



FACTORS RELATING TO EATING BEHAVIOR OF ADULTS IN TOMOHON, INDONESIA

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ABSTRACT

The purpose of this study was to determine factors relating to eating behavior of adults in Tomohon, Indonesia. Eating behavior regarding to unhealthy diet is one of the behavioral factors that important one to study in the way to tackling non communicable diseases. Therefore, it is important to identify factors relating to eating behavior of people, especially those who are at risk of non communicable diseases. A cross-sectional survey design was used in this study with sampling method combined of multi stage sampling technique and convenience sampling method. Data were collected by self-administrated questionnaire from 300 adults at seven sub districts in Tomohon, Indonesia. Pearson product moment correlation and Spearman's rank correlation were used for data analysis. The result of analysis revealed that there were significant correlations between gender, attitude, perceive barrier to consuming healthy food, and perceive barrier to avoiding unhealthy food with eating behavior. However, there were some factors not have correlation with eating behavior were found included age, educational level, and perceive benefit. In conclusion, the health promotion as an intervention program related to eating behavior to tackling non-communicable diseases in Tomohon city can be focus on gender, attitude, and overcoming the barrier toward good eating behavior.

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KEYWORDS: Eating behavior, Adults, Non communicable diseases, Age, Gender, Educational level, Attitude, Perceived benefit, Perceived barrier.

INTRODUCTION

Globally, the cases of non communicable diseases are increasing every year. World Health Organization reported that non communicable diseases are the leading causes of death globally, nearly 80% occurs of these deaths in low- and middle-income countries included Indonesia. According to World Health Organization in 2008 Indonesia was the second highest number of non communicable diseases deaths among 11 countries in South-East Asia region after India and the fifth highest number of non communicable diseases in the world (Alwan, 2011) and non communicable diseases in Tomohon city also increasing every year. In 2007 the cases of non communicable diseases in Tomohon city has higher cases prevalence than national and provincial (North Sulawesi) in hypertension (13.6%), Diabetes mellitus (2.1%) (Sulut, 2008) and furthermore in 2011, statistics department report that hypertension is the highest number disease in Tomohon (18548 cases), and followed by arthritis (3266 cases), diabetes mellitus (1318 cases) from the total population 92583 people in Tomohon city (Statistics Center Department, 2013). The increasing number of non communicable diseases related to behavioral factor such as eating behavior that related with the nutrition in daily life.

Indonesia has some health policy regarding to eating behavior. Ministry of health also launched "Clean and Healthy Behaviors" that including of promoting enough of fruit and vegetable consumption. Health promotion centre of Indonesia also specify the applicable of this policy in the every office in Indonesia by consume fruit and vegetable 3-5 portion per day (Promkes, 2012).

Despite the intensive effort of the government and the ministry of health in motivating people to consume more foods and vegetable to avoid non communicable diseases, in 2007 only small proportion of people (38.7%) that met the requirements of “Clean and Healthy Behaviors” program (Depkes, 2008). And basic health survey in 2007 reported 43% of people in North Sulawesi province consuming high fat (Depkes, 2008). In 2009, Ministry of Health also launched law 36/2009, verse 141 written that all Indonesian people have to improve their eating behavior with consuming food that containing balanced nutrition (Ministry of Health, 2009). However, even though the policies are applying in all Indonesian people but number of non communicable diseases case still increasing every year in Indonesia. Therefore, health care providers have to more focus to others factors like belief of people toward food and eating behavior beside the nutrition consumption in the way to tackling non communicable diseases.

This study used Health belief model as the framework of study to explain about the factors that relating to eating behavior of people to prevent non-communicable disease which is consist of demographic variable; age, gender, educational level, perceptions; perceived benefit, perceived barrier to consuming healthy food, perceived barrier to avoiding unhealthy food, and adding with attitude toward foods.

Since eating behavior is strongly related to the prevalence of non communicable diseases, it is important to identify factors relating to eating behavior of people, especially those who are at risk in this city. The result of this study will be useful in guiding the intervention to motivate people to adopt healthy eating behavior and consequently, reduce non communicable diseases in Tomohon, Indonesia.

LITERATURE REVIEW

Eating behavior regarding to unhealthy diet is one of behavioral factors that important one to study in the way to tackling non communicable diseases because this is related with the daily food as primary needs of human being in their life and strong cause of four key metabolic and physiological changes including increasing blood pressure, hyperglycaemia, hyperlipidemia, and obesity that can develop to be non communicable diseases (Alwan, 2011).

Unhealthy diet is consist to three major elements consists of low fruit and vegetable consumption, high salt intake, and high fat consuming. Low fruit and vegetable consumption has risk of cardiovascular diseases, stomach cancer, and colorectal cancer. High salt intake has risk to rising blood pressure levels and overall cardiovascular diseases. And high fat consuming especially saturated fat and trans fat has risk to cause coronary heart disease, and type 2 diabetes mellitus (Alwan, 2011).

In the Eastern Mediterranean country, nutrition problems that related non communicable diseases is the most frequent causes of morbidity and mortality of people there especially the adults. That consists of high concentration of serum cholesterol, tobacco smoking, unhealthy eating habits, and obesity (Musaiger and Al-Hazzaa, 2012). There is a study in Cengkareng, Indonesia said that obesity is the most significant factor of diabetes mellitus type 2 compare to age, family health history, stress, and physical activity (Trisnawati and Setyorogo, 2012) and also the study of adults people in Wajo, Indonesia said that less of consuming fruit and vegetable is the most significant factor of diabetes mellitus type 2 compare to physical activity, smoking, and stress (Rahman *et al.*, 2013).

Eating behavior can influence by the socio cultural factors which is like Minahasan ethnicity that predominantly ethnicity in Tomohon have belief that meat is symbol of wealthy (Weichart, 2002) and this belief related with the unhealthy eating behavior practice and as barrier to give health education related with healthy eating behavior practice to people in the way to tackling non communicable diseases (Hendriks *et al.*, 2012) (Donnelly *et al.*, 2011). Some study of eating behavior of adults that used health belief model as the framework of study also described that eating behavior can be influenced by the individual factors behavior of the people such as attitude, knowledge, cues to action, and perception that consists of perceived susceptibility, perceived seriousness, perceived benefit, and perceive barriers (Fila and Smith, 2006) (Noma, 2007) (Deshpande *et al.*, 2009) (Harris *et al.*, 2009). However, inconsistency finding still found in those studies. And based on these previous studies, this study also used health belief model as the base of

study framework that can explain about the factors relating to eating behavior of people to prevent non-communicable disease including demographic variable that can affect the perception benefit, and minimum of perceive barrier to increase the like hood of taking recommended preventive health action with asses the feeling, perception, of person as an individual that interrelated with the personal factors and environment factors surround them (Becker, 1974) (Glanz *et al.*, 2008). Therefore, with using Health Belief Model as the framework of study, this study aim to determined the factors relating eating behavior that includes demographic variable, attitude, perceived benefit, perceived barrier to consuming healthy food, and perceive barrier to avoiding unhealthy food of adults in Tomohon, Indonesia.

METHODOLOGY

Research Design

A cross-sectional survey design was used in this study.

Population and Sample

Multi stage sampling technique was use to find the proportions of participants from total population in Tomohon city, 5 districts, and 7 sub districts which is work area of 7 Public health centre in Tomohon. And convenient sampling technique was used in this study to recruit the participants in the sub districts. The estimated sample size used confidence level 95% ($z=1.96$), precision value (σ) = 0.07, proportion of high fat consuming in North Sulawesi (43%) (p)= 0.43, and design effect ($deff$) =1.5 (the formula: $n = \left(\frac{z^2 \times p(1-p)}{\sigma^2} \right) \times deff$) the estimated sample size was 288, and increased to 300 in order to prevent missing data. Data were collected from 300 adults who met the following inclusion criteria: (1) aged 25 until 59 years old, (2) not diagnosed non communicable diseases, (3) can read and write Bahasa Indonesia language,(4) live in Tomohon minimal 2 years, and (5) willingly to take part in the study and sign consent form, and the adults not met the exclusion criteria following: (1) adult who have mental illness, (2) adult who in hospitalize at the time of collecting data.

Data Collection

Data collection was taken during July until September 2014 by collaborating with community nurse in public health centre, the government, and health volunteer in sub districts. Self-administrated questionnaire was given to participant in their home which they filled in by themselves and returned back on one day. Before collected the data, the participants was given the short information about the background, objective, procedure, and benefit of the study and they were voluntary signed the informed consent. And all the data were kept confidential.

Research Instrument

The self-administrated questionnaire includes 6 parts translated into Bahasa Indonesia language 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.

The questionnaire consists of the following parts:

Demographic Characteristics

Demographic characteristics survey form was used to assess personal data that includes gender, age, and educational level.

Attitude

Attitude related to unhealthy eating behavior questionnaire was developed according to the common attitude of adults in Tomohon. This parts consists of 11 items, with three rating scale (1= agree, 2 = uncertain, 3 = disagree). A score of attitude was range 11-33, and categorized into three levels of attitude (Good ($\geq 80\%$) = ≥ 29 , Fair (60%-79%) = 24-28, Poor (<60%) = ≤ 23). The reliability with Cronbach's alpha = 0.705.

Perceived Barrier to consuming Healthy Food

Perceive barrier to consuming healthy food questionnaire was developed by Noma (2007) and modified based on the food items and barrier to consuming healthy food in Tomohon. This part consist of 5 items and 22 sub items, with five rating scale (1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree). And 0 score for “no barrier”. The total score of each item was divided by total number of sub items in each item. The score was range 1.00-25.00 and 0 = no barrier, and categorized into four levels of barriers (Highly ($\geq 80\%$) = ≥ 20.20 , Moderate (60%-79%) = 15.40-20.19, Lowly ($\leq 60\%$) = ≤ 15.39 , No barrier = 0). The reliability with Cronbach's alpha = 0.835.

Perceived Barrier to avoiding Unhealthy Food

Perceive barrier to avoiding unhealthy food questionnaire was modified questionnaire based on perceive barrier questionnaire developed by Noma (2007). This questionnaire was modified based on unhealthy food items and barrier to avoiding consuming unhealthy food in Tomohon. This part consist of 6 items and 30 sub items, with five rating scale (1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree). And 0 score for “no barrier”. The total score of each item was divided by total number of sub items in each item. The score was range 1.00-30.00 and 0 = no barrier, and categorized into four levels of barriers (Highly ($\geq 80\%$) = ≥ 24.20 , Moderate (60%-79%) = 18.40-24.19, Lowly ($\leq 60\%$) = ≤ 18.39 , and No barrier = 0). The reliability with Cronbach's alpha = 0.957.

Perceive Benefit

Perceive benefit toward food to prevent non communicable diseases questionnaire was developed according the food items in Tomohon. This part consist of 19 items of food, and scoring 0 = causing disease, 1 = no disease. A score of perceived benefit was range 0-19, and categorized into three levels of benefit (Highly ($\geq 80\%$) = ≥ 15 , Moderate (60%-79%) = 11-14, Lowly ($\leq 60\%$) = ≤ 10). The reliability with Cronbach's alpha = 0.700.

Eating Behavior

Eating behavior questionnaire was developed by Noma (2007) and modified based on the food items in Tomohon. This part consists of 19 food items which consist of 4 healthy foods and 15 unhealthy foods. And used 6 frequency category (Healthy food; 1 = zero to one time in two weeks, 2 = two to four times in two weeks, 3 = five to seven times in two weeks, 4 = one times per day, 5 = two times per day, 6 = equal or more than three times per day. Unhealthy food; 6 = zero to one time in two weeks, 5 = two to four times in two weeks, 4 = five to seven times in two weeks, 3 = one times per day, 2 = two times per day, 1 = equal or more than three times per day) with range score 19-114 and categorized into three levels of eating behavior (Good ($\geq 80\%$) = ≥ 95 , Fair (60%-79%) = 76-94, Poor ($\leq 60\%$) = ≤ 75). The reliability with Cronbach's alpha = 0.703.

Ethical Consideration

Ethical approval was obtained for this study by the Ethics Review Board Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira. Each participant was given information about the objective, method, and benefit of the study. The participants was asked to sign the informed consents if they agree with voluntary to contribute in this study and they have right to reject and withdraw from this study at any time. All data from participant were kept confidential.

RESULT AND DISCUSSION

Data analysis for this study was using Statistical Package for the Social Sciences (SPSS) version 17.0. Frequencies of the variables were presented using descriptive statistics consists of number, mean, minimum, maximum, percentage, and standard deviation. Reliability of the measurement tools was examined by Cronbach's alpha coefficient. Pearson product moment correlation was used to identify the relationship between age, gender, attitude, perceived benefit, perceived barrier to consuming healthy food, perceived barrier to avoiding unhealthy food, and

eating behavior. And Spearman's rank correlation was used to identify the relationship between educational level and eating behavior, and educational level with perceptions. All tests were 2-sided with p -value less than 0.05 was considered statistically significant.

Out of the total 300 questionnaires, 11 were excluded from data analysis due to missing data and outliers in the normality data. Therefore 289 data of participants were used in the data analysis. The average age of participants was 38 years old (S.D = 10.21), 184 (63.7%) were female and 105 (36.3%) are male. The majority of participants had completed the highest education level in Senior high school (48.4%).

Eating Behavior of Adults in Tomohon

Table-1. Number and Percentage of Level of Eating Behavior of Participant (N=289)

Level of eating behavior	Number	Percent
Good	14	4.8
Fair	249	86.2
Poor	26	9.0
Mean \pm S.D = 84.67 \pm 6.54		
Min-Max = 67-101		

Table 1 shows the highest percentage of level of participant who performed eating behavior practice was fair eating behavior (86.2%), followed by poor eating behavior (9.0%), and good eating behavior (4.8%).

Attitude and Perceptions of Adults in Tomohon

Table-2. Distribution Number and Percentage Attitude and Perceptions of Participant (N=289)

Variables	Number	Percent
Attitude		
Good	108	37.4
Fair	138	47.8
Poor	43	14.9
Mean \pm S.D = 23.90 \pm 4.86		
Min-Max = 11-32		
Perceived Benefit		
Highly	82	28.4
Moderate	147	50.9
Lowly	60	20.8
Mean \pm S.D = 12.39 \pm 3.47		
Min-Max = 0-18		
Perceive Barrier (Healthy food)		
Highly	5	1.7
Moderate	14	4.8
Lowly	222	76.8
No barrier	48	16.6
Mean \pm S.D = 7.03 \pm 5.01		
Min-Max = 0.00-25.00		
Perceive Barrier		

Continue

(Unhealthy food)	3	1.0
Highly	33	11.4
Moderate	222	76.8
Lowly	31	10.7
No barrier		
Mean±S.D = 11.28±6.30		
Min-Max = 0.00-28.05		

Table 2 shows the majority of participant had fair level of attitude (47.8%), moderate level of perceived benefit (50.9%), perceive lowly barrier to consuming healthy food (76.8%) and perceive lowly barrier to avoiding unhealthy food (76.8%). However, the result also found that 37.4% of participant had good level of attitude, 16.6% of participants perceive no barrier to consuming healthy food, and about 10.7% of participants also perceive no barrier to avoiding unhealthy food.

Correlation of Factors Relating to Eating Behavior of Adults in Tomohon

Table-3. Correlation Between Age, Gender, Educational Level, Attitude, Perceived Benefit, Perceived Barrier to Consuming Healthy Food, Perceived Barrier to Avoiding Unhealthy Food, With Eating Behavior Of Participant (N=289)

Factors	Eating behavior	
	r	p
Gender	0.339	0.000
Age	0.068	0.249
Educational level	0.101	0.087
Attitude	0.355	0.000
Perceive benefit	0.032	0.589
Perceive barrier (healthy food)	-0.249	0.000
Perceive barrier (unhealthy food)	-0.475	0.000

Correlation between Demographic Variable and Perceptions

Table-4. Correlation Between Age, Gender, Educational Level, Perceived Benefit, Perceived Barrier to Consuming Healthy Food, and Perceived Barrier to Avoiding Unhealthy Food of Participant (N=289).

		Perceived benefit	Perceived barrier (healthy food)	Perceived barrier (unhealthy food)
Age	r	-0.002	-0.080	-0.072
	p	0.966	0.174	0.222
Gender	r	0.089	0.000	-0.368
	p	0.133	0.996	0.000
Educational level	r	0.164	-0.127	-0.110
	p	0.005	0.031	0.061

According to table 3 gender ($r = 0.339, p < 0.05$), attitude ($r = 0.355, p < 0.05$), perceive barrier to consuming healthy food ($r = -0.249, p < 0.05$) and perceive barrier to avoiding unhealthy food ($r =$

-0.475, $p < 0.05$) are statistically significant associated with eating behavior. However age ($r = 0.068$, $p > 0.05$), educational level ($r = 0.101$, $p > 0.05$) and perceived benefit ($r = 0.032$, $p > 0.05$) are not statistically associated with eating behavior.

This study revealed that there are important factors than can influence eating behavior among adults in Tomohon, Indonesia. Such a gender have significant correlations with eating behavior in positive way this explain that increasing score of eating behavior also will increase score of gender (male=0, and female=1) this revealed that female are better in eating behavior practice than male. This is also explained by previous study in western that female and male have difference character in eating behavior, and female more likely can control their eating behavior to keep healthy than man. (Striegel *et al.*, 2009) (Mikolajczyk *et al.*, 2009).

In this current study also highlights that attitude have significant correlations with eating behavior in positive way which means adults people with good attitude have a good eating behavior practice. this result also have consistent result with Hearty (2007) that explained adults who have positive attitude toward healthy food more likely will have good eating behavior practice. (Hearty, 2007).

This study also shown that perceived barriers to consuming healthy food and perceived barriers to avoiding unhealthy food have statistically significant correlations with eating behavior in the negative ways which is mean that more likely adults perceive the barrier related consuming healthy food or avoiding unhealthy food it will occur decreasing of healthy eating behavior. This also have consistent result with Fila and Smith (2006) that explained the unavailability of food in environment can be a barrier to practice healthy eating behavior (Fila and Smith, 2006). And also Noma (2007) explained that lack of support among family and friends can be barrier to adopt healthy eating behavior. (Noma, 2007).

These studies also shown that there are no significant relationships between perceive benefit, age, and educational study with eating behavior. This also shown by the previous study that explained that age, and educational status was almost not having variations with eating behavior (Noma, 2007).

Related with health belief model as the framework of study, the result of this study as shown in table IV revealed that demographic variable including gender and educational level have significant relationship with perceptions which included of perceived benefit, and perceive barrier to consuming healthy food and perceived barrier to avoiding unhealthy food (gender with perceived barrier to avoiding unhealthy food ($r=-0.368$, $p < 0.05$), educational level with perceived benefit ($r=0.164$, $p<0.05$), educational level with perceived barrier to consuming healthy food ($r=-0.127$, $p=< 0.05$)) which is minimum perceived barrier to avoiding unhealthy food can increase likelihood to taking good eating behavior as the recommended action to prevent non communicable diseases. (Perceived barrier to avoiding unhealthy food with eating behavior; $r = -0.475$, $p < 0.05$).

CONCLUSION

This study purposed to determined the factors relating to eating behavior of adults in Tomohon, Indonesia which included age, gender, educational level, attitude, perceive benefit, perceive barrier to consuming healthy food, and perceive barrier to avoiding unhealthy food. This study highlights that eating behavior have significant relationship with gender, attitude, perceive barrier to consuming healthy food, and perceive barrier to avoiding unhealthy food and no associated with age, educational level, and perceived benefit. The limitation of this study is the sampling method was use convenient sampling method that may not representative all adults in Tomohon. The result of this study can be used as the evidence based to develop health promotion and prevention program to adults related with eating behavior to tackling non communicable diseases.

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