24, 0-25				
Perceived barrier (unhealthy food)				
Highly	3	2.9	0	0.0
Moderately	29	27.6	4	2.2
Lowly	64	61.0	158	85.9
No barrier	9	8.6	22	12.0
Mean \pm S.D = 14.34 \pm 6.98, 9.53 \pm 5.14				
Min-Max = 0.00-28.05, 0.00-23.75				

- Attitude related to unhealthy eating behavior questionnaire was developed according to the common attitude of adults in Tomohon. The reliability with Cronbach's alpha was 0.705.
- Perceive barrier healthy food questionnaire was developed by Noma [12] and modified based on the food items and barrier to consuming healthy food in Tomohon. The reliability with Cronbach's alpha was 0.835.
- Perceive barrier unhealthy food questionnaire was a modified questionnaire based on perceive barrier questionnaire developed by Noma [12]. This questionnaire was modified based on unhealthy food items and barrier to avoiding consuming unhealthy food in Tomohon. The reliability with Cronbach's alpha was 0.957.
- Perceive benefit toward food to prevent NCDs questionnaire was developed according to the food items in Tomohon. The reliability with Cronbach's alpha was 0.700.
- Eating behavior questionnaire was developed by Noma [12] and modified based on the food items in Tomohon. The reliability with Cronbach's alpha was 0.703.

Statistical analysis

The Statistical Package for the Social Sciences for Windows was applied to analyze the data. Pearson product moment correlation was used to identify the relationship between attitude, perceived benefit, perceived barrier to consuming healthy food, perceived barrier to avoiding unhealthy food, and eating behavior. The Cronbach's alpha coefficient was used to examine the reliability of the instruments.

RESULTS

Socio-demographic characteristics

This study was conducted among 105 men and 184 women in Tomohon City, both men and women aged ranged from 25 to 59 years old, with mean age of men 39.49 years, and women 37.73 years, standard deviation of 9.95 and 10.33 respectively. Most of the participants are married (men = 73.3%, women = 72.8%), and almost 50% of them had completed senior high school (women = 49.5%, men = 46.7%). Nevertheless, majority of them have low monthly income (women = 72.3%, men = 61.9%). Over 80% of both men and women were Christian and Minahasa ethnicity.

Table 2 Number and percentage of eating behavior level of men and women

Eating behavior	Men (n=105)		Women (n=184)	
	Number	%	Number	%
Good	2	1.9	12	6.5
Fair	84	80.0	165	89.7
Poor	19	18.1	7	3.8
Mean±S.D = 81.74±6.76, 86.34±5.79				
Min-Max = 67-99, 72-101				

Table 3 The correlation between attitude, perceived benefit of and perceived barrier to consuming healthy food, perceived barrier to avoiding unhealthy food, and eating behavior

Factors	Men		Women	
	r	p-value	r	p-value
Attitude	0.404	0.000*	0.245	0.001*
Perceived benefit	0.071	0.471	-0.057	0.438
Perceived barrier (Healthy food)	-0.150	0.126	-0.340	0.000*
Perceived barrier (Unhealthy food)	-0.530	0.000*	-0.286	0.000*

*p-value < 0.05 indicate significance

Body Mass Index (BMI)

The respectively BMI of both male and female ranged from 16 to 36 kg/m² and 17 to 37 kg/m², and the average BMI of participants are 24.74 and 24.13 with standard deviation 3.51 and 3.68, respectively. There were also found that male had higher prevalence of overweight (male = 41.9%, female = 33.2%) and obese (male = 6.0%, and female 6.5%) than female.

Factors relating to eating behavior of men and women

Table 1 shows that on average women had better attitudes towards food than men. The mean score of both men and women were 24.58, SD of 4.38, and 22.71, SD 5.42, respectively. It was found that the majority of both men and women had moderately level of perceiving the benefits of food (45.7% and 53.8%, respectively). The mean score of perceived barrier to consuming healthy food both of men and women was 7.03, and SD of 4.89 and 5.09, respectively. It was found that men had higher average score of perceived barrier to avoiding unhealthy food than that of women (score of men of 14.34 and women of 9.53, with SD of 6.98 and 5.14, respectively)

Table 2 shown on average women had better eating behavior than men in Tomohon city. The mean score of both men and women were 81.74, SD of 6.76, and 86.34, SD 5.79, respectively.

As shown in Table 3, the results showed a statistically significant correlation between attitude, perceived barrier to avoiding unhealthy food and eating behavior of men. There was no significant correlation between perceived benefit, and perceived barrier to consuming healthy food and

eating behavior of men. The result also showed a significant correlation between attitude, perceive barrier to consuming healthy food, and perceive barrier to avoiding unhealthy food, on one hand, and eating behavior of women, on the other. There was no significant correlation between perceived benefit and eating behavior of women.

DISCUSSION

This study shows that women had better eating behavior than men. This also can reflect in their BMI, which shows that male had a higher proportion of overweight and obesity levels than female. This finding is supported by a previous study that explained that female were more considerate about the safety and nutritional value of food than male [13]. This study also showed that female were more likely to control their food consumption by consuming healthy food more than male, this is supported by previous study which said female were more likely doing body checks, food avoidance and fasting to maintain their weight and body shape than male [8] and It is often the case that female consume more fruit and vegetables than male because, in general, female are more concerned about their body image and self-esteem [14]. The study done in New England also shows that eating behavior is a predictor of weight gain among female, and this is related to their feeling of disinhibition regarding their body weight [15].

The current study also showed that on average, women had better attitudes towards foods than men. More than one-quarter of men agreed to providing alcohol in parties, and agreed that drinking carbonated drinks can help to quench thirst better and makes the drinker feel more relaxed. And more

than one-quarter of women agreed that sweet deserts can relieve stress (Table 2). This data is supported by a previous study that explained that taste is a strong predictor of attitude towards food. For example, the food choice of people may not rely on the nutrition that is in the food but taste is more important than that [16].

However, for perceived benefit of men and women in Tomohon still need to improve knowledge about the benefits of avoiding unhealthy foods to prevent NCDs (Table 3) regarding the previous study in Nigeria said that knowledge about the effects of food to NCDs are related with eating behavior [17]. Furthermore, this current study revealed that eating behavior had a significant relationship with perceived barriers to consuming healthy foods, and a perceived barrier to avoiding unhealthy food. The barrier to avoiding unhealthy food is perceived by men as being much higher than women. The main reasons cited for barrier to avoiding unhealthy food were unhealthy food were more widely available and affordable than unhealthy food in Tomohon. This finding is also supported by the previous study that explained that unavailability of food and high food price are considered as barriers to perform good eating behaviors, the previous study also said that perceived barrier to avoiding unhealthy food is directly related with eating behavior due to the general perception that the taste of unhealthy food is better than healthy food [13, 18].

Regarding to Health Belief Model as the framework of the study, the result of this study showed that perceived barrier to consuming unhealthy food and perceived barrier to avoiding unhealthy food had significant correlation with the eating behaviors of men and women in Tomohon city in negative way. This suggests that lowering the levels of perceived barrier to consuming healthy food and avoiding unhealthy food can increase the likelihood of adopting healthy eating behaviors among the at risk population in Tomohon city, Indonesia.

LIMITATIONS

This study used a convenience sampling method to collect the data that may not be representative of all men and women in Tomohon, Indonesia. However, the participants in this study can represent men and women in Tomohon by comparing the demographic characteristics of the samples in this study to that of the population in Tomohon. This demographic information was based on a 2013 Statistics bureau survey which shows that the majority of Tomohon people aged 15 to 65 years (69.10%), finished junior high school, and

Christianity and Minahasan ethnicity are predominant in this city [19-21]. This current study shows that the ranged of aged of participants are 25 to 59 years with average 38.37 years, 48.4% had finished senior high school, and the participants are predominantly Christian and Minahasan ethnicity. The data revealed that participants in this study are similar to the general data survey of demographic characteristics of people in Tomohon City, which indicates that participants in this study are representative adults for Tomohon city, Indonesia.

CONCLUSION

This study purposed to identify factors relating to eating behavior of men and women in Tomohon, Indonesia which included attitude, perceive benefit, perceive barrier healthy food, and perceive barrier unhealthy food. The results revealed that eating behavior of men had a significant relationship with attitude and perceived barriers to avoiding unhealthy food, and no associated with perceived benefit, and perceived barrier to consuming healthy food. Eating behavior of women had significant relationship with attitude, perceived barrier to consuming healthy food, and perceived barrier to avoiding unhealthy food, and no associated with perceived benefit. The result of this study can be used as evidence to develop health promotion and prevention programs for men and women in Tomohon city which is related with eating behavior to tackle NCDs.

CONFLICT OF INTERESTS

There was no conflict of interest from this study.

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