

RESEARCH ARTICLE

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Perceived Risk of Developing Cancer in a Suburban Community in Malaysia

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Abstract

Objective: To determine the perceived risk of developing cancer in a suburban community in Malaysia. **Methods:** A cross sectional study using a simple random sampling was conducted among residents aged 18 years old and above (n=520) who had never been diagnosed with cancer, in selected households in a suburban area of Pahang state in Malaysia. The study instruments were a validated questionnaire on risk perception, an automatic blood pressure monitor, a weighing scale and a measuring tape. Data were analyzed using IBM SPSS Statistics for Windows, Version 20.0 and the p value was taken at $p < 0.05$ as significant. **Result:** This study revealed that only 5.0 percent individuals perceived they were at risk cancer, whilst the perceived severity was 41.3 percent. Multivariable analysis showed a significant association only for a family history of cancer (adjusted OR of 4.80; 95% CI = 1.45-15.82) ($p=0.010$) among this population. **Conclusion:** The perceived risk of developing cancer in the selected suburban community of Pahang state in Malaysia is low as compared to that for other non-communicable diseases in this country, whilst the perceived severity was higher than for other diseases. Thus, considering the importance of correct perceptions for behavioral changes, more health education and promotion is needed to make the community better aware of the actual threat of cancer.

Keywords: Perceived risk- cancer-sub-urban- community- Malaysia

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Introduction

Perception is the key to behavior. In health context, among factors which governed individual motivation and willingness to change towards better health related behavior is the perceived risk of developing disease. When this perceived risk is combined with perceived severity, its significant is greater. Misperception on perceived risk of disease will hinder any program aimed towards prevention of disease (Weinsten, 1989; de Zwart et al., 2007; Moldovan and Heald, 2009).

Health Belief Model is the base for individual perceived risk of disease. According to this model, individual motivation towards a healthier behavior can be divided into three categories, namely 1) individual risk perception towards disease, 2) modifying factors such as demography variable and perception of threat of disease and 3) cues to action which is the cues which trigger action such as media information and symptoms of disease. The combination of these factors will lead to likelihood of taking certain actions to prevent disease (Galloway, 2003; University of Twente, 2010). In this current study, only the first and second categories under the health belief model were studied namely risk perception and demography variables.

In term of disease, in Malaysia, the five most common non-communicable diseases, NCDs were hypertension, diabetes, heart disease, stroke and cancer. Cancer was also listed among the 10 most common cause for hospital admission and 10 most common causes of deaths in both Ministry of Health, MOH and private hospitals for the year 2012 and 2013 (Health Fact, 2012; Health Fact, 2013). In term of cost, colorectal cancer for example, the mean cost of treatment per year in Malaysia is about RM 20,831.36 (USD 4880.26) with range between RM 17,624.77 to RM 24,225.15 (USD 4129.03 to USD 5675.33) and this cost increased as the stage of cancer also increased (Natrah et al., 2012).

In view of the significant role of cancer in Malaysia and the perceived risk of disease as enabling mechanism for future disease prevention action, therefore, this study was conducted to determine perceived risk of developing cancer among the sub-urban community in Malaysia.

Materials and Methods

Residents aged 18 years and above who have never been diagnosed with cancer in the selected households in Federal Land Development Authority settlement (FELDA) in sub urban area of Pahang, Malaysia were included after

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obtaining written consent.

FELDA is a land development and relocation program with the objective of poverty eradication through the cultivation of oil palm and rubber. The main reason for choosing this place of study is because of its population composition whereby the settlers came from all over Malaysia. Therefore this help to ensure the homogeneity of data collected.

These selected respondents (selection using simple random sampling) were asked to complete a validated questionnaire which is developed to evaluate the risk perception on developing non communicable diseases in Malaysia (Hafizah et al., 2013).

In addition, body weight and height were also obtained in order to get the body mass index (BMI) of respondent. Body weight and height were measured with respondents standing with light garments and barefooted. Height was measured using a measuring tape which was suspended upright against a straight wall. The visual display showed the person's height and this was recorded to the nearest tenth of a centimetre. Body weight was measured using a Salter weighing scale with an accuracy of 0.5 kg. BMI was calculated as weight in kg, divided by height in meter squared (m²). On measuring blood pressure, an automated blood pressure monitor OMRON Model HEM-7203 was used with an accuracy of 3 mmHg. Average of two measurements was taken for analysis.

Data gathered were then analysed by using Statistical Package for Social Sciences Programme (SPSS) for Windows, Version 20.0. Frequency distribution and descriptive analysis were used to determine the perceived risk of developing cancer. Further analyses involved using odds ratio to determine the association between the different variables.

Results

Socio-demographic characteristics of respondents

Socio-demographic characteristics of the respondents are shown in Table 1. All of the respondents completely answered the questionnaire, thus all of the 520 data obtained were analysed. Results showed that majority of the respondents were female (69.2 percent), Malay ethnicity (86.5 percent) with the mean age of 37.06 years old (standard deviation 14.03). Most of the respondents have attained formal education up to the secondary school level (55.0 percent), males were mostly FELDA settler (36.9 percent) while females were mostly housewives (63.1 percent) with household income between RM 1,000 to RM 3,000 a month (82.1 percent).

Results also showed that majority of the respondents (male : 58.1 percent and female: 39.2 percent) were at the normal BMI category (between 18.5 to less than 25 kg/m²) but females have mean of slightly over the normal limit (25.51 ± 5.59 kg/m²). As for their systolic and diastolic blood pressure, mean systolic blood pressure was 125.49 (± 20.16) mmHg and mean diastolic blood pressure was 75.77 (± 12.43) mmHg.

Descriptive analysis of perceived risk of diseases, perceived severity of diseases and family history of cancer

In the descriptive analysis, results showed that 5.6

Table 1. socio- demographic characteristic of Respondents

Socio-demographic characteristic	n	Mean (standard deviation)	Percentage (%)
1. Age (years)	520	37.06 (14.03) (minimum =18, maximum= 73)	
2. Age category (years)			
18-<35	268		51.5
35-65	242		46.5
More than 65	10		1.9
3. Gender			
Male	160		30.8
Female	360		69.2
4. Ethnic group			
Malay	502		86.5
Aborigine	15		2.9
Indian	1		0.2
Others	2		0.4
5. Highest formal education attained			
No formal education	19		3.7
Primary school	119		22.9
Secondary school	286		55
College/University	96		18.5
6. Occupation (Male):			
FELDA settlers	59		36.9
Government servant	23		14.4
Private company	26		16.2
Self employed	20		12.5
Not working (student/ not employed)	32		20
Female:			
Housewives	227		63.1
Government servant	42		11.7
Private company	23		6.4
Self employed	16		4.4
FELDA settlers	1		0.3
Not working (student/ not employed)	51		14.1
7. Household income/ month (RM)			
Median		RM 1,500	
Interquartile range:			
25%		RM 1,100	
50%		RM1,500	
75%		RM1,500	
8. Household income category			
<RM1,000	71		13.7
RM1,000-RM3,000	427		82.1
RM3,001-RM5,000	21		4
>RM5,000	1		0.2
9. Body mass index (BMI) (mmHg)			
Male		24.12 (4.66)	
Female		25.51 (5.59)	
10. Body mass index category (BMI) (mmHg)			
Male			
<18.5 (underweight)	13		8.1
18.5-<25 (normal)	93		58.1
25-<30 (overweight)	31		19.4
≥30 (obese)	23		14.4

Table 1. Continued

Socio-demographic characteristic	n	Mean (standard deviation)	Percentage (%)
Female			
<18.5 (underweight)	32		8.9
18.5-<25 (normal)	141		39.2
25-<30 (overweight)	112		31.1
≥30 (obese)	75		20.8
11. Systolic blood pressure (mmHg)		125.49 (20.16)	
12. Systolic blood pressure category (mmHg)			
<120	205		39.4
120-139	212		40.8
≥ 140	100		19.2
13. Diastolic blood pressure (mmHg)		75.77 (12.43)	
14. Diastolic blood pressure category (mmHg)			
<80	313		60.2
80-89	131		25.2
≥ 90	73		14

percent of respondents have family history of cancer. In regards to perceived risk of disease, high perceived risk for cancer among this population was 5.0 percent which was the lowest as compared to other diseases listed (hypertension 6.2 percent, diabetes 10.4 percent, heart disease 9.4 percent and stroke 5.2 percent). Conversely, the perceived severity for cancer was 41.3 percent which was the highest as compared to other diseases (hypertension 13.3 percent, diabetes 9.0 percent, heart disease 16.9 percent and stroke 19.4 percent) (Table 2).

Factors associated with perceived risk of having cancer

Focusing on cancer, chi square (χ^2) test was then performed to determine the association between perceived risk of developing cancer and the associated factors listed (Table 3). Results showed that the factors which significantly associated with perceived risk of developing cancer were level of education, employment status (male) and family history. Those respondents with high education level have higher perceived risk for cancer (6.3 percent) than those with low level of education (1.4 percent) and at the odds of 4.56 times greater ($\chi^2 = 4.99$ (1), $p= 0.026$). As for employment status, more unemployed male respondents (12.5 percent) have higher perceived risk for cancer with odds of 6.00 times greater ($\chi^2 = 6.38$ (1), $p= 0.012$) compared to employed respondents (2.1 percent). The final factor which is the family history of cancer showed that less respondents with no family history (4.5 percent) (odds ratio of 0.29 and 95% confidence interval of 0.09 to 0.92) had higher perceived risk for cancer compared to those who have family history of cancer (13.8 percent) ($\chi^2 = 4.99$ (1), $p= 0.025$).

Other factors such as age, gender, ethnicity, employment status (female), household income, BMI, systolic and diastolic blood pressure were all noted to have no significant association with the perceived risk of developing cancer. Further analysis of data using binary logistic regression analysis after controlling for other variables including age, sex and ethnic group to assess the strength of the association between the perceived risk

Table 2. Descriptive Analysis of Perceived Risk of Diseases, Perceived Severity of Diseases and Family History of Cancer

Variables	n	Percent (%)
1. Perceived risk of having diseases:		
a. Cancer:		
High	26	5
Low	494	95
b. Hypertension:		
High	84	16.2
Low	436	83.8
c. Diabetes:		
High	54	10.4
Low	466	89.6
d. Heart disease:		
High	49	9.4
Low	471	90.6
e. Stroke:		
High	27	5.2
Low	493	94.8
2. Perceived severity of diseases:		
a. Cancer:		
High	215	41.3
Moderate	124	23.8
Low	181	34.9
b. Hypertension:		
High	69	13.3
Moderate	151	29
Low	300	57.7
c. Diabetes:		
High	47	9
Moderate	200	38.5
Low	273	52.5
d. Heart disease:		
High	88	16.9
Moderate	345	66.3
Low	87	16.8
e. Stroke:		
High	101	19.4
Moderate	220	42.3
Low	199	38.3
3. Have close relatives (parents,/siblings) with cancer:		
Yes	29	5.6
No	491	94.4

of developing cancer with variables that had a p value of < 0.05 was then performed. Results of the the analysis showed that only family history showed significant relationship with perceived risk of having cancer (adjusted odds ratio of 4.80 and 95% confidence interval of 1.45 to 15.82) ($p=0.010$).

Table 3. Factors Associated with Perceived Risk of Having Cancer

Variables	High perceived risk for cancer, n (percent)	Low perceived risk for cancer, n (percent)	Pearson χ^2 test (df)	Prevalence odds ratio (95% CI)	P value
1. Age category (years)					
18-<35	17 (6.3)	251 (93.7)	2.380 (2)	1	0.304
35-65	9 (3.7)	233 (96.3)		0.57 (0.25- 1.31)	
More than 65	0 (0.0)	10 (100.0)		0 (0)	
2. Gender					
Male	7 (4.3)	154 (95.7)	0.209 (1)	1	0.648
Female	19 (5.3)	340 (94.7)		1.23 (0.51- 2.99)	
3. Ethnic group					
Malay	26 (5.2)	476 (94.8)	0.981 (1)	1	0.322
Non-Malay	0 (0.0)	18 (100.0)		0 (0)	
4. Formal education attained					
Lower	2 (1.4)	136 (98.6)	4.986 (1)	1	0.026*
Higher	24 (6.3)	358 (93.7)		4.56 (1.06- 19.55)	
5. Profession category					
Male:					
Employed	3 (2.1)	126 (97.9)	6.382 (1)	1	0.012*
Unemployed	4 (12.5)	28 (87.5)		6.00 (1.27- 28.32)	
Female:					
Employed	6 (7.4)	75 (92.6)	0.933 (1)	1	0.334
Unemployed	13 (4.7)	265 (95.3)		0.61 (0.23- 1.67)	
6. Household income					
≤ RM 2,000.00	22 (4.9)	423 (95.1)	0.021 (1)	1	0.886
> RM 2,000.00	4 (5.3)	71 (94.7)		1.08 (0.36- 3.24)	

df, degree of freedom; 95%CI, 95% confidence interval; *two sided P.value<0.05

Discussion

Findings from this study showed that the percentage of those who have high perceived risk for cancer among this population was 5.0 percent which is the lowest as compared to other diseases listed (high perceived risk for stroke was 5.2 percent, heart disease was 9.4 percent, diabetes was 10.4 percent and hypertension was 16.2 percent). Among the possible explanation for this is, as majority of the respondents were Muslims, by stating that

cancer as a probable disease to be contracted as if they were asking for the disease from God. Previous studies (Sabir and Ikram, 2009; Aasim et al., 2014; Marlow et al., 2014) also discussed about how sometimes individuals interpret disease as a manifestation of God's punishment because diseases such as cancer are very much related to individual's high risk behaviors.

In addition, cancer also seems to be familial which explained why the binary logistics regression analysis showed that only family history has significant

Table 4. Binary Logistic Regression Analysis for Association between Perceived Risk of Having Cancer with Associated Factors

Variables	β value	Standard of error	Wald statistics(df)	Adjusted OR	95% confidence interval	p value
1. Formal education attained						
Lower	1.25	0.78	2.55 (1)	1	(0.75- 16.14)	0.11
Higher				3.49		
2. Profession category						
Male:						
Employed	0.14	0.48	0.08 (1)	1	(0.45- 2.94)	0.777
Unemployed				1.15		
3. Have close relatives (parents./siblings) with cancer:						
Yes	1.57	0.61	6.61 (1)	4.8	(1.45- 15.82)	0.010*
No				1		

df, degree of freedom; OR, odds ratio; *two sided P.value<0.05

relationship with high perceived risk of having cancer. This finding is supported by previous studies (Emeott et al., 2005; Spector et al., 2009; Posluszny and Baum, 2010) that showed the percentage of high risk of having disease among those with family history was between 45.0 percent to as high as 89.0 percent as compared to those without family history of cancer.

In regards to perceived severity of disease, of the five diseases listed in this study, the analysis showed that the majority of respondents think that cancer is the worst disease if they ever contracted the disease, followed by heart disease, stroke, diabetes and lastly hypertension. This finding is interesting because it showed that public have a perceived severity of disease which is almost similar to the 10 leading causes of death (non-communicable diseases) in hospitals in the year 2013 which are diseases of the circulatory system (disease includes heart disease and stroke) (24.7 percent) followed by cancer (13.6 percent) and endocrine, nutritional and metabolic diseases (including diabetes) (2.1 percent) (Health fact, 2013). In addition, news, advertisement and even soap opera always portray stories of people with cancer who were treated especially at late stage with the effect of chemotherapy that contribute to these high perceived risk for cancer.

Comparing these findings with a study by Wang et al., (2008) who investigated the perception of risk, severity and anxiety of the four main diseases in the United States, results showed that stroke is the disease with the highest perceived severity by both male and female respondents, followed by heart disease, cancer, and lastly diabetes. This finding was in contrary to the fact released by the Disease Control Division of the United States that heart disease is the leading cause of death in the country.

Focusing on the level of education, result of this study showed that respondents with higher formal education attained (secondary school, college and university) has higher perceived risk of having cancer as compared to respondents with no formal education or education up to primary school. This finding contradicts a study conducted by Anuar et al., (2009) among workers in health laboratories whereby his results showed that respondents with lower levels of education have higher perceived risk of getting disease than their counterpart who have higher education level. Another study linked the level of education and perception of risk of having disease also supported the findings by Anuar et al., (2009). The study by Krewski et al., (2006) among Canadians showed that respondents with lower education level always have the perception of getting the disease which is higher.

Lastly, in regards to the relationship between employment status among male respondents and perceived risk of cancer, previous studies (Kim et al., 2008; Olokoba et al., 2010) also tried to relate employment status with disease perception. Finding from this study showed that those who were unemployed have higher perceived risk for cancer as compared to those who were employed. This finding is parallel to the study by Kim et al., (2008) whereby risk perception for cancer was higher among those who were unemployed.

Among limitations that were identified in this study is that respondents may not be able to recall

certain information that causes recall bias and only one settlement area were involved in this study. In addition, the instruments used were only questionnaire and physical measurement. Therefore, for recommendation for future study, it will be better to include other FELDA settlement areas and add biochemical investigations as measurement tools to match respondent's actual risk with their perception.

In conclusion, this study revealed that the perceived risk of developing cancer among a sub-urban community in Pahang, Malaysia is low as compared to other non-communicable diseases in this country, whilst the perceived severity of cancer is higher as compared to other diseases among this population. Thus, considering the importance of correct perception in order to govern behavioral changes, more health education and promotion are needed to make the community aware of the threat of cancer.

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Statement conflict of Interest

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

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