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Rural health in Jamaica: examining and refining the predictive factors of good health status of rural residents

PA Bourne[1], DA McGrowder[2]

[1]Department of Community Health and Psychiatry, [2]Department of Pathology Faculty of Medical Sciences, University of the West Indies, Kingston, Jamaica, West Indies

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Bourne PA, McGrowder DA

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ABSTRACT

Introduction: Poverty is mainly concentrated in rural areas. Rural populations also generally experience excessive deficiencies in healthcare access, social services, and other goods and services needed for healthy living. This study investigated the health status and determining factors of Jamaican rural residents in order to provide healthcare practitioners and policy makers with research findings to assist in effectively addressing health in rural Jamaica.

Methods: The current research used a sub-sample of 15 260 respondents. The sub-sample was taken from a national cross-sectional study of 25 018 respondents from the 14 parishes of the island. The survey from which the present study is drawn used a stratified random probability sampling technique to draw the 25 018 respondents. Descriptive statistics were used to provide background information on the demographic characteristics of the sub-sample population. The model will be established using logistic regression using statistically significant (p <0.05) variables.

Results: The sub-sample population of this study constituted 15 260 respondents of which 99.1% responded to the gender question. Of the 99.1%, 50.7% were males and 49.3% females. It was found that 17.2% of the population reported poor health (n = 2554), 82.8% (n = 12 285) reported good health and 5.9% (n = 873) reported private health insurance coverage. The model used had statistically significant predictive power (model χ^2 = 15939.9, p <0.001; Hosmer and Lemeshow goodness of fit,

χ^2 = 14.46, p = 0.71). It was found that 85.1% (n = 4738) of the data were correctly classified. Of those with good health, 97.2% (n = 4387) were correctly classified, while of those with poor health, 38.6% (n = 451) were correctly classified. Some 12 factors can be used to predict the health status of rural residents in Jamaica with $\chi^2(28)$ = 1595.03, p <0.001; -2 Log likelihood = 4181.232, which accounted for 38.4% of the variability in health status. An examination of the predictors revealed that the six most influential in descending order were: health insurance coverage (Wald statistic = 492.556; OR = 0.044, 95% CI: 0.033-0.058, p <0.001); age of respondents (Wald statistic = 222.211; OR = 0.957, 95% CI: 0.951-0.962, p < 0.001); secondary level education (Wald statistic = 28.403; OR = 0.580, 95% CI: 0.475-0.709, p <0.001); gender (Wald statistic = 27.804; OR = 1.602, 95% CI: 1.345-1.909, p <0.001); negative affective conditions (Wald statistic = 14.608; OR = 0.949, 95% CI: 0.924-0.975, p <0.001) and positive affective conditions (Wald statistic = 12.208; OR = 1.063, 95% CI: 1.027-1.100, p <0.0010), and number of children in the household (Wald statistic = 11.850; OR = 1.141, 95% CI: 1.058-1.230, p <0.01).

Conclusions: The study showed that approximately 83% of rural residents reported good health, and the 12 factors accounted for 38% of the variability in good health. Of the 12 factors, ownership of health insurance was the most significant and this is negatively associated with good health status. The other factors that are predictors of health status of rural residents included age, secondary level education, gender of respondents, and negative and positive affective psychological conditions. Within the context of high poverty and the role of health seeking behaviour of rural residents on health status, there is a need to use an inter-sectoral approach to accomplish better quality of life through improved health status.

Key words: education, health insurance, health status, Jamaica, poverty, rural residents.

Introduction

Much emphasis has been placed on cities because of communicable diseases, malnutrition, mental illnesses, chronic respiratory diseases, inadequate food and shelter crisis, crowding, poor waste disposal, environmental pollution[1-2]. In 1950, 30% of the world lived in urban areas and this increased to 43% in 2000. In 1950, urbanization in more developed countries was approximately 45% and this substantially increased to approximately 75% in 2000. Urbanization in North America was 64% in 1950 and had marginally increased to 77% in 2000. This is a not limited to more developed societies. In Africa urbanization increased from 14% in 1950 to 38% in 2000. In Asia, urbanization increased from 17% in 1950 to 37% in 2000; while in Latin America and the Caribbean, urbanization was 41% in 1950 with an exponential increase of 34% by 2000. Similarly, urbanization in Europe in 1950 was 52% and this increased significantly by 23% in 2000[3]. In Jamaica, there has been a steady increase in urbanization from 49.6% in 1991, to 52.0% in 2001 and 60% in 2005[4-5].

Since the mid-1990s, there has been a general decline in the poverty rate in Jamaica from 27.5% in 1995 to 19.7% in 2002. However, the 2002 figure represented an increase from 16.7% in 2001. In that year the poverty incidence returned to the 1997 level, indicating an upward trend since 1999[6]. Poverty is mainly concentrated in rural areas, with children (0–18 years) most adversely affected. For example, in 2002 children accounted for 47.8% of those living in poverty although they represented only 38.9% of the population[7]. Poverty is directly related to health conditions[8] because it prevents access to particular resources and explains the poorer milieu in poor communities. Pacione[9] has shown that the physical environment affects health conditions, and other studies have established the relationship between poverty, the milieu and health conditions or health status[10].

Health status (or health condition) is defined as the number of self-reported ailments, illnesses, dysfunctions, injuries and physical discomforts that an individual experiences[10]. Those who are poor attend healthcare facilities because of respiratory ailments, skin fungi and other health conditions associated with a poor physical environment. According to statistics from the Planning Institute of Jamaica (PIOJ)[5], the leading cause of primary healthcare visits in 2004 was respiratory tract disease, suggesting that poor milieu results in increased visits to healthcare facilities.

Rural populations generally experience excessive deficiencies in healthcare access, social services and other goods and services needed for healthy living. Rural residence has significantly influenced healthcare access and health status. Urban residents consistently reported better health status than rural residents, and greater satisfaction with their health care[11]. Rural residents are more often uninsured[12], have a greater distance to travel for their healthcare needs[11] and are more often plagued by resource inaccessibility[13]. A greater proportion of people from the rural population in Jamaica reported having chronic illnesses, with a smaller population having insurance of any kind (7.6% in rural areas vs 25.0% in urban areas)[6]. Furthermore, 23% of people from rural Jamaica who reported having a chronic illness were not actively engaged in seeking health care because of affordability issues, compared with 9.4% from urban areas.

There is a lack of literature on the phenomenon of rural health in Jamaica. Increased health research on Jamaica's rural residents in will provide valuable information to guide future planning. This study investigated the health status of rural residents in Jamaica, and the factors that determine their health status, in order to provide health-care practitioners and policy-makers information to assist addressing rural healthcare needs.

Methods

Participants and questionnaire

The current research extracted a sub-sample of 15 260 respondents (61% of the survey) who indicated they lived in rural parishes in Jamaica. This sub-sample was taken from a national cross-sectional survey of 25 018 respondents from the Jamaica's 14 parishes. The survey used a stratified random probability sampling technique to drawn the original 25 018 respondents. The non-response rate for the survey was 29.7%, with 20.5% not responding to particular questions, 9% not participating in the survey, and another 0.2% rejected due to 'data cleaning'. The study used secondary cross-sectional data from the Jamaica Survey of Living Conditions (JSLC). The JSLC was commissioned by the PIOJ and the Statistical Institute of Jamaica (STATIN). These two organizations are responsible for planning, data collection and policy guideline for Jamaica. Descriptive statistics provided background information on the demographic characteristics of the sub-sample population.

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 0–59 months, education, daily expenses, non-food consumption expenditure, housing conditions, inventory of durable goods and social assistance. Interviewers are trained to collect the data from household members. The survey is conducted between April and July annually.

Model

The multivariate model used in this study (a modification of those of Grossman[14] and Smith & Kington[15]) captures a multi-dimensional concept of health and health status. The present study added new factors such as psychological conditions, crowding, house tenure, number of people in the household and a deconstruction of the numbers by particular characteristics (ie males, females and children aged

≤14 years). Another fundamental difference from the research of Grossman[14] and Smith and Kington[15] is that the current research was area-specific (ie it focused on rural residence and thus the majority of the poor in Jamaica). The proposed model that this research seeks to evaluate is displayed (Eqn1):

$$H_t = f(P_{mc,}\ ED,\ R_{t,}\ A_{t,}\ Q_{t,}\ HH_{t,}\ C,\ E_{n,}\ MS,\ HI,\ HT,\ SS,\ LL,\ X,\ CR,\ DI,\ O,\ (\sum NP_{i,}\ PP_i),\ M,\ N,\ FS,\ A_{i,}\ \varepsilon_i) \quad [1]$$

Variables were identified from the literature. Using the principle of parsimony, only those explanatory variables that are statistically significant (p <0.05) were used in the final model to predict current health status of rural residents in Jamaica. This final model investigated the self-reported good health of rural Jamaicans (Eqn2).

$$H_t = f(\ln P_{mc,}\ ED_{i,}\ R_{t,}\ HI_{i,}\ HT_{i,}\ X_{i,}\ CR_{i,}(\Sigma NP_{i,}\ PP_i),\ M_{i,}\ F_{i,}\ N_{i,}\ A_{i,}\ \varepsilon_i) \quad [2]$$

The current good health status of a rural resident, H_t, is a function of 12 explanation variables, where H_t is current good health status of person i, if good or above (ie no reported health conditions in the 4 weeks leading up to the survey period), 0 if poor (ie at least one health condition reported); lnP_{mc} is the logged cost of medical care of person i; ED_i is the educational level of person i, 1 if secondary, 1 if tertiary and the reference group is primary and below; R_t is the retirement income of person i, 1 if receiving private and/or government pension, 0 if otherwise; HI_i is the health insurance coverage of person i, 1 if they have a health insurance policy, 0 if otherwise; H_i is the house tenure of person i, 1 if rent, 0 if squatted; X_i is the gender of person i, 1 if female, 0 if male; CR_i is crowding in the household of person i; $(\sum^{2}_{i=1} NP_i PP_i)NPi$ is the sum of all negative affective psychological conditions, and PPi is the sum of all positive affective psychological conditions; M_i is the number of males in the household of person i and F_i is the number of females in the household of person i; A_i is the age of the person i and N_i is the number of children in the household of person i; LL_i is the living arrangements, where 1 = living with family members or relatives, and 0 = otherwise.

Measures

An explanation of some of the variables in the model is provided here. Health status is a dummy variable, where 1 (good health) = not reporting an ailment or dysfunction or illness in the last 4 weeks, which was the survey period; 0 (poor health) if there were no self-reported ailments, injuries or illnesses. While self-reported ill-health is not an ideal indicator of actual health conditions because people may underreport, it is still an accurate proxy of ill-health and mortality[16-17]. Social supports (or networks) denote different social networks with which the individual is involved (1 = membership of and/or visits to civic organizations or having friends who visit ones home or with whom one is able to network, 0 = otherwise). Psychological conditions are the psychological state of an individual, and this is subdivided into positive and negative affective psychological conditions[18-19]. Positive affective psychological condition is the number of responses with regard to being hopeful, optimistic about the future and life generally. Negative affective psychological condition is number of responses from a person on having lost a breadwinner and/or family member, having lost property, being made redundant, or failing to meet household and other obligations.

Statistical analysis

Statistical analyses were performed using the Statistical Packages for the Social Sciences v 16.0 (SPSS Inc; Chicago, IL, USA) for Widows. Descriptive statistics included frequency, mean and standard deviation used to provide background information on the sample. A single hypothesis was tested, which was: the health status of rural residents is a function of demographic, social, psychological and economic variables. The enter method in logistic regression was used to test the hypothesis in order to determine those factors that influence the health status of rural residents. The logistic regression used as dependent variable was binary.

The final model was based on those variables that were statistically significant (p <0.05), and all other variables were removed from the final model (p >0.05). Categorical variables were coded using the 'dummy coding' scheme.

The predictive power of the model was tested using the 'omnibus test of model' and Hosmer and Lemeshow's[20] technique was used to examine the model's goodness of fit. The correlation matrix was examined in order to ascertain whether autocorrelation (or multi-collinearity) existed between variables. Cohen and Holliday[21] stated that correlation can be low/weak (0–0.39); moderate (0.4–0.69), or strong (0.7–1). This was used in the present study to exclude (or allow) a variable. Finally, Wald statistics were 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 of the significant variables.

Results

The sub-sample population of this study constituted 15 260 respondents of which 99.1% responded to the gender question. Of the 99.1%, 50.7% were male and 49.3% female. One-half of the population was between the ages of 25 and 59 years with 20% being elderly (aged 60 years and over). The majority of the population had secondary education (73.0%, n = 6402); approximately two-thirds were never married (66.6%, n = 6436); 47.8% (n = 7298) were poor, of which 51% were in the poorest-poor categorization (ie below the poverty line). Moreover, 17.2% of the population reported poor health status (n = 2554); 82.8% reported good health status (n = 12285), 5.9% (n = 873) had private health insurance coverage; approximately 2% were receiving retirement income (n = 275) and 43.8% (n = 6680) indicated having social support (Table 1).

The model used in the study had a statistical significant predictive power (model χ^2 = 15939.9, p <0.001; Hosmer and Lemeshow's goodness of fit χ^2 = 14.46, p = 0.71). On examining the classification table, it was found that 85.1% (n = 4738) of the data were correctly classified. Of those with good health, 97.2% (n = 4387) were correctly classified; while of those with poor health, 38.6% (n = 451) were correctly classified (Table 2). There was no multi-collinearity among variables because the correlation matrix has correlations of less than 0.7. The correlation between average consumption of foods and non-alcoholic beverages, and average income per person per household was moderate (r = 0.614). The correlation between income and asset ownership was r = 0.019, and between asset ownership and consumption r = -0.033. The correlation between living arrangements and social support was r = 0.048; marital status and living arrangements r = 0.187; marital status and social supports r = 0.037; and marital status and income r = 0.248. In addition, the association between age and marital status was 0.324.

Some 12 factors can be used to predict the health status of rural residences in Jamaica with $\chi^2(28)$ = 1595.03, p <0.001; -2 log likelihood = 4181.232 which accounted for 38.4% of the variability in health status (Table 2). An examination of the predictors revealed that the six most influential in descending order were health insurance coverage (Wald statistic = 492.556; OR = 0.044, 95% CI: 0.033–0.058, p <0.001); age of respondents (Wald statistic = 222.211; OR = 0.957, 95% CI: 0.951–0.962, p <0.001); secondary level education (Wald statistic = 28.403; OR = 0.580, 95% CI: 0.475–0.709, p <0.001); gender (Wald statistic = 27.804; OR = 1.602, 95% CI: 1.345–1.909, p <0.001); negative affective conditions (Wald statistic = 14.608; OR = 0.949, 95% CI: 0.924–0.975, p <0.001) and positive affective conditions (Wald statistic = 12.208; OR = 1.063, 95% CI: 1.027–1.100, p <0.0010) and number of children in household (Wald statistic = 11.850; OR = 1.141, 95% CI: 1.058–1.230, p <0.01). The two least potent predictors were home tenure/rented house (Wald statistic = 6.106; OR = 0.069, 95% CI: 0.008–0.576, p <0.05) and retirement income (Wald statistic = 4.183; OR = 0.620, 95% CI: 0.392–0.980, p <0.001).

Table 1: Demographic characteristics of sampled population – rural residence in Jamaica

Variable	N (%)
Gender	
Male	7727 (50.7)
Female	7524 (49.3)
Retirement income	
No	14924 (98.2)
Yes	275 (1.8)
Health status	
Poor	2554 (17.2)
Good	12285 (82.8)
Health insurance coverage	
No	13875 (94.1)
Yes	873 (5.9)
Per capita income quintile	
Poorest	3724 (24.4)
Poor	3574 (23.4)
Middle	3169 (20.8)
Wealthy	2774 (18.2)
Wealthiest	2017 (13.2)
Living arrangement	
Living with family or relative	14170 (92.9)
Living alone	1088 (7.1)
Social support	
No	8580 (56.2)
Yes	6680 (43.8)
Educational level	
Primary and below	2061 (23.5)
Secondary	6402 (73.0)
Tertiary	302 (3.4)
Marital status	
Married	2460 (25.5)
Never married	6436 (66.6)
Divorced, separated or widowed	770 (7.4)
Crowding (person; mean ± SD)	2 ± 1.4
Age (years; mean ± SD)	29.1 ± 22.6

The OR for health insurance (0.044) implies that the odds of good health status of rural residents declines by approximately 4% for those with health insurance coverage. Similarly, the OR of 0.957 implies that the estimated odds of good health declines by approximately 96% for each additional year that a rural resident lives. An OR of 0.580 implies that rural residents with secondary education were 58% less likely to have good health, compared with those with primary education, and there was no statistical difference between those with primary level education and tertiary level education. However, an OR of 1.60 implies that the estimated odds of self-reported good health improve by approximately 60% for rural men. If sampling error was taken into consideration for gender of residents, using the confidence interval of 1.345 to 1.909, the estimated odds increase by at least 35% for rural men than rural women (Table 2).

Table 2: Logistic regression of rural health of Jamaicans by some explanatory variables

Explanatory variables	Coefficient	Std. error	Wald statistic	*P*-value	Odds ratio	95.0% CI	
						Lower	Upper
Poor quintiles†							
Middle quintile	-0.028	0.113	0.060	0.807	0.973	0.779	1.215
Two wealthiest quintiles	-0.168	0.125	1.815	0.178	0.845	0.662	1.079
Retirement income	-0.479	0.234	4.183	0.041	0.620	0.392	0.980
Household head	0.409	0.369	1.231	0.267	1.505	0.731	3.100
Medical expenditure	-0.074	0.029	6.590	0.010	0.929	0.878	0.983
Average income per household	0.000	0.000	0.342	0.558	1.000	1.000	1.000
Average consumption per household (on food and beverage)	0.000	0.000	0.080	0.778	1.000	1.000	1.000
Physical environment	-0.006	0.089	0.005	0.943	0.994	0.835	1.182
Single†							
Separated or divorced or widowed	-0.229	0.138	2.739	0.098	0.796	0.607	1.043
Married	-0.087	0.099	0.780	0.377	0.917	0.755	1.112
Health insurance	-3.125	0.141	492.556	0.000	0.044	0.033	0.058
Primary or below†							
Secondary	-0.544	0.102	28.403	0.000	0.580	0.475	0.709
Tertiary or professional	-0.049	0.254	0.037	0.847	0.952	0.579	1.566
House tenure - squat†							
House tenure - rent	-2.669	1.080	6.106	0.013	0.069	0.008	0.576
House tenure - owned	-0.469	0.691	0.460	0.498	0.626	0.162	2.424
Social support	-0.090	0.081	1.220	0.269	0.914	0.780	1.072
Living arrangement	0.217	0.154	1.967	0.161	1.242	0.918	1.681
Gender	0.471	0.089	27.804	0.000	1.602	1.345	1.909
Crowding	-0.098	0.048	4.249	0.039	0.906	0.825	0.995
Crime index	-0.009	0.005	2.775	0.096	0.991	0.980	1.002
Assets ownership - property	-0.091	0.091	1.010	0.315	0.913	0.764	1.091
Negative affective	-0.052	0.014	14.608	0.000	0.949	0.924	0.975
Positive affective	0.061	0.018	12.208	0.000	1.063	1.027	1.100
Number of males in household	0.152	0.047	10.440	0.001	1.164	1.062	1.277
Number of females in household	0.118	0.047	6.255	0.012	1.125	1.026	1.234
Number of children in household less than 14 years	0.132	0.038	11.850	0.001	1.141	1.058	1.230
Financial support	-0.140	0.137	1.048	0.306	0.869	0.664	1.137
Age	-0.044	0.003	222.211	0.000	0.957	0.951	0.962
Constant	4.511	0.839	28.909	0.000	91.055	–	–

χ^2 (28) =1595.030, $p < 0.001$; $n = 5683$. -2 Log likelihood = 4181.232.
Hosmer and Lemeshow goodness of fit $\chi^2 = 14.46$, $p = 0.71$; Nagelkerke $R^2 = 0.384$.
Overall correct classification = 85.1% ($n = 4838$). Correct classification of cases of good or beyond health status = 97.2% ($n = 4387$); correct classification of cases of no dysfunctions = 38.6% ($n = 451$).
†Reference group.

For the psychological conditions of rural residents, an OR of 1.063 implies that the estimated odds of self-reported good health improve by approximately 6.3% for each additional positive affective psychological condition. On the contrary, the OR is 0.949 for negative affective psychological conditions and means that the estimated odds of self-reported good health of rural residents in Jamaica will reduce by approximately 95% for each additional negative psychological condition experienced by an individual (Table 2).

Discussion

A key finding of this study is the fact that approximately 83% of rural residents reported good health, and that 12 factors accounted for 38% of the variability in good health. Of the 12 factors, ownership of health insurance was the most significant and this is negatively associated with good health status. The other predictive factors based on the Wald statistic are: age, secondary level education, gender of respondents, psychological conditions (including negative and positive affective psychological conditions), number of children in the household, number of males in household, number of females in household, medical expenditure, house tenure, and retirement income. It is well established in the literature that income, consumption, physical environment, marital status, per capita income quintile, social support, living arrangements, crime, assets ownership, and financial support influence health status[22]. However, in this study, those variables did not significantly determine health status.

Difference in health insurance status between rural and urban residents takes on additional importance because rural populations tend to be older, poorer, and have lower levels of education, all of which can contribute to a lower health status and a higher need for health care[23]. The uninsured are predominantly low-income, working Jamaicans and their families, and most have no insurance because they do not obtain coverage from their workplace, either because it is not offered or it is not affordable[24]. In this study only 5.9% of respondents reported having private health insurance. This is slightly lower than the 7.6% reported in a previous study[6]. Furthermore, the purchase of private health coverage among rural residents is based primarily on the premise that an individual is likely to be ill. This suggests that those who are more vulnerable would be more likely to purchase an insurance policy. This is consistent with the findings of this study, which gives a clearer understanding of the role of health insurance coverage in determining health status, finding that an owner of private health insurance is 0.044 times less likely to have good health. Health insurance coverage is one aspect of reducing the cost of health care, and there is an inverse association between the cost of medical care and good health status. Thus, this study found that those who spend more on medical care are 0.929 times less likely to indicate good health. The low health insurance coverage of rural residents suggests that they are involved in curative intervention, not preventative care, because the cost of the medical care variable consisted of spending on prescriptions, hospitalizations and doctors' fees.

Health generally declines with age. For example, it is well established that ageing means a decline in bone density and a lower vital capacity of the lungs. Longer healing times, deterioration of cartilage, and the calcification of ligaments also shows an association between ageing and health status[25]. There are investigators who have reported that chronological age is not the most important determinant of health, and that ageing does not inevitably bring illness and disease. Health is influenced by numerous other factors, particularly lifestyle, the amount of exercise and nutrition. Although the risk of disease may increase with age, there are many ways that individuals can minimize these risks[26]. A number of studies have found a negative association between good health status and age[14-15,27-30], and this study concurs. Data from Canada have shown that in 2005 a higher percentage of those 55 years or over reported fair or poor health compared with younger age groups. A higher proportion of Canadians 12–24 years old reported excellent or very good health (68%), compared with those 25–54 years old (65%) and those over 55 years (45%). The proportion of

Canadians who rated their health as being fair or poor increased with age, from 5% for those 12–24 years old, to 22% for those 55 years and over[31].

Higher levels of education and a sense of coherence will contribute to one's ability to achieve and maintain a healthy lifestyle, and to access and/or to navigate the healthcare system. Rural minority populations are handicapped by poverty and a lack of education. Higher levels of education and a sense of coherence will contribute to one's ability to achieve and maintain a healthy lifestyle, and to access and/or to navigate the healthcare system. A number of studies[14-15,27-29] have found that individuals with tertiary-level education had the highest health status[32]. However, in this study most respondents attained a secondary education level and there was a negative association between secondary education and good health. This means that respondents in rural areas in Jamaica with a primary education level reported better health status than those with secondary or tertiary education. A rural resident in Jamaica with secondary-level education is 0.580 times less likely to report good health, while those with tertiary level education are 0.952 more likely to report good health. Health educationalists have found that people's health-behaviour does not change simply because they had attained the highest level of education.

According to Ross and colleagues[33], education develops particular skills and the knowledge base of individuals, which is the catalyst for inquiry, reasoning and lifestyle changes. It is this empowerment that shapes the health and wellbeing of the educated populace. These researchers also found that it is not only education that improves healthy lifestyle, but also the number of years of schooling[33]. Ross and colleagues[33] refined this understanding when they proposed that years of schooling influences health through choices, knowledge and the capacity of the recipients. Using data from a 1995 US household survey on aging, status and the sense of control (2593 respondents with an age range of 18 to 95 years), they found that years of schooling expands human-capital skills, abilities and resources. There was also a marginal association between level of education and mortality[34]. A key study by Koo and colleagues[35] reported on a survey by questionnaire of a sample of 2529 adults (956 males and 1573 females aged 43 to 102 years) residing in Seoul and Chunchum. Using multivariate regression they concluded that level of education was a predictor of increased subjective wellbeing.

Culture and society play significant roles in rural women's health status and access to services. Sociocultural norms shape beliefs and attitudes, and condition human behaviours in ways that can be damaging to health and wellbeing. Access to appropriate health care can be problematic among rural women, who experience higher rates of chronic disease and higher acuity of illness than their urban counterparts[36]. Rural women also have fewer visits to physicians and higher rates of hospitalization when they do seek medical care. Rural women may have different expectations about access to health care, as well as differing conceptions of health and personal responsibility toward health behaviors when compared with urban or suburban women. The current model has identified that rural males are 1.6 times more likely to report good health than rural females. If sampling error is taken into consideration for the gender of residents, using the CI 1.345–1.909, the estimated odds will increase by at least 35% for rural males than rural females. This is a paradox because the literature suggests that females seek more health care than males. However, this finding concerns self-reported health conditions and not actual health status. It reflects a disparity in willingness to report on health status between men and women, with women more willing to self-report.

Human emotions are the affected by both positive conditions and negative factors[37]. Depression, anxiety, neuroticism and pessimism are seen as a measure of negative psychological conditions that affect subjective wellbeing[38-39]. Negative psychological conditions affect subjective wellbeing in a negative manner (ie guilt, fear, anger, disgust)[38-39]; and positive factors influence self-reported wellbeing in a direct way[40-42]. Rural residents are more likely than their urban counterparts to experience circumstances, conditions and behaviours that challenge health. People in rural areas are more likely to have characteristics that are strongly

associated with depression, including poor health status, chronic diseases and poverty. Probost and colleagues[43] found the prevalence of depression, as measured by the CID-SF, to be slightly higher in rural than in urban residents. Hambleton and colleagues[30] found that an individual's psychological state influences his/her health status. The findings of this study showed that the psychological state of an individual is critical to their health status (the fifth most influential factor of 12). Unlike Hambleton and colleagues[30], who identified a broad variable called depression (ie a psychological condition), this study refined that psychological construct. The psychological state was deconstructed into positive and negative affective psychological conditions. This study found that negative psychological conditions are inversely related to good health status, while positive affective psychological conditions are directly related to good health status. This suggests that an individual who has experienced more negative affective conditions (loss of loved ones, friends etc) is 0.95 times less likely to report good health status; while an individual who has experienced more positive affective conditions is 1.1 times more likely to report good health status.

Poverty is greater in rural than urban Jamaica, with the PIOJ and STATIN finding 20% more poverty in rural areas, and that in 2002 48% of rural dwellers were living in poverty, with 24% living below the poverty line[44]. According to Case[45], the low level of income common in rural areas significantly reduced citizens' ability to purchase particular food items. The literature shows a strong statistical association of income with health status[14,15,46]. However some studies have suggested this was inconclusive and highlighted other relationships[8,33,47], or suggested that the correlation was weak[30,45,48]. Some of these studies[30,49] have shown that income was weakly related to health status, but in the present study income was not strongly related to good health status. Health is not simply a function of income as one factor, but is due to a set of factors purchased by money [27-28,50], such as education, material possessions or durable goods and technology. It has been suggested that possession of durable goods, rather than just income, be used as an indicator of wealth and income, and this has proved to be significantly associated with health[33].

Some limitations must be considered when interpreting the results of this study. The results were based on the self-reported data of interviewed residents. Survey participants do not always answer factually and may be subject to recall bias regarding their health status. However, interviewers and supervisory staff were aware of this, and interviewer instructions included directions for probing participants on this issue. The strength of the study's sample design and data collection procedures may compensate for these limitations.

Conclusions

In summary, a key finding of this study is that approximately 83% of rural residents reported good health, and that 12 factors accounted for 38% of the variability in good health. Of the factors, ownership of health insurance was the most significant and this was negatively associated with good health status. The other factors that are predictors of health status of rural residents included: age, secondary level education, gender of respondents and negative and positive affective psychological conditions. Within the context of high poverty and the role of health-seeking behaviours in rural residents' health status, an inter-sectoral approach is recommended in order to accomplish better quality of life through improved health status. One of the essential conditions of any health policy and health education program is an understanding of existing health problems in the target group. It follows, therefore, that in order to improve the standard of living in the Caribbean region, in particular in Jamaica, it is critical to know what determines the health status of rural residents. This can be used to guide the improvements needed to enhance rural living standards.

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