Perception of non-communicable diseases predicts consumption of fruits and vegetables

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ABSTRACT

BACKGROUND

Nutrition has come to the fore as one of the major modifiable determinants of chronic disease. Establishing healthy eating habits during adolescence is important given that fruit and vegetable consumption has long-term health-protective benefits. The objective of this study was to investigate the determinant factors of fruit and vegetable consumption habits among Padang inhabitants

METHODS

We conducted a questionnaire-based rapid assessment of 150 respondents who came from different settings: The questionnaire consisted of items on personal characteristics such as age, working status, gender, and personal knowledge of the subjects about the cause of non-communicable diseases (NCDs) and their activities to prevent NCDs. Bivariate analysis was applied to look for variables significantly related to healthy eating (vegetable and fruit consumption). We applied multiple logistic regression to look for the best model to explain factors related to regular fruit and vegetable consumption.

RESULTS

The age range of the subjects was 14 to 76 years, 60% of subjects were women, and 40% were men. The study indicated that 64.7% of the respondents perceived that eating habits relate to NCD, while 67.3% consumed fruits and vegetables regularly. Multivariate logistic regression analysis indicated that gender (O.R.=2.74; 95% C.I. 1.54-5.27) and perception of NCD as being related to healthy eating (O.R.=5.62;95% C.I. 2.93-10.76) were significantly related to regular fruit and vegetable consumption.

CONCLUSION

This study demonstrated that perception of NCD was the most determinant factor of regular fruit and vegetable consumption. Activities to improve practice of regular fruit and vegetable consumption are part of control of NCD risk factors.

Keywords: Non-communicable diseases, perception, fruit and vegetable consumption

Persepsi tentang penyakit tidak menular memprediksi konsumsi buah dan sayur

ABSTRAK

LATAR BELAKANG

Gizi merupakan salah satu faktor determinan penyakit tidak menular yang dapat dimodifikasi. Perilaku makan yang sehat semasa remaja dan dewasa merupakan hal yang penting karena konsumsi buah dan sayur merupakan faktor kesehatan protektip yang berjangka panjang. Tujuan dari studi ini adalah menentukan faktor determinan dari kebiasaan konsumsi buah dan sayur pada penduduk kota Padang.

METODE

Dilakukan penilitian secara cepat dengan menggunakan kuesioner pada 150 responden dari berbagai tatanan kehidupan. Kuesioner terdiri dari beberapa karakteristik penting seperti umur, status kerja, jender, pengetahuan yang berkaitan dengan sebab penyakit tidak menular serta kegiatan mencegah penyakit tidak menular. Analisis bivariat dilakukan untuk menilai variabel yang berkaitan secara signifikan dengan perilaku konsumsi buah dan sayur secara teratur. Lebih lanjut dilakukan analisis regresi logistik ganda untuk menentukan model terbaik yang menjelaskan faktor yang berkaitan dengan konsumsi buah dan sayur secara teratur.

HASIL

Umur dari subjek berkisar antara 14 sampai 76 tahun, 60% responden adalah wanita, dan 40% pria. Sebanyak 64.7% subjek mempunyai persepsi bahwa makanan sehat berkaitan dengan kejadian penyakit tidak menular, 67.3% responden mengkonsumsi buah dan sayur secara teratur. Analisis regresi logistik ganda menunjukkan bahwa jender (O.R.=2.74;95% C.I. 1.54-5.27) dan persepsi tentang penyakit tidak menular (O.R.=5.62;95% C.I. 2.93-10.76) secara signifikan berkaitan dengan konsumsi buah dan sayur secara teratur.

KESIMPULAN

Persepsi tentang penyakit tidak menular merupakan faktor utama yang menentukan perilaku makan buah dan sayur secara teratur. Kegiatan untuk meningkatkan persepsi tersebut perlu dilakukan sebagai bagian dari program penanggulangan faktor risiko penyakit tidak menular.

Kata kunci: *Penyakit tidak menular, persepsi, konsumsi buah dan sayur*

INTRODUCTION

Non-communicable diseases (NCDs), primarily cancers, cardiovascular diseases, chronic respiratory diseases, and diabetes are a leading threat to human health and development in Indonesia. The number of deaths caused by NCDs increased significantly from 41% in 1995 to 59.5% in 2007. The Basic Health Research in 2007 revealed the following prevalences of NCDs as follows: hypertension (31.7%), arthritis (30.3%), heart diseases (7.2%), tumor/cancer (4.3%), asthma (3.5%), diabetes mellitus (1.1%), stroke (0.83%), and injuries from traffic accidents were 25.9%.[1]

NCDs are mostly related to four behavioral risk factors that are linked to globalization, rapid urbanization, economic transition, and poor lifestyles: a) tobacco use, b) poor diet, c) insufficient physical activities, and d) the use

of alcohol.[2] In Indonesia, tobacco use, unhealthy diet (including low vegetable and fruit consumption), and insufficient physical activities are common among the population and have a high prevalence nationwide. On the other hand, alcohol consumption is unusual among Indonesians. The national prevalence of alcohol consumption was only 4.6%[1] and thus will not be discussed in this study.

Nutrition has come to the fore as one of the major modifiable determinants of chronic disease.[3] To prevent the development of chronic disease, decreasing the consumption of energy-dense foods and increasing the consumption of fruits and vegetables during adolescence are important targets for nutrition interventions. The development of effective nutrition interventions requires a detailed understanding of the determinants of target eating behaviors.[4]

The World Health Organization (WHO) has indicated that a low intake of fruits and vegetables is one of the top ten risk factors for global mortality.[5] The Basic Health Research indicated that 93.6% of Indonesians have low fruit and vegetable consumption. Among 33 provinces in Indonesia, Riau had the lowest fruit and vegetable consumption with a prevalence of 97.9%, followed by West Sumatra with a prevalence of 97.8%.[1] A low degree of physical activity is also an issue in Indonesia. Almost half of Indonesians (48.2%)[1] are lacking in physical activities. People are categorized as having sufficient physical activities, if they regularly perform physical activities for 30 minutes per day and for at least a cumulative total time of 150 minutes five days per week. They are categorized as having insufficient physical activities (being less physically active) if the cumulative total time for activities is less than 150 minutes in a week. The highest prevalence of insufficient physical activities was in the provinces of East Kalimantan (61.7%), Riau (60.2%), Banten (55.0%), Jambi (57.8%) and West Sumatera (54.8%).[1]

At Padang Panjang, people have a habit to eat fatty food, and perform few physical activities. These unhealthy lifestyle habits are a major cause of NCDs in the community of Padang Panjang. Therefore, 11.62% of the community has obesity, 10.19% heart disease, 8.14% hypertension, 1.42% stroke, and 2.11% diabetes mellitus.[1]

Padang Panjang is a small municipality in West Sumatra with a population of 51,233 inhabitants. The non-communicable disease prevention programs have been implemented since 2007 and were included in the 2008-2013 mid-term plan of the city as well as the 2008-2013 city health office strategic plan. Sustainability prevention and control of NCDs is reinforced by the social health insurance act (local act 7/2009),[3] smoke-free zone (local act 8/2009) and Mayor regulation 10/2009).[6] There is also a total ban on cigarette sponsorship and outdoor advertising, and integrated community coaching posts for NCDs (*Pos Pembinaan Terpadu Penyakit Tidak Menular)*, have been established in every village since 2009 to function as a place for socializing NCDs prevention efforts (communication, information and education), and conducting screening tests for early detection of NCDs, nutritional consultation, and simple gym exercises.

However, the determinant factors of community knowledge and practices related to control NCDs risk factors are still undefined. These data are important for pinpointing the activities to be done for changing community perception and behavior to prevent NCDs, and can be valuable for NCDs prevention and control at Padang Panjang. Therefore, the objective of this study was to investigate the determinant factors related to fruit and vegetable consumption among the people of West Sumatra Padang city.

METHODS

Research design

This study was done from February 2011 to September 2011 at Padang Panjang, West Sumatra. As part of the case study to look for

socio ecological determinants of health related to NCDs funded by WHO,[7] we conducted a rapid assessment of respondents from five different community settings, namely from the religious community (mosques), student community (high schools), restaurants, public servant (government offices) and integrated community coaching posts for NCDs.

Research subjects

The respondents were persons who understand the Indonesian language and were older 18 years (except for students, where those aged 15 years were included), while persons having non communicable disease (cancer, diabetes mellitus, hypertension and stroke, cardiac disease), vegetarian or frequently practiced fasting during the last year before the interview were excluded from this study.

Data collection

The purpose of this data collection was to determine the knowledge and practices of the subjects in relation to NCD risk factors and to analyzes the determinant factors of activities for prevention of NCDs. At each of the above community settings two trained interviewers asked a given set of questions to 30 people attending these places, who were selected randomly on the day of interview, to give a total 150 respondents. We did not calculate the minimal sample size for this study, since it was not our aim to measure the prevalence of healthy life practice. This study aimed specifically at comparing the knowledge and practice of above five community groups to pinpoint what had been neglected in the NCD awareness campaign.

The questionnaire contained items on personal characteristics, such as age, working status, and gender. In addition to demographical questions, the study raised questions to respondents as follows:

a. On NCD knowledge: What causes a person to be exposed to NCDs (hypertension, stroke, cardiovascular disease, diabetes)?

Possible answers for NCDs knowledge: i) Insufficient exercise; ii) Smoking habits; iii) Eating habits ("eat vegetables and fruits regularly")

b. On NCDs prevention: What have you done to prevent NCD? Possible answers for NCDs prevention: i) Exercise regularly - yes or no; if yes specify every day, every two days, every three day, every four days, every five days, every six days; ii) Reduce/ quit smoking; iii) Healthy eating - specifically eat fruits and vegetables regularly - yes or no; if yes specify every day, every two days, every three days, every four days, every five days, every six days.

Data analysis

The filled-in questionnaires were checked for errors and consistency, and input into the computer for univariate and bivariate analysis. In the bivariate analysis we applied the chi-square test to look for variables significantly related to eating habits (eat vegetables and fruits) and for the variables which were significantly related to eating habits ($p<0.10$). We applied multiple logistic regression to look for the best model to explain factors related to regular fruits and vegetables consumption using SPSS software version 17.0.

RESULTS

Table 1 showed that 60% of respondents were women, 40% were men, within the age range of 14 to 76 years. A total of 27.3% of respondents were older than 30 years, while the groups above 40 years of age amounted to 28.7%. Regarding their occupational status, 20.8% of respondents were housewifes, 34.2% government workers, 24.8% students, and 20.1% self-employed (farmers, laborers and others which we grouped as non-government workers).

Only less than 5% persons were not doing any of the three prevention practices, and about one third (35.5%) did these three prevention practices to prevent NCDs.

Table 1. Characteristics and practice of subjects to prevent NCDs (n=150)

Variables	n (%)
Gender	
Men	60 (40.0)
Women	90 (60.0)
Age (years)	
< 20	34 (22.7)
20-30	32 (21.3)
31-40	41 (27.3)
> 40	43 (28.7)
Working status	
Housewife	31 (20.8)
Government worker	51 (34.2)
Non government worker	30 (20.1)
Student	38 (24.8)
Practice to prevent NCDs §	
Regular physical exercise	20 (13.5)
Not smoking	8 (4.7)
Eat fruits and vegetables regularly	22 (14.9)
Regular physical exercise and not smoking	13 (8.8)
Physical exercise and eat fruits and vegetables regularly	21 (14.2)
Not smoking and eat fruits and vegetables regularly	8 (4.7)
Physical exercise and eat fruits and vegetables regularly and not smoking	51 (35.5)
Not doing the three prevention practices	7 (4.7)

§ NCDs=Non-communicable diseases

Women were significantly more likely to eat fruits and vegetables than men (p=0.002), while housewifes were more likely have healthy food eating habits than government workers, although the difference was statistically not significant (p=0.054) Subjects with perception of NCD significantly eat fruits and vegetables more regularly compared to persons who did not have that perception (p=0.000) (Table 2).

Table 2. Factors related to regular fruits and vegetables consumption (n=150)

Characteristics	Eat fruits and vegetables regularly		
	Yes (%)	No (%)	p value
Gender			
Men	31 (53.4)	29 (46.7)	0.002
Women	70 (77.8)	20 (22.2)	
Age			
< 20 years	27 (79.4)	7 (20.6)	0.212
20-30 years	18 (56.3)	14 (43.7)	
31-40 years	28 (71.8)	11 (28.2)	
>40 years	28 (65.1)	15 (34.9)	
Working status			
Housewife	25 (80.6)	6 (19.4)	0.054
Government worker	29 (59.2)	21 (40.8)	
Non government worker	17 (56.7)	13 (43.3)	
Student	29 (78.4)	9 (21.6)	
Perception of NCDs§			
Yes	78 (82.1)	18 (17.9)	0.000
No	23 (43.4)	31 (36.6)	

§ NCDs=Non-communicable diseases (NCDs)

Table 3. Multiple logistic regression of genders and perception of NCDs on regular fruits
and vegetables consumption

Variables	B*	p value	Odds ratio	95% CI for odds ratio
Gender				
Women	1.011	0.011	2.74	1.43 - 5.27
Men	1			
Perception of NCDs[§]				
Yes	1.726	0.000	5.62	2.93 - 10.76
No	1			

[§] NCDs=Non-communicable diseases; *B= regression coefficient

Further analysis using multiple logistic regression (Table 3) indicated that the practice of regular consumption of vegetables and fruits was significantly related to gender and perception of NCDs. Women were 2.74 times (95% Confidence Interval 1.43 - 5,27) more likely than men to practice regular consumption of fruits and vegetables to prevent NCDs. In addition, persons who perceived that NCDs are related to healthy eating were 5.62 times (95% Confidence Interval 2.93 to 10.76) more likely to practice regular consumption of fruits and vegetables than persons who did not perceive that NCDs is related to healthy food.

DISCUSSION

This main purpose of the present study was to investigate determinant factors related to the habit of eating vegetables and fruits regularly to control risk factors of NCD. The results of this study indicated that the habit of regular fruit and vegetable consumption was affected by gender. Women were significantly more likely than men to have regular fruit and vegetable consumption. Similar results were obtained in an Australian study, where the habit of fruit and vegetable consumption was significantly found among a larger number of women as compared to men.[4] In contrast, in studies conducted in Bangladesh and India, women were more likely than men to have inadequate fruits and vegetables consumption.[8] This suggests that gender also plays a role in food patterns, possibly related to broader cultural differences within the study site.

As pointed out by Narain,[9] NCDs are a global health and developmental emergency, as they cause premature deaths, exacerbate poverty and threaten national economies. Activities to control NCDs will require a broad range of integrated, population-based interventions as well as measures focused on the individuals at high risk.[10]

Our study results demonstrated that subject perception of NCDs play a major role in determining regular fruits and vegetables consumption. The latter is encompassed in an individual's perception on healthy foods, by which is meant consumption of fruits, vegetables and meat, and limitation of sugar, fats and salts, and also variation and moderation.[11]

Data on several important NCDs risk factors pointed out by several authors,[12,13] such as blood pressure, fasting blood sugar, and blood cholesterol, were not collected in our study, because of our limited resources. On the other hand, data on healthy eating and physical activities, reported by many researchers in developing countries as important factors of NCDs, are easily collected by ordinary persons.[14,15] This study would like to look for what strategies had been used in empowering communities for prevention and control of NCDs, specifically focused on diet and individual attitude toward NCDs. In urban areas diet receives much attention, since the majority of people in cities have to buy vegetables at markets, while vegetables are more expensive than snacks. In addition to the work done in other studies, we would like to analyze why some

persons have healthy practices, such as consuming a healthy diet and performing physical activity, while others do not.[16] We realize that there are others factors that contribute to physical activity in urban areas. These factors are grouped into the micro and macro factors, such policy and ecological condition, .and should also be analyzed[17] People can be encouraged to increase their physical activity, especially by walking and bicycling, and by using public transport and not their own motorized transport,[18,19] as well as related to diet such as agricultural policy.[20,21]

The important role of gender is also pinpointed by the World Health Organization (WHO) Commission of Social Determinants, which set up gender for analysis of health inequity.[22] Gender has an important effect on the determinants and consequences of non-communicable diseases and conditions in both developing and industrialized countries.[23] This indicates that a different approach is needed as discussed by Beaglehole et al.[24] We need a comprehensive health system that integrates all common disorders, irrespective of cause and course over time, including NCDs. In the case of Padang, the health agency should facilitate healthy eating in the community to convince people that healthy eating (eating vegetables and fruit regularly) may prevent NCDs in the community through primary health care activities in the community and at Public Health Centers as advised by some researchers.[25] At city level this may be done under the leadership of the mayor in collaboration with associations of restaurants and culinary societies and may be integrated into the agricultural agency as part of improving the consumption of agricultural products, which in turn increase income of farmers. The latter activities will be more likely to be successful if there is strong national policy, such as strong support for the presence of traditional markets. These usually sell fresh vegetables and fruits and can give better access to vegetables and fruits, and thus may be considered an alternative to supermarkets.

Among Ministry of Health policy makers, Padang Panjang is well known for its health promotion activities at community level and the role of healthy city forum. However, the results of this study indicates the importance to explore action on social determinants of health through intersectoral health actions and action at city, district and community level through distal factors such as availability of fresh vegetables and food, social support at community level, leadership at city and district as well as community level for healthy eating with support from agriculture, traditional markets etc. This kind of action has already been discussed elsewhere as part of actions on social determinants of health.[26-28]

Lifestyles and life changes are complex, and depend on the interaction of many different factors over time. Once health problems occur, they last throughout life. NCD prevention requires strategies that are directed at different target age groups.

Apart from all of the above factors, community perception and attitude are also important factors for controlling some disease problems, such as communicable diseases. It is pointed out how irrational knowledge and perception behavior that threatens the effectiveness of public health programs can be tied to public perceptions created by media portrayals of health risk, which is applied to communicable diseases and possibly also to non communicable disease, However this study indicates that the perception of NCDs as being related to healthy eating is an important factor for the practice of healthy eating. This idea to collect data on people's perception to determine rational thinking is in line with the study on communicable diseases which is pointed out the importance of this issue toward public practices.[29]

The present study has some limitations. First, the data are not representative of the population, because we did not calculate the minimum sample size of the respondents. Second, we did not apply random sampling to

the population groups, because our aim was to make comparisons among the five urban groups about their health knowledge and practice. Other limititations of this study was in the collection of data on the practice of fruits and vegetables consumption, which was only qualitative, by asking whether the respondents consumed fruits and vegetables regularly, and how frequent, using the questionnaire used by the Basic Health Research survey. However, the majority of the respondents did not specify the frequency of fruit and vegetable consumption, since the method of data collection was a rapid interview in the field. Therefore we only analyzed if the respondents "eat fruit and vegetables regularly". This limitation is acceptable due to the nature of data collection as a participatory rapid assessment by the community, with the aim to discuss the results with the community for further action, to validate the results and plan for improvement. As a matter of fact one month after the rapid survey, the community groups from each setting discussed the results and made plans for improvement under supervision of the healthy city forum.

CONCLUSION

Women and perception of NCDs were important factors of healthy eating practice ("eat fruits and vegetables regularly") for the prevention of NCDs. Based on this result it is important to implement activities to improve people's perception on the importance of regular fruit and vegetable consumption to control risk factors of NCDs.

ACKNOWLEDGEMENTS

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