
PUBLIC HEALTH RESEARCH

Promoting Malaysians to Spend on Health: What It Takes to Encourage Malaysians to Spend on Health Promotion?

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ABSTRACT

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Introduction In light of the important role of health-promoting expenditure in health, the objective of this study was to investigate the socio-demographic determinants of health-promoting expenditure such as purchase of medical equipment and services, food supplements and health education services and products among Malaysian adults.

Methods Third National Health and Morbidity Survey (NHMS III) consisting of 28771 observations was used for analysis. It was the latest nationally representative cross-sectional population-based survey conducted by the Ministry of Health Malaysia from April 2006 to January 2007. A censored regression model (Tobit) was applied to examine the factors affecting health-promoting expenditure.

Results The results showed that age, income, gender, ethnicity, education, marital status, employment status and location of residence were able to affect health-promoting expenditure. In particular, individuals who were younger, poor, males, Indian/others, less educated, unmarried, unemployed and residing in rural areas tended to spend less money on health promotion compared to others.

Conclusions This study reached a conclusion that socio-demographic factors were significantly associated with individual's preferences for health promotion. Therefore, the government should devote its attention to these factors when formulating nationwide health policies.

Keywords Demography - disease - health promotion - lifestyle - prevention.

INTRODUCTION

Non-communicable chronic diseases (NCDs) such as diabetes mellitus, cancer and cardiovascular diseases are becoming more prevalent nowadays. World Health Organization¹ reported that NCDs are responsible for 36 million of mortalities annually. Worse still, 25% of these mortalities are premature deaths, accounting for 9 million of total mortalities worldwide. In Malaysia, around 20 thousand of government hospital admissions in year 1990 were associated with hypertension induced diseases, and this figure had doubled to 40 thousand in year 2005². The prevalence of hypertension in Malaysia had increased from 4.2 million in 2006 to 5.8 million in 2012.³ Furthermore, Edwards & Lim³ reported that there was an increase of 3.5 million in the prevalence of hypercholesterolemia in Malaysia from 2006 to 2012. Worst of all, Malaysia was ranked fourth highest country with diabetic patients in Asia, which had 800000 reported cases over the year 2007⁴. In spite of these alarming evidences, a lot of people still engage in an unhealthy lifestyle. World Health Organization¹ estimated that 13.2 million of NCDs related deaths yearly are caused by unhealthy lifestyle. Studies to date have consistently found that unhealthy lifestyle can significantly increase the risks of acquiring NCDs⁵⁻⁸.

Health-promoting lifestyle is defined as the practice taken by people to improve their health, for example participation in physical activity, healthy diet and use of health supplements. Drawing on the data of developed countries, Duffy⁹, Fleming et al.¹⁰, Johansson et al.¹¹, Pullen et al.¹², Al-Kandari¹³ and Paulik et al.¹⁴ have consistently found that socio-demographic factors such as age, gender, income, education and ethnicity can significantly affect individuals' decision to live a health-promoting lifestyle. In particular, Pullen et al.¹² used a sample consisting of 102 respondents in Nebraska and found that younger individuals have a higher propensity to spend more time participating in health-promoting lifestyle compared to older individuals. Paulik et al.¹⁴ exploited a population-based health survey data of Hungary and found that males have a lower likelihood of engaging in health-promoting lifestyle than females. Using a sample comprising 477 respondents in Texas, Duffy⁹ observed that married individuals are more likely to participate in health-promoting lifestyle compared to their unmarried counterparts. Although there is a growing number of a study examining the causal relationship between socio-demographic factors and health-promoting lifestyle, there appears to be no study focusing on this topic in Malaysia. Therefore, the main objective of this study is to narrow this research void. This study attempts to contribute to the existing literatures and society in several

manners. First, the focus of this study is on Malaysia, where NCDs are prevalent and no studies exist. Second, this study exploits a nationally representative secondary data consisting of a large sample size and detailed information on individual's socio-demographic and health profile for a robust analysis. Third, this study sets out to investigate the socio-demographic determinants of individuals' health-promoting expenditure, which is the topic that the current literature is still silent on. Health-promoting expenditure refers to out-of-pocket health expenditures incurred by healthy individuals to improve their health and prevent diseases, which include the purchase of medical equipment and services, food supplements and health education services and products¹⁵. Fourth, the findings of this study can provide the public policy makers with the baseline information on formulating an appropriate population-based intervention measure towards reducing the prevalence of NCDs.

METHODS

Data

Data used in this study is from the Third National Health and Morbidity Survey (NHMS III). It is the latest nationally representative cross-sectional population-based survey conducted by the Ministry of Health Malaysia from April 2006 to January 2007. The data covers all the urban and rural areas in Malaysia. Following the sampling frame from the Department of Statistics Malaysia, a two stage stratified sampling approach with proportionate to the size of population was used to collect the data. The first stage sampling unit was based on geographically contiguous areas of the country [Enumeration Blocks (EB)]. The second stage sampling unit was based on the Living Quarters (LQ) in each EB, and all the households and individuals that were within the selected LQ were canvassed.

During the survey, the piloted bi-lingual (*Bahasa Malaysia* and English) questionnaires were used by the trained health professionals to interview (face-to-face) the respondents. Meanwhile, the respondents' blood pressure, blood cholesterol and blood sugar were examined. The inclusion criteria were: (1) all adults aged 18 years old and above; (2) all gender; (3) all ethnic groups; and (4) Malaysian citizen. The target sample size was calculated based on several criteria: (1) 95% confidence interval; (2) the prevalence and response rate of Second National Health and Morbidity Survey (NHMS II); and (3) the calculated margin of error and design effect. The calculated target sample size was 34539 respondents, which represented 12923504 Malaysian adults. The overall response rate was 100%. More detailed information about this data was described elsewhere.¹⁵

Variables

This study uses the respondent's monthly out-of-pocket health-promoting expenditure [in Ringgit Malaysia (RM)] as the dependent variable. It is measured as continuous outcomes with numerical values. Health-promoting expenditure refers to the health expenditures made by the healthy individuals to prevent diseases and improve health such as use of medical equipment, food supplements and health education services and products.¹⁵ The independent variables of this study are selected based on the previous studies investigating the factors affecting health-promoting lifestyle.^{9-14,16-17} In particular, the included independent variables are: (i) age; (ii) income; (iii) gender; (iv) ethnicity; (v) education; (vi) marital status; (vii) employment status; and (viii) location of residence.

Statistical analysis

By using the cross-sectional survey data, a problem that usually occurs is the existence of zero expenditure reported by large observations in the sample, meaning that the data consists of a lot of respondents do not spend for health promotion. In other words, the data has information on all the respondents' socio-demographic profile (independent variables) but not the amount of health-promoting expenditure (dependent variable). In this case, health-promoting expenditure is referred as the censored variable, and it is censored at the limit value of zero expenditure (i.e. RM 0). Therefore, to deal with such problem, a censored regression model (tobit) is applied in this study to examine the factors affecting individuals' health-

promoting expenditure¹⁸. Meanwhile, Likelihood Ratio (LR) test is conducted to examine the goodness-of-fit of the regression model. Additionally, correlation coefficients between income and education variables are calculated in order to diagnose the potential multicollinearity problem. Of the total sample, only 28771 (83.3%) observations are retained for statistical analysis due to incomplete information reported by some. All the statistical tests are considered significant if the p-values are below 5% at 2-sided level.

RESULTS

Characteristics of the survey respondents

Of the total 28771 respondents, only 6889 (23.9%) spent money on health promotion, whereas 21882 (76.1%) did not. The average age of the respondents was approximately 41.29 years old. The median monthly individual income was RM 1400. Of the total sample, 43.3% were males and 56.7% were females. The ethnic breakdown comprised 56.6% Malays, 21.1% Chinese and 22.3% Indians/others. Approximately 51.8%, 37.9% and 10.3% of the respondents had secondary, primary and tertiary education, respectively. About 71.0% of the respondents were married, 21.4% were single and 7.6% were widow(er)/divorced. Of the total respondents, 61.7% were employed and 38.3% were unemployed. The majority of the respondents (58.3%) resided in urban areas, whereas the minority (41.7%) resided in rural areas (Table 1).

Table 1 Descriptive analysis of variables in the statistical model

Variables	Percentage / mean (SD) / median (IQR)		
	Those who spent money on health promotion (n1 = 6889)	Those who did not spend money on health promotion (n2 = 21882)	Total sample (N = 28771)
Age	40.82 (13.28)	41.44 (15.92)	41.29 (15.33)
Income	2000 (2300)	1200 (1482)	1400 (1800)
Gender			
Male	36.3	45.5	43.3
Female	63.7	54.5	56.7
Ethnicity			
Malay	62.6	54.7	56.6
Chinese	21.4	21.0	21.1
Indian/others	16.0	24.3	22.3
Education			
Primary	23.3	42.5	37.9

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Secondary	57.2	50.1	51.8
Tertiary	19.5	7.4	10.3
Marital status			
Married	77.1	69.0	71.0
Single	16.6	22.8	21.4
Widow/divorce	6.2	8.1	7.6
Employment status			
Employed	68.2	60.1	61.7
Unemployed	31.8	39.9	38.3
Location of residence			
Urban	65.4	56.1	58.3
Rural	34.6	43.9	41.7

Note: For age, the value refers to mean (SD), for income, the value refers to median (IQR), whereas for other variables, the value refers to percentage. SD refers to standard deviation. IQR refers to interquartile range.

Factors affecting health-promoting expenditure

The results illustrate that the LR χ^2 with 11 degrees of freedom was 2680.35, and the p-value was less than 0.001. Thus, the null hypothesis was rejected and it was concluded that the current regression model was very good fit. Further, the estimated

correlation coefficients between income and education variables were all less than 0.8, indicating there was no serious multicollinearity problem in the current regression model (Table 2)¹⁹.

Table 2 Results for tobit analysis of health-promoting expenditure

Variables	Estimated coefficient	Standard errors	t-statistic	p-value
Age	17.86	1.55	11.53	< 0.001
Income	0.09	0.01	16.41	< 0.001
Gender				
Male	-591.03	36.60	-16.15	< 0.001
Female*	-	-	-	-
Ethnicity				
Malay	401.02	42.01	9.55	< 0.001
Chinese	340.46	50.99	6.68	< 0.001
Indian/others*	-	-	-	-
Education				
Primary	-1794.86	62.39	-28.77	< 0.001
Secondary	-777.18	48.92	-15.89	< 0.001
Tertiary*	-	-	-	-
Marital status				
Married*	-	-	-	-
Single	-552.71	47.27	-11.69	< 0.001
Widow/divorce	-232.55	66.83	-3.48	< 0.001

Employment status				
Employed	428.34	38.08	11.25	< 0.001
Unemployed*	-	-	-	-
Location of residence				
Urban	182.04	34.77	5.23	< 0.001
Rural*	-	-	-	-
Constant	-1729.31	92.45	-18.71	< 0.001
LR χ^2 (11)	2680.35			
P> χ^2	< 0.001			
Observations	28771			

Note: LR refers to Likelihood Ratio. * refers to reference/base category.

Age was found to have a positive effect on health-promoting expenditure, as an additional year of age increased the money spent on health promotion by RM17.86 ($\beta = 17.86$; $p < 0.001$). Likewise, income was positively associated with health-promoting expenditure, as an increase of RM1 in monthly individual income raised the money spent on health promotion by RM0.09 ($\beta = 0.09$; $p < 0.001$). By holding other variables constant, males spent RM591.03 less money on health promotion than females ($\beta = -591.03$; $p < 0.001$). Comparing among the ethnic groups, Malays spent the highest amount of money on health promotion, followed by Chinese, as the results showed that Malays ($\beta = 401.02$; $p < 0.001$) and Chinese ($\beta = 340.46$; $p < 0.001$) spent RM401.02 and RM340.46 more money on health promotion, respectively, compared to Indians and others. Levels of education were positively associated with health-promoting expenditure as primary ($\beta = -1794.86$; $p < 0.001$) and secondary educated individuals ($\beta = -777.18$; $p < 0.001$) spent RM1794.86 and RM777.18 less money on health promotion, respectively, compared to their tertiary educated peers. In terms of marital status, singles and the widowed or divorced had lower preferences for health promotion than the married, as the results showed that single ($\beta = -552.71$; $p < 0.001$) and widow(er)/divorced individuals ($\beta = -232.55$; $p < 0.001$) spent RM552.71 and RM232.55 less money on health promotion, respectively, relative to married individuals. Health promotion was more favourable to employed individuals than unemployed individuals, given the findings that employed individuals spent RM428.34 more money on health promotion than the unemployed ($\beta = 428.34$; $p < 0.001$). With regard to location of residence, urbanites spent RM182.04 more money on health promotion than rural dwellers if other variables were held constant ($\beta = 182.04$; $p < 0.001$).

DISCUSSION

Drawing on a nationally representative data of Malaysia, this study had found that age, income, gender, ethnicity, education, marital status, employment status and location of residence could significantly affect health-promoting expenditure. Specifically, individuals who were younger, poor, males, Indian/others, less educated, unmarried, unemployed and rural dwellers tended to spend less money on health promotion compared to others. Based on these findings, several public policies directed at increasing the use of health-promoting goods and services were suggested.

The current result suggested that older individuals were inclined to spend more money on health promotion compared to younger individuals, which lent support to the findings of Duffy⁹ and Al-Kandari et al.¹³ that age had a positive impact on the likelihood of engaging in health-promoting lifestyle. A plausible reason was that as age increases, thus so were the risks of suffering from diseases. Hence, older individuals were likely to be more aware of the consequences of ill health, and consequently would be more inclined to use health-promoting goods and services.²⁰ With regard to policy implication, on top of banning all sorts of alcohol and tobacco related advertisements, the Ministry of Health Malaysia should utilise various types of mass-media such as radio, newspaper and television to advertise the risks of NCDs with particular attention on the youngsters.

Higher income individuals were found to spend more money on health promotion than lower income individuals. These outcomes were in agreement with the evidences of Paulik et al.¹⁴, Riediger & Moghadasian¹⁶ and Whiting et al.¹⁷ that participation in healthy behaviours and consumption of dietary supplements were more prevalent among high income earners. Perhaps, this was because low income posed as a profound barrier to health promotion given that health-

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promoting goods and services such as dietary supplements, medical products and health courses were all expensive to be consumed. In view of these phenomena, the Ministry of Health Malaysia was therefore suggested to use the alcohol and tobacco tax revenue to provide wider health coverage for the poor by subsidising the basic health-promoting goods and services. Besides, the government should also encourage third parties such as non-government organizations (NGO) and charity bodies to provide free-of-charge health courses and seminars for the public.

The finding of this study submitted that females tended to spend more money on health promotion than males, which was somewhat consistent with the findings of Robroek et al.²¹ that female workers were more likely to participate in workplace health promotion programmes, as well as, the findings of Duffy⁹ and Fleming et al.¹⁰ using a data of western countries. Since women had the natural family caretaker characteristic, which men were usually lacking in, women tended to be more concerned about the risks of diseases and the importance of health promotion. Therefore, the public policy makers should urgently introduce more nationwide health awareness programmes to advertise the potential benefits of health promotion with a specific focus on males.

There was a causal relationship between ethnicity and health-promoting expenditure as Malays and Chinese tended to spend more money on health promotion compared to Indians and those of other ethnic groups. This finding led to conclude that there were cultural, racial-political and religious differences in demand for health promotion. However, such conclusion may have to be further confirmed by the future qualitative studies focusing primarily on ethnic differences in health promotion. In terms of policy implication, intervention measures directed toward Indians and those of other ethnic groups to increase the awareness of health promotion may seem effective. The government could consider using health professionals such as medical doctors, pharmacists and nurses from Indians and other ethnic groups to play the role as spokespersons to highlight the importance of health promotion.

It was found that higher educated individuals tended to spend more money on health promotion than lower educated individuals. These observed outcomes complied with the findings of Ricciuto et al.²² based on the case of Canada, as well as Wandel²³ and Johansson et al.¹¹ using a nationwide data of Norway. The reason could be due to the fact that well-educated individuals had better knowledge about the benefits of health promotion and the risks of acquiring chronic diseases²⁴. Hence, well-educated individuals may tend to have a higher preference for health promotion than those of low educated. In the light

of these evidences, the Ministry of Health Malaysia was suggested to pay special attention to the low educated segments of population. Among the recommended interventions included introducing more physical education and health subjects to the primary and secondary schools, providing health-related reading materials for the public, and organising nationwide health education campaigns.

Rather consistent with the findings of Al-Kandari et al.¹³, married individuals were found to spend more money on health promotion than unmarried individuals. These findings were also shared by Kato et al.²⁵, which found married men to be more likely to consume health supplements. The plausible reason was that married individuals tended to carry more responsibilities to look after their family, and thus were more aware of their own health and the importance of health promotion compared to those of unmarried²⁶. Therefore, it could be concluded that family commitment posed as an incentive for married individuals to improve their health.

Employment status was found to have a significant impact on health promotion as employed individuals tended to spend more money on health promotion in relative to their unemployed peers. Two plausible reasons may explain these outcomes. First, employed individuals were more financially independent, and thus had the ability to allocate more money for health promotion. Second, employed individuals often participated in workplace health promotion programmes, and consequently may have better information on the importance of health promotion.

Urbanites were found to spend more money on health promotion compared to rural dwellers, which were consistent with the findings of Johansson et al.¹¹ and Fogelholm et al.²⁷ based on the case of Europe. A lack of educational institutions and health care facilities in the rural areas may be the contributing factor for this outcome¹⁷. In other words, rural dwellers tended to face more constraints in using health-promoting goods and services, most notably health courses, dietary health supplements and medical products. Nevertheless, the prevalence of NCDs in rural areas was lower as compared to urban areas. Hence, rural dwellers may not spend much on health promotion because they tended to be healthier. Besides, rural dwellers may use traditional herbs or plants for their health, and thus were less likely to purchase health promotion products.

CONCLUSIONS

In conclusion, this study had thrown new light on the factors affecting health-promoting expenditure among adults in Malaysia. The findings of this study were similar to those of other studies focusing on the case of developed countries^{9-14,16-17}. It was, however, that given the limited

availability of data, several inherent limitations were noted. First, this study was not able to link with other factors such as smoking, drinking and participation in physical activity due to several inherent limitations including limitation of data on these factors. Second, this study could not analyse the health-promoting expenditure according to the types of goods and services. Therefore, with data

availability, future studies should take account of these shortcomings.

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Appendix 1 Correlation coefficient between income and education variables

Variables	Primary	Secondary	Tertiary
Income	-0.204 (0.000)	0.025 (0.000)	0.284 (0.000)

Note: P-value in parentheses.

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