

Public Health Behaviour-Change Intervention Model for Jamaicans: Charting the Way Forward in Public Health

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Abstract: Health education and health promotion are driven based on understanding lifestyle practices of a population. The aims of the study are to construct health care demand and health promotion models, which are appropriate to the Jamaican population, and to determine the predictors of health care demand. The current research extracted a sub-sample of 16,619 respondents from the survey, the Jamaica Survey of Living Conditions (JSLC), based on those who indicated having sought medical care in Jamaica. The sub-sample was taken from a nationally cross-sectional survey of 25,018 respondents from the 14 parishes in Jamaica. It was administered by the Planning Institute of Jamaica and the Statistical Institute of Jamaica between July and October 2002. A self-administered questionnaire was used to collect the data. Majority of the respondents did not have private health insurance coverage (88.2%); 53.6% had a partner; and 35.2% were poor; 50.4% had at most primary level education. The predictors of health care demand are: health care demand in previous period (t-1) (OR = 0.049); illness (OR = 10.338); injury (OR = 2.370); social class (middle class: OR = 1.135; wealthy: OR = 1.394); per capita consumption (OR = 1.099); union status (OR = 0.845); gender (OR = 2.221); private health insurance coverage (OR = 1.942); age (OR = 1.022) and educational attainment of respondents (OR = 1.315). This study can be used to model critical health promotion emphasis in Jamaica, and any other country with similar socio-demographic and political characteristics.

Key words: Public health, behavior change, health education, Jamaica

INTRODUCTION

Health, wellbeing and wellness are multidimensional issues and the concept of health according to the World Health Organization (WHO) is multifaceted. Health is defined as the state of complete physical, mental and social wellbeing, and not merely being the absence of disease or infirmity (WHO, 1948). Health status is an indicator of wellbeing, which is a state of happiness where an individual has positive feeling status and experiences life satisfaction (Diener, 1984; Diener *et al.*, 1985).

It is from the definitions of health that public health behavioural change programmes are designed and fashioned in seeking to create 'good' health for people within different cultures. There are many theories that are applied to individual health behaviour-change (Glanz *et al.*, 2002; Elder, 2001). King *et al.* (1995) and colleagues argued that these are not relevant for populations in 'traditional communal cultures'. In addition to the limitation offered by King *et al.* (1995) study, they omitted the dominance of Western psychological theories that are from developed countries and the fact that they are based on an understanding of the individual's cognitive process than about intervention.

These theories are not for developing nations that have unique characteristics and culture. Cohen and colleagues developed a model for behaviour change using structural modeling which addresses physical structures, social structures, cultural and media messages (Cohen *et al.*, 2000). They had broad parameters for public health behaviour-change interventions, there are two critical limitations to their study. These were established for developed nations and despite modifications for developing countries they are no model developed specifically from data for developing nations or the Caribbean and in particular Jamaica. Second, the model omits to emphasize personality and cognition in public health behaviour-change intervention. Elder (2001) noted that health communication and learning theories are culturally specific, and are relevant for developing countries.

The biomedical model which has long been argued by the WHO (1948) and Engel (1960) as early as in the 1940s and the 1960s respectively are regarded as too narrow and have been replaced by a broader construct, the biopsychosocial model developed in the United States by Engel (1978) and Longest (2005). Among the plethora of theories or models that are used in Caribbean health education strategies such as Health Belief Model; Theory

of Reasoned Actions; Theory of Planned Behaviour; Transtheoretical Model and Stages of Change, the Precaution Adoption Process Model (with some modifications), none are indigenous to Jamaica and other countries in the Caribbean. According to Glanz and colleagues, while it is reasonable to assume that a theory such as Health Belief Model is applicable to different cultures, it also is important to realize that constructs may have to be adapted to make them more relevant to the target culture (Glanz *et al.*, 2002). Modification of these theories may not be the most appropriate approach to the care of patient. Therefore there is the need to develop a health care model that is indigenous to Jamaica and other countries in the Caribbean.

Health education and health promotion are driven based on understanding lifestyle practices of the population, and so it is important to investigate the determinants of health care demand in Jamaica. Therefore the authors recognized the need for a discourse on health assessment in addition to the image of health and how this influence health education and health promotion. Understanding this concept should provide an insight into the use of practices by health educators and health promoters in the Jamaica and by extension the Caribbean. The aims of this paper construct health care demand and health promotion models, which are appropriate to the Jamaican population, and to determine the predictors of health care demand.

METHODS

The current research extracted a sub-sample of 16,619 respondents (66%) from the survey at the Jamaica Survey of Living Conditions (JSLC, 2002), based on those who indicated having sought medical care in Jamaica. The decision to study only those who sought medical care was based primarily on the lack of literature on health demand in the island. The sub-sample was taken from a nationally cross-sectional survey of 25,018 respondents from the 14 parishes in Jamaica. The survey used stratified random probability sampling technique to draw the 25,018 respondents. The non-response rate for the survey was 29.7% accounted for by 20.5% who did not respond to particular questions, 9.0% who did not participate in the survey and another 0.2% who was rejected due to data cleaning. The study was conducted between June and October, 2002. The study was commissioned by the Planning Institute of Jamaica (PIOJ) and the Statistical Institute of Jamaica (STATIN) (2002). The two organizations are responsible for planning, data collection and policy guideline for the country. The researchers selected this survey because it was the second largest sample size for the survey in its history (since 1988 to 1998), and in that year, the survey had questions on crime and victimization, and the physical environment unlike previous years. Moreover, in order to establish a model that is comprehensive, the researcher used this

dataset as health status is a multidimensional tenet and so requires more variables than less in order to examine this model. However, for the current work, the researcher used descriptive statistics to provide background information on demographic characteristics of the sub-sample population.

The JSLC was born out of the World Bank's Living Standard Survey. The JSLC began in 1988 when the PIOJ in collaboration with STATIN adopted with some modifications of the World Bank's Living Standards Measurement Study (LSMS) household surveys. The JSLC has its focus on policy implications of government programmes, and so each year a different module is included, evaluating a particular programme. The JSLC is a self-administered questionnaire where respondents are asked to recall detailed information on particular activities. The questionnaire covers demographic variables, health, immunization of children 0 to 59 months, education, daily expenses, non-food consumption expenditure, housing conditions, inventory of durable goods, and social assistance. Interviewers are trained to collect the data, which is in preparation of the household members.

All statistical analyses were performed using SPSS 16.0 software for Widows. Descriptive statistics such as frequency, mean and standard deviation were used to provide background information on the sample. A single hypothesis was tested, which is 'health demand of Jamaicans is a function of demographic, social, psychological and economic variables.' The initial variables that were selected for this study are based on literature as well as factors identified in the theoretical framework. The enter method in logistic regression was used to test the hypothesis in order to determine those factors that influence health status of rural residents. Logistic regression was used as dependent variable is a binary one. Categorical variables were coded using the 'dummy coding' scheme.

Results were presented using un-standardized B-coefficients, Wald statistics, odds ratio and confidence interval (95% CI). The predictive power of the model was tested using Omnibus Test of Model and Homer and Lemeshow (2000) was used to examine goodness of fit of the model. The correlation matrix was examined in order to ascertain whether autocorrelation (or multi-collinearity) existed between variables. Based on Cohen and Holliday (1982) correlation can be low (weak), from 0 to 0.39; moderate, 0.4 to 0.69, and strong, 0.7 to 1.0. This was used to exclude (or allow) a variable in the model. Wald statistics was used to determine the magnitude (or contribution) of each statistically significant variable in comparison with the others, and the odds ratio (OR) for interpreting each significant variable.

The current study will test the hypothesis in Equation 1 (ie Model 1) to determine those factors that are significant ($p < 0.05$), as those are the only ones that will constitute the final model:

$$HD_i = f(ED_i, U_i, I_i, C_i, X_i, HS_i, J_i, SS_i, \ln A) \quad (1)$$

The health care demand (health care seeking behavior) of person *i*, HD_i , is a function of ED_i , the educational level of person *i*; U_i , the union status of person *i*; I_i , the duration of or severity of the illness of person *i*; C_i , the consumption per capita of person *i*; X_i , the sex of the person *i*; HS_i , the ownership of life insurance of person *i*; J_i , injuries or dysfunction of person *i*; SS_i , the social class (proxy by poverty quintile) of person *i* and A_i , the age of person *i*, with $\ln A_i$ being the log age.

The model for health education in Jamaica is based on the inverse for Health Demand Model and is given as:

$$HP_i = \frac{1}{f(HDi, z)} \quad (2)$$

Where HP_i is the health education of person *i*, which is an inverse function of HD_i and some error term, ϵ .

$$HP = 1/ f(Ei, Ui, Ii, Ci, Xi, HSi, Ji, SSi, lnA, \epsilon) \quad (3)$$

RESULTS

The sample comprised of 16,619 respondents (48.6% men and 51.4% women); with a mean age of 39.75 years (SD = 19.05 years); majority did not have private health insurance coverage (88.2%); 53.6% had a partner; and 35.2% were poor; 50.4% had at most primary level education (Table 1).

In examining predictors of health care demands of Jamaicans, ten variables were found to be significant. These were health care demand in previous period (t-1) (OR = 0.049); illness (OR = 10.338); injury (OR = 2.370); social class (middle class: OR = 1.135; wealthy: OR = 1.394); per capita consumption (OR = 1.099); union status (OR = 0.845); gender (OR = 2.221); private health insurance coverage (OR = 1.942); age (OR = 1.022) and educational attainment of respondents (OR = 1.315) (Table 2). The model [Eqn (1)] had a statistical significant predictive power ($\chi^2 = 1,249.19$ $p = 0.001$; Homer and Lemeshow (2000) goodness of fit $\chi^2 = 5.606$, $p = 0.691$). In addition, it was revealed that overall 70.0% ($n = 9,810$) of the data were correctly classified: 52.7% ($n = 3,358$) of those who indicated health demand and 84.4% ($n = 6,452$) of those who indicated no health care demand (Table 2).

The final health care demand model of Jamaicans, the health care demand (Eq. 1) constitute education, union status (ie marital status), duration of illness or severity, consumption, gender, injury, subjective social class, and age of respondents. Illnesses contributed the most (i.e. Wald statistic = 969.89; OR = 10.338) to health demand. Interpreting the OR for illnesses revealed that individuals who are ill for a longer period of time would be 10 times more likely to demand health care compared to those who are ill for a shorter period. Furthermore, a positive β value

Table 1: Socio-demographic characteristics of sample

Particular	Frequency	Percentage
Gender		
Male	8078	48.6
Female	8541	51.4
Educational level		
Primary	7294	50.4
Secondary	6045	41.7
Tertiary	1142	7.9
Health insurance		
Yes	1919	11.8
No	14292	88.2
Union Status		
With a partner	8544	53.6
Without a partner	7395	46.4
Social status		
Poor	5844	35.2
Middle	6762	40.7
Rich	4013	24.1
Age (Mean \pm SD)	39.75 years \pm 19.05 years	

Table 2: Logistic regression of health demand and some explanatory variables

Particular	Coefficient	SE	Wald	Odds ratio
Illnesses	2.336	0.075	969.894	10.338***
Injuries	0.863	0.181	022.655	2.370***
Social class			001.000	
†Poor	0.127	0.056	005.128	1.135*
Middle				
Wealth	0.332	0.050	044.601	1.394***
Per capita Consumption	0.094	0.030	010.117	1.099***
Union status	- 0.169	0.040	018.024	0.845***
Gender	0.793	0.039	418.533	2.221***
Health insurance	0.664	0.064	106.383	1.942***
Log age	0.022	0.001	359.375	1.022***
Education	0.274	0.085	010.332	1.315***
Constant	- 3.024	0.319	089.691	0.049***

Nagelkerke R-squared 28.4%

Overall correct classification = 70%

Correct classification of cases of reported health demand = 52.7%

Correct classification of cases of no health demand = 84.4%

†Reference group

*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

of 2.336 indicates that as persons move from no illnesses to illnesses, they will seek more health-care. Given that the logit is positive for illnesses, being ill increases the odds of seeking health care.

The constant in the current study indicates preventative care, and it showed that Jamaicans were 4.4% likely to demand health care owing to rationale of some socio-demographic characteristics or non-disease condition. With regard to injuries, an individual who has injuries is 2 times more likely to seek health care compared to someone who does not have injuries (OR = 2.370). Furthermore, a positive β value of 0.863 indicates that with the increasing number of injuries, the sampled population sought more health care (or health care behaviour increases). A p value 0.001 with a positive logit for injuries suggests that being injured increases the odds of seeking health care.

There is a significant relationship between gender and health care behaviour ($p = 0.001$; Table 2). Based on

the Wald statistic, (418.53), gender is the second most important factor in predicting health care behaviour. In addition, a positive β value of 0.793 indicates that females sought more health care in comparison to males. Furthermore, a positive logit in relation to gender suggests that being female increases the odds of seeking health care. Females are likely to demand health twice as much as their male counterparts.

DISCUSSION

The demand for health is important and critical in health education and health promotion, as it provides a platform upon which health practitioners can plan. There are a number of studies that have examined health promotion in various Caribbean countries. This study can be used as model for health care demand and health promotion in Jamaica, and any other country with similar socio-demographic and political characteristics. The predictors of health care demand using the proposed model were illness, injury, social class, consumption, union status, gender, private health insurance, age and educational attainment of the respondents.

Health care demand or health seeking behaviour in terms of illness refers to those activities undertaken by individuals in response to symptoms experience (Tones, 2004) and is influenced by a large number of factors apart from knowledge and awareness (Lurie *et al.*, 1995). This behaviour among different populations, particularly in the rural communities in which most Jamaicans reside, is a complex outcome of many factors operating at individual, family and community level including their bio-social profile, their past experiences with the health services, influences at the community level, availability of alternative health care providers including indigenous practitioners and last but not the least their perceptions regarding efficiency and quality of the services. Belief systems prevalent in the communities i.e. how people conceptualize the etiology of health problem and how symptoms are perceived is an important factor in deciding the first step of treatment seeking (Lurie *et al.*, 1995). In 1993, a behaviour risk factor survey was conducted in Jamaica to provide a baseline for tracking health-related behaviours in the adult population (Figueroa *et al.*, 1999). The survey included self-reported data on health-seeking behaviour, chronic diseases, substance abuse, injuries and violence and reproductive health. The survey found a high prevalence of self-reported hypertension (with 62% not on treatment), of heavy alcohol use by men, of possible obesity among women and of sexually transmitted disease.

The type of symptoms experienced for the illness and the number of days of illness are major determinants of health seeking behaviour and choice of care provider. Lack of resources obstructs adequate treatment, and favour illness recrudescence and prolongation, which ultimately increase the cost of health care. Long duration

or concentration of illness episodes in a household especially in rural Jamaica can lead to selling of available assets and other coping strategies (e.g. borrowing money), pushing the household into the vulnerability spiral. Illness can end up being extremely costly for the poor (Corbett, 1989). In general, the economic burden of illness can have a double impact on poor households. Firstly, it can have an impact on health if individuals see themselves forced to interrupt treatment because of lack of financial resources, leading to increased vulnerability in terms of health. And secondly, when coping strategies lead to a process of impoverishment, a household is placed in a position of vulnerability in terms of material survival.

Social class was the third predictor of health care demands of Jamaicans. Direct and indirect treatment costs are among the most commonly mentioned obstacles to adequate health-seeking behaviour of the poor for obtaining prompt and adequate treatment, treatment compliance and access to preventive measures (Worrall *et al.*, 2002). In April 2007, the Ministry of Health in Jamaica established free health care for all Jamaicans. However, even if direct costs are affordable, or if medical services are free, indirect costs (for transport, special food) can limit access to treatment or lead patients to interrupt therapies (Abel-Smith and Rawal, 1992). Treatment costs are not only an obstacle for adequate health seeking of the poor; they also signify a higher burden for the poorer households compared to the more affluent. Even if the poor spend less or equal amounts on coping with illness, the percentage of the monthly or annual income is higher among the poor. More wealthy Jamaicans are more likely to opt for private services. Health care in the private sector, which is easily accessible and seen as delivering better quality services, is much more expensive and is largely supported by direct out-of-pocket payments and private health insurance (Gumber and Berman, 1995). Therefore financial barriers affect care-seeking behaviour, with the wealthy most likely to use specialist facilities while the poor typically use more non-specialist primary care facilities (Falkingham, 2004)

Education appears to have a positive association with seeking health care. Lawson found that for both men and women there is a gradual increase in the demand for health care upon completion of some primary education through to university education (Lawson, 2004). Men and women who possess a university education are more likely to demand formal health care, relative to those with no education. There also appears a quite distinct trend away from government hospital facilities to those privately provided, as the educational attainment of adults increases, potentially supporting Li's hypothesis for Bolivia, that the educated transfer away from government health care because they regard its quality as inferior (Li, 1996). However, other studies have found that higher educated people are healthier and are therefore less likely to consume health care (Grossman and Kaestner, 1997;

Hammond, 2002). If a higher educated person has a health-impairment, an individual is more likely to seek medical assistance sooner. Higher educated people are also more informed and more assertive about the opportunities and the possibilities to obtain medical help, which also increases the chance of health care use (Groot and Maassen, 2007). There have been reports that lower levels of education appear to be associated with underreporting of illness by patients (Mackenbach *et al.*, 1996).

In this study age was the eighth predictor of health care demand. In a study done in Georgia by Gotsadze and colleagues, increased income, age and perceived seriousness of the illness were all statistically significant factors increasing the probability of seeking health care (Gotsadze *et al.*, 2005). They found that individuals (aged 66 years and older) were three times more likely to seek care than the youngest group (aged 0-3 years). In addition, patients who perceived their illness to be moderately serious had higher odds of seeking care and, to a lesser degree, so did those who perceived their illness to be very serious. The richest were almost five times more likely to seek care than the poorest quintile (Gotsadze *et al.*, 2005). Other qualitative research in Georgia suggests that financial considerations, the perceived professionalism of a provider and the geographic location of the provider are the three main criteria influencing patients' choice (Belli *et al.*, 2004).

Financial resource availability plays an important role in health care decisions and demands. The resources regarding health care decision-making could be health insurance or monetary resources. Health insurance is important for access to health care and being uninsured significantly reduces access to health services and substantially increases health problems. Uninsured persons with poor health status are much more likely than their insured counterparts to report that they or a family member did not receive doctor's care or prescription medicines (Families USA, 2000). Shi reported that income was the most significant predictor of lack of health insurance coverage (Shi, 2001). Low-income adults tended to have lower health status and uninsured adults tended to have problems accessing health care services (Wyn and Solis, 2001). Mead *et al.* (2001) noted that low-income adults were less likely to have health insurance, while they were more likely to have health care access problems, chronic illness and lower overall health status than their richer counterparts (Mead *et al.*, 2001). In Jamaica, Life of Jamaica and Blue Cross Jamaica Limited are the only total health insurance companies catering to the widest cross-section of Jamaica's population. These companies offer a wide range of health insurance products to best suit the needs of clients from individuals, students, executives, associations and companies. The purchase of private health coverage among Jamaican residents is based on work situation and to a lesser extent on the premise that an individual is likely to be ill. This can be seen as coverage against the risk of becoming ill.

In order to develop this model the authors assumed that health education and health promotion must not emphasize the strengths found in the health care demand model, but must emphasize on low health demand and vice versa. Embedded in the health promotion and health education model, the health care promotion model is the inverse relationship between health care demand and health promotion. Given that duration or severity of illness accounted for 42%, the longer individuals are ill and the more severe the ailment is, they are 42% more likely to demand health care, and therefore health promotion must be concerned with those who are less likely to attend than more likely. Hence, health promotion should target those who are less likely to demand health care in order to encourage or create healthy behaviour as against those persons who displays good health behaviour. The results from this study should serve as a guide and provide health practitioners with information on the areas of emphasis in health education and promotion, which need to be addressed, using probability from the health demand model.

CONCLUSION

The predictors of health care demand using the proposed model were illness, injury, social class, consumption, union status, gender, private health insurance, age and educational attainment of the respondents. In addition, embedded in the health care promotion and health education model is the fact that the health promotion model is the inverse relationship between health care demand and health promotion. Illness contributed the most to the health care demand model, indicating that the longer individuals are ill and the more severe the ailment is, they are more likely to demand health care. Therefore, health promotion must be concerned with those who are less likely to seek health care. Hence, health promotion should target those who are less likely to demand health care in order to encourage or create healthy behaviour as against those persons who displays good health behaviour. The results from this study should serve as a guide and provide health practitioners with information on the areas of emphasis in health education and promotion, which need to be addressed, using the health care demand model.

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