Medical Sociology: Modelling Well-being for Elderly People in Jamaica

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ABSTRACT

Objective: *Advances in nutrition, sanitation, water supply, technology and drugs have managed to add years to life. However, with the continuing increase in the non-communicable diseases, the World Health Organization (WHO) has said that disabilities have eroded nine years from the healthy quality of life of Jamaicans. The current study aims to provide factors that will explain how to attain 'good' health.*

Method: *The research design for this study is an explanatory one. This research utilizes cross-sectional data taken from the Jamaica Survey of Living Conditions (JSLC) 2002 in order to identify and explain some of the determinants of well-being among the Jamaican elderly. Information collected used self-administered questionnaire. Multivariate regression was used to establish the well-being model. The surveyed population was 3009 respondents ages 60 years and older, with 52.7% females (n = 1423) and 47.3% males (n = 1423). The average age of the surveyed population was 71 years 10 months ± 8 years six months.*

Result: *Of the 14 predisposed variables that were used to test the general hypothesis, 11 were found to be statistically significant. From the selected variables of this study, the six most important factors that impact on the well-being of the Jamaican elderly in descending order are as follows: social support (β = 0.486), average occupancy per room (β = -0.428), area of residence – living in Kingston Metropolitan Area (KMA) with reference to rural areas (β = 0.179) or dwelling in other towns with reference to rural area (β = 0.157), education (β = 0.155) followed by the physical environment (β = -0.138) and age of respondents (β = -0.129).*

Conclusion: *The predisposed variables used in this study explain 45.9% of the variance in quality of life. The variable that has the most influential impact on well-being is social support. The general well-being of the Jamaican elderly is low (mean of 3.9/14 ± 2.3). The model provides a basis upon which we can address patient care and 'good' health.*

Sociología Médica: Modelando el Bienestar de las Personas de la Tercera edad en Jamaica

PA Bourne

RESUMEN

Objetivo: *Los avances en materia de nutrición, servicios sanitarios, suministro de agua, tecnología y medicamentos, han contribuido a alargar los años de vida. Sin embargo, con el aumento de enfermedades no comunicables, la Organización Mundial de la Salud (OMS) ha señalado que las discapacidades han reducido en nueve años la calidad de la salud de los jamaicanos. El presente estudio apunta a suministrar los factores que explican como lograr "buena" salud.*

Método: *El diseño de investigación de este estudio es explicativo. Esta investigación utiliza datos de corte transversal, tomados de La Encuesta de Jamaica 2002 sobre las Condiciones de Vida (JSLC), a fin de identificar y explicar algunas de las determinantes del bienestar entre los ancianos jamaicanos. La información fue recogida usando cuestionarios auto-aplicados. Para establecer el modelo de bienestar se usó la regresión multivariada. La población investigada fue de 3009 encuestados de 60 años de edad o más, siendo el 52.7% mujeres y el 47.3% hombres (n =1423). La edad promedio de los encuestados fue de 71 años, 10 meses ± 8 años, seis meses.*

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Resultado: *De las 14 variables predispuestas usadas para probar la hipótesis general, se halló que 11 fueron estadísticamente significativas. De las variables seleccionadas para este estudio, los seis factores más importantes que afectan el bienestar de las* personas de la tercera edad en Jamaica – en orden descendente – son: el apoyo social (β = 0.486), el promedio de ocupación por *cuarto (β = -0.428), el área de residencia – vivir en el Área Metropolitana de Kingston (KMA) con referencia a las áreas rurales (β = 0.179) o vivir en otros pueblos con referencia al área rural (β = 0.157), educación (β = 0.155) seguida del ambiente físico (β = -0.138) y la edad de los encuestados (β = 0.129).*

Conclusión: *Las variables predispuestas usadas en este estudio, explican el 45.9% de la varianza en la calidad de vida. La variable con mayor impacto e influencia en el bienestar es el apoyo social. El bienestar general de los ancianos jamaicanos es bajo (media de 3.9/14 ± 2.3). El modelo proporciona una base a partir de la cual podemos abordar el cuidado del paciente y una "buena" salud.*

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INTRODUCTION

A large part of healthcare in Jamaica has been predominantly guided by the biomedical model. Dating back as far as 130 CE to 200 CE, health was conceptualized and treated from the perspective of dysfunctions, diseases or functional limitation. A group of scholars ascribed this to Western medicine (1). The simple conceptualization of health from the vantage point of the 'mechanistic result to the exposure to a specific pathogen' (2) is called the biomedical model. Globally, this model was dominant leading up to the 1950s. However, in 1946, the World Health Organization (WHO) expanded on this operational definition of health. According to the WHO (3), health is not merely the absence of diseases or infirmity but it is a state of complete physical, social and psychological well-being. Even though this definition is extensive and one scholar believes that it is illusive (4), Engel in the 1950s coined what is called the biopsychosocial model. Engel recognized that patient care cannot be left simply to diseases or infirmity (5–9), proposed that for the treatment of psychiatric patients, we should incorporate the mind, body and social conditions. He believed that social, physiological and psychological conditions are all affecting an individual's health and so by treating the patient only for the outcome is not holistically addressing the principal symptoms, which he classified as a biopsychosocial model.

Despite the conditions of Engel and the WHO to the space of health conceptualization, there is still that predominance of the biomedical model. There is a debate that the biospychosocial model is not merely a model but that it is rather a conceptual framework. The rationale forwarded is that Engel did it to provide a mathematical approach to his work that outlines how the factors influence well-being (or health). This paper recognizes this discourse but will not proceed therein as the author is concerned about where these are today. In 1972, an economist, Grossman (10) built a model which was used to examine the health state of people in the world. Grossman's model incorporates biological and social factors as having an influence on well-being. One of the limitations to the Grossman's model and it's expansion by Smith and Kington (11) is that it uses physical functioning as the operational definition of health. Despite this limitation, the research will use the expanded version of the Grossman's model by Smith and Kington as the theoretical framework that will underpin this study.

Why is there a need for a study on medical sociology of elderly Jamaicans? The answer is simple, the 'advancement of patient care'. A recently published case report by Ali *et al* (12) on an elderly man highlights the complexities of the elderly, and the gap that exists in traditional medicine using the biomedical model in their care.

The authors noted two important issues in their report, (i) multiple medical problems of the elderly and (ii) dysfunctions. This again is a clear case of the use of Western medicine in the pursuit of treatment of a condition in a particular age cohort which is highly susceptible to various dysfunctions. The patient had to be treated from the vantage point of what led to this particular situation. This limitation brings into focus, the need to coalesce medicine, sociology, psychological and the environmental conditions in the treatment of illnesses. Humans are complex multidimensional *homosapiens* particularly the elderly, and so in order to address their health, we must include all the conditions that are likely to influence their health conditions.

Looking at the life expectancy at birth for males and females in Jamaica (Table 1), some people may believe that

Table 1: Life expectancy at birth of Jamaicans by gender: 1880–2004

Period	Average expected years of life at birth	
	Male	Female
1880–1882	37.02	39.80
1890–1892	36.74	38.30
1910–1912	39.04	41.41
1920–1922	35.89	38.20
1945–1947	51.25	54.58
1950–1952	55.73	58.89
1959–1961	62.65	66.63
1969–1970	66.70	70.20
1979–1981	69.03	72.37
1989–1991	69.97	72.64
1999–2001	70.94	75.58
2002–2004	71.26	77.07

Sources: Demographic statistics (13)

the advances in nutrition, sanitation and medical knowledge are such that there is no need to examine quality of life. Because life expectancies are comparable to some developed societies, some argue that one should be satisfied with the achievements thus far and leave things as they are. The fact is Jamaicans are living longer but they are equally exposed to more biopsychosocial and environmental conditions that will erode some of the gains in life expectancy. The Statistical Institute of Jamaica and the Planning Institute of Jamaica have both published works that show that non-communicable diseases are on the rise along with longevity. These non-communicable diseases are more likely to affect elderly people than the younger cohorts [Demographic Statistics 2006; Economic and Social Survey Jamaica 2006] (13, 14). Elderly Jamaicans are indeed a vulnerable group that must be studied by researchers. The seniors cannot be neglected as they will constitute an increasingly larger percentage of total population and sub-populations in different topography than in previous centuries (15–21). In 1950, aged people (60^+ years) constituted 5.8%; in 2007 the figure was estimated to be 10.3%, and in 2025 it will be 15.5% and by 2050 it will reach 23.6% (Table 2). Population ageing in Jamaica began as early as the 1960s, but the rate of growth of the elderly population has been growing more than the other age cohorts (Table 3). Eldemire (16) noted that "*the majority of Jamaican older persons are physically and mentally well and living in family units*" but will it be the same 10 years later and beyond 2008.

Table 2**:** Jamaica: Selected demographic variables, labour force participation (in %).

Total (% of population[4])	1950	1975	2007	2025	2050
60+	5.8	8.5	10.3	15.0	23.6
65+	3.9	5.8	7.6	10.3	17.7
80+	0.2	0.8	2.0	2.3	5.6
Female	**1950**	**1975**	**2007**	**2025**	**2050**
60+	6.6	9.0	10.7	16.1	25.9
65+	4.4	6.3	8.1	11.0	19.9
80+	0.3	1.0	2.2	2.6	6.9
Male	**1950**	**1975**	**2007**	**2025**	**2050**
60+	5.0	8.0	9.9	13.8	21.3
65+	3.2	5.3	7.1	9.7	15.4
80+	0.2	0.6	1.8	2.0	4.3
	1950	**1975**	**2007**	**2025**	**2050**
Median age	22.2	17.0	24.9	30.7	39.3
Labour force participation	**1980**	**1990**	**2007**	**2010**	**2020**
60+	46.4	37.1	26.6	26.6	25.1
65+	30.4	23.6	13.8	13.1	12.3
80+	65.3	53.6	41.4	40.7	39.6

United Nations (43)

Table 3: Growth rate of selected age group and for total population of Jamaica, using Census data: 1844–2050

Year	0–14	15–64	65+	Total
1844–1861	*	*	*	0.87
1861–1871	*	*	*	1.25
1871–1881	*	*	*	1.25
1881–1891	0.94	1.07	-0.4	0.86
1891–1911	1.39	1.19	0.90	1.25
1911–1921	0.18	0.33	0.85	0.29
1921–1943	1.27	1.77	2.08	1.59
1943–1950[1]	1.39	1.76	0.55	1.57
1950–1960[2]	2.25	1.06	1.74	1.55
1943–1960	2.12	1.00	1.65	1.46
1960–1970	2.07	0.03	3.36	1.08
1982–1991	-0.32	1.04	1.18	0.55
1991–2001	0.33	1.46	1.43	1.08
2001–2006	-1.61	1.33	1.10	0.42
2005–2010	*	*	1.0**	0.4**
2025–2030	*	*	3.3**	0.0**
2045–2050	*	*	2.0**	-0.6**

Source: Computed by Author from Statistical Yearbooks and Demographic Statistics
* Missing data
** Taken from the *World Population Ageing 2007:309*

[1] The figures for 1943 were taken from the STATIN (13) and the values for 1950 were taken from the United Nations (43)

[2] The figures for 1960 were taken from the STATIN (13) and the values for 1950 were taken from the United Nations (43)

Healthy Life Expectancy

One of the drawbacks to the use of life expectancy is its absence to capture 'healthy' years of life. Traditionally, when life expectancy was measured, it used mortality data to predetermine the number of years of life yet to be lived by an individual, assuming that he/she subscribes to the same mortality patterns of the group. The emphasis of this approach is on length of life and not on the quality of those years lived. Associated with ageing is the high probability of increased dysfunctions and the unavoidable degeneration of the body. This explains why it is germane to analyse healthy life expectancy and not merely life expectancy. Healthy life expectancy is defined as the number of years that an individual is expected to live in 'good' health.

In evaluating health or well-being, we must seek to examine more than just the number of years that an individual is likely to survive as we should be concerned about the quality of these years. Even though, life expectancy is an indicator of health, the new focus is on healthy life expectancy. Based on the Healthy People 2010, the new thrust is on increasing quality of healthy years of life. In attempting to capture 'quality of years lived', in 1999, the WHO introduced an approach that allows us to evaluate this, the 'disability adjusted life expectancy' (DALE). DALE does not only use length of years to indicate health and well-being

status of an individual or a nation but incorporates the number of years lived without disabilities (22).

Disability Adjusted Life Expectancy is a modification of the traditional 'life expectancy' approach in assessing health. It uses the number of years lived as its principal component. This is referred to as 'full health'. In addition, the number of years of ill-health is weighted based on severity as another component in the equation. This is then subtracted from the expected overall life expectancy to give what is referred to as years of healthy life. Embedded in this approach is the adjustment of years lived in 'ill-health'.

Having arrived at 'healthy life expectancy', the WHO has found that poorer countries lost more from their 'traditional life expectancy' than developed nations. The reasons forwarded by the WHO are the plethora of dysfunctions and the devastating effects of some tropical diseases like malaria that tend to strike children and young adults. The institution found that these account for a 14 per cent reduction in life expectancy from poorer countries and nine per cent from more developed nations [WHO 2000] (23). This system is in keeping with a more holistic approach to the measure of health and well-being with which this study seeks to identify. By using the biopsychosocial model in the evaluation of well-being of aged Jamaicans, we will begin to understand factors that are likely to influence the quality of lived years of the elderly, and not be satisfied with the increased length of life of the populace. Looking at the life expectancy data for Jamaica, the figure is 74.1 years for both genders (13) but using healthy life expectancy, it is 65.1 years (22). This means that life expectancy has been increasing at a faster rate than 'healthy life expectancy'. Therefore, Jamaicans are expected to spend some nine years of their life in 'poor health'.

The work of Hambleton *et al* (24) is an indicator of the use of the biopsychosocial model in the study of the elderly Barbadians. They used physical functioning like Grossman (10), and Smith and Kington to operational health, which to some extent is a regression to the past. Thus, this study is both an expansion of the Smith and Kington's work (11) and it is hoped that it will aid medical practitioners and policy makers in Jamaica to be aware of the factors that impact on well-being of the elderly.

Theoretical Framework

The overarching theoretical framework that will be adopted in this study is an econometric model that was developed by Grossman (10) and that was expanded upon by Smith and Kington (11) which read:

$$H_t = f\ (H_{t-1}, G_o, B_t, MC_t, ED) \ldots\ldots\ldots\ldots\ldots\ (1)$$

In which the H_t current health in time period t, stock of health (H_{t-1}) in previous period, B_t – smoking and excessive drinking, and good personal health behaviours (including exercise – G_o), MC_t, – use of medical care, education of each family member (ED), and all sources of household income [including current income] (11). Grossman's model was further expanded upon by Smith and Kington to include socio-economic variables (Equation 3).

$$H_t = H^*\ (H_{t-1}, P_{mc}, P_o, ED, E_t, R_t, A_t, G_o) \ldots\ldots\ldots\ [2]$$

Equation 2 expresses current health status H_t as a function of stock of health (H_{t-1}), price of medical care P_{mc}, the price of other inputs P_o, education of each family member (ED), all sources of household income (E_t), family background or genetic endowments (G_o), retirement related income (R_t) and asset income (A_t,)

This study will use instead more variables than the Smith and Kington's model. In addition to the number of selected variables for this research, the researcher will expand on the operational definition of well-being. Well-being will be physical functioning as well as economic well-being. This paper will broaden construct of health that will incorporate biological, psychological and sociological conditions in assessing the health status of elderly Jamaicans to:

$$W_i = f\ (P_{mc}, ED, A_i, E_n, G, MS, AR, P, O, H, T, V, SS, H_{Ai}, \varepsilon_i) \ldots\ldots\ldots\ [3]$$

Where W_i is well-being of the Jamaican elderly, *i* is a function of cost of medical (health) care (P_{mc}), the educational level of the individual (ED), age of individual *i* (A_i) environment (E_n), gender of the respondents (G), marital status (MS), area of residents (AR), positive affective conditions (P), negative affective conditions (N), average occupancy per room (O), home tenure (H) and property ownership (T), social support (SS), accessing health services or healers (H_{Ai}) by individual *i*, and crime and victimization, (V). The researcher also included the standard error of the model, ε_i.

METHOD AND DATA

The research design for this study is an explanatory one. This study utilizes cross-sectional data taken from the Jamaica Survey of Living Conditions (JSLC) 2002 in order to identify and explain the determinants of well-being among the Jamaican elderly. The use of multivariate analysis to generate a model for the phenomenon clearly indicates a mathematical demographic approach. The surveyed population was 3009 respondents ages 60 years and older with 52.7% females (n = 1423) and 47.3% males (n =1423).

Operationalized definitions

Well-being Index = $\frac{1}{2}\ [MR] - \frac{1}{2}[\Sigma H_i]$ where higher values denote more subjective well-being. The index ranges from a low of -1 to a high of 14. Scores from 0 to 3 denote very low, 4 to 6 indicates low; 7 to 10 is moderate and 11 to 14 means high well-being.

Financial support, $FS = \Sigma$ (NIS, Private pension, Government pension, other pensions), ranging from 0 to 2, where 0 represents not receiving any form of pension payment and higher scores indicate receiving more.

Material resources, $MR = DG, FS, Y_i$

Where the index ranges from 0 to 25, a low score indicates low economic well-being and higher scores greater economic well-being

Note: The index ranges from a low of -1 to a high of 14. A score from -1 to 3 denotes very low, 4 to 6 indicates low; 7 to 10 is moderate and 11 to 14 means high well-being.

Home tenure:

Dwelling 1 1 = rent, 0 = otherwise
Dwelling 2 1 = owned, 0 = otherwise
Reference group is squatting, rent free

Education

Edu_level 1 1 = Secondary and vocational, 0 = otherwise
Edu_level 2 1 = tertiary, 0 = otherwise
The referent group is primary and below education

Crime Index = $\Sigma k_i T_j$, *where* K_i

The equation represents the frequency with which an individual witnessed or experience a crime, where *i* denotes 0, 1 and 2, in which 0 indicates not witnessing or experiencing a crime, 1 means witnessing 1 to 2 crimes, and 2 symbolizes seeing 3 or more crimes.

T_i denotes the degree of the different typologies of crime witnessed or experienced by an individual (where j = 1 …4, which 1 = valuables stolen, 2 = attacked with or without a weapon, 3 = threatened with a gun and 4 = sexually assaulted or raped. The summation of the frequency of crime by the degree of the incident ranges from 0 and a maximum of 51.

Area of residence:

Area_Residence2 1 = other towns, 0 = otherwise
Area_Residence3 1 = KMA, 0 = otherwise

Results: Demographic Characteristics

The sample population consisted of 3009 elderly Jamaicans (ages 60 years and older). The mean age of the sample is 71 years 10 months ± 8 years 6 months (range = 39 years, with the maximum age being 99 years) [Table 1.2]. Males constituted 47.3% of the sample (n = 1 423) compared to 52.7% of females (n = 1 586). Disaggregating the data revealed that 64.5% of the sampled population were young old (n = 1940), 26.4% was old-old (n = 793) and 9.2% were in the oldest-old age cohort (n=276) [Table 1.2]. With regard to the gender composition of the surveyed population, the gender distribution was relatively even. However, there was a substantial disparity in the oldest-old age group where approximately two-thirds (65%) of that cohort were females (Table 1.2). Overall, on an average, the well-being of the elderly Jamaicans is low, 3.8 out of 14, with a mode of 3.5. The well-being index ranges from a low of -1 to a high of 14 (Table 1.1). Scores from -1 to 3 denote very low, 4 to 6 indicate low, 7 to 10, moderate and 11 to 14 mean high well-being.

For this section of the paper, using a nationally representative sample of Jamaicans (secondary data), the researcher tested the hypothesis that

$W_i = f\ (P_{mc}, ED, Ai, E_n, G, MS, AR, P, O, H, T, V, SS, H_{Ai}, \varepsilon_i)$

Table 1.2: Profile of the surveyed respondents: variables used in well-being model

	% (n)
Area of residence	
Rural areas	66.8 (2010)
Other towns	21.1 (634)
Kingston metropolitan area	12.1 (365)
Social support	
No	44.0 (1325)
Yes	56.0 (1325)
Accessing health services	
No	85.3 (2505)
Yes	14.7 (433)
Gender	
Males	47.3 (1423)
Females	52.7 (1586)
Home tenure (dwelling)	
Own	85.9 (2580)
Rent	4.9 (147)
Other (include squat, rent-free, and other)	9.3 (278)
Marital Status	
Married	40.4 (1192)
Never married	29.3 (864)
Divorced	1.8 (54)
Separated	2.1 (63)
Widowed	26.4 (778)
Environment	
Affected by landslide etc.	38.4 (1848)
Not affected by	61.6 (1848)
Level of education	
Primary/prep. and below	63.2 (1793)
Secondary/high	33.4 (949)
Post-secondary (*ie* tertiary)	3.4 (97)
Age	mean age is 71 yrs.10 months ± 8 yrs. 6 mths (SD), range 39 yrs
Crime Index	means is 1.2 (± 5.88), median = 0
Cost of healthcare	mean is $1 636.24 (± $3 224.99), median is $650.00 max = $40 500
General well-being	mean 3.9 ± 2.3; mode 3.5
Positive affective conditions	mean 2.9 ± 2.5; range 8; max 6, mode = 4
Negative affective conditions	mean 3.8 ± 3.2; range 17, max 17, mode = 0
Average occupancy per room	mean 1 ± 1; mode = 1, range 11, max 11

From the data (Appendix I), a linear function resulted which excluded all those variables that were not statistically significant:

$$W_i = \alpha_0 + \alpha_1 (lnP_{mci}) + \alpha_2 ED_i + \Sigma\alpha_3 P_i + \Sigma\alpha_4 MS + \alpha_5 T + \alpha_6 E_n + \alpha_7 A_i + \alpha_8 (ln\ O_i) + \alpha_9 C + \alpha_{10} G + \Sigma\alpha_{11} SS + \varepsilon_i$$

All the other abbreviations were previously defined except α_0 which is a constant, and α_{1-12}, where 1 to 12 are the regression coefficients for each of the factors; $\Sigma\alpha_{4j}P_{ij}$ means the summation of the positive and the negative affective conditions of individuals i and j represent each psychological conditions (ie negative and positive), α_{4j} indicating the fourth factor and $\Sigma\alpha_{12}SS$ is the summation of social support which includes being a member of social organizations, number of males and number of females.

DISCUSSION

The model has a Pearson's correlation coefficient of 0.691 (or 69.1%, $\rho < 0.001$) which means that the association between well-being and the selected factors used in the model was moderately strong. The adjusted coefficient of determination, adjusted r^2 (Table 4.1.10) is 0.459 (or 45.9%). This denotes that a one per cent change in physical environment, psychological conditions, cost of healthcare, area of residence, age of respondents, average room occupancy, marital status, property taxes, social support, gender, crime and educational level change well-being by 45.9 per cent. Here 46 per cent of the total variation in the well-being of elderly Jamaicans can be explained by the selected variables used in this model. Based on the Model ***Test Ho: β = 0***, with ρ value = 0.05, the researcher concludes that the linear model provides a best fit to the data – F value [16 608] is 26.416, $\rho < 0.001$.

Of the 14 predisposed variables that were used to test the general hypothesis, 11 were found to be statistically significant. These are as follows – (i) marital status – if individual is divorced, separated or widowed compared to single; (ii) physical environment, (iii) area of residence; (iv) average occupancy per room, (v) property ownership; (vi) cost of medical (or health) care, (vii) psychological conditions, which include – (a) positive and (b) negative affective conditions; (viii) social support, (ix) educational attainment – if the individual has tertiary education with reference to primary level (x) age of respondents and (xi) gender of respondents. Thus, those that were not found to be factors are as follows – crime and victimization, home tenure, if educational level of the individual is secondary with reference to primary and below and accessing healthcare services.

From the selected variables of this study, the six most important factors that impact on the well-being of the Jamaican elderly in descending order are as follows: social support (β = 0.486), average occupancy per room (β = -0.428), area of residence – (living in KMA with reference to rural areas β = 0.179 or dwelling in other towns with re-

Table 4**:** Well-being equation of the Jamaican elderly

Model **Dependent variable: Well-being of the Jamaican elderly**			
Independent variables	**Unstandardized coefficient B**	**Standard error**	**Standardardized coefficient β**
Constant	2.008	1.087	
Physical environment	-0.584*	0.132	-0.141
Positive affective conditions	0.052*	0.025	0.067
Negative affective conditions	-0.112*	0.021	-0.175
In cost of medical (health) care	0.201*	0.053	0.123
Age of elderly	-0.032*	0.008	-0.129
Area – residence 2	0.949*	0.162	0.180
Area – residence 3	1.322*	0.262	0.157
In average occupancy per room	-1.192*	0.137	-0.412
Marstatus 1	0.357*	0.176	0.088
Marstatus 2	0.229		NS**
No of adult males	0.262*	0.072	0.125
No of adult females	0.561*	0.077	0.288
Property ownership	0.554*	0.145	0.117
Social support	0.313*	0.122	0.078
Healthser	0.019		NS**
Crime	0.007		NS**
Gender	0.320*	0.135	0.079
Dwelling 1	0.000		NS**
Dwelling 2	0.153		NS**
Edu_level 2	0.030		NS**
Edu_level 3	2.178*	0.429	0.156

n = 629 R = 0.691 Adjusted R^2 = 0.459 Error term = 1.56
F statistics [21, 618] = 26.42 ANOVA = 0.001
* significant ρ value < 0.05
**NS denotes not statistically significant

Gender is a dummy variable, 1 = males and 0 = female
Social support is a dummy variable, 1 = living with other household members, 0 = other
Seeking healthcare services (*ie* Healthser) is a dummy variable, 1 = yes, 0 = no
Property ownership is a dummy variable, 1 = yes, 0 = no

ference to rural area β = 0.157), education (β = 0.155) followed by the physical environment (β = -0.138) and age of respondents (β = 0.129). Thus, the significance of this paper is that we now have a quantitative model that can be used to evaluate the well-being of the elderly Jamaicans. Of the most important factors that contribute to well-being of aged Jamaicans, some were adding to and others eroded from quality of life. The average number of persons per room and the physical environment reduced the quality of life.

Pacione (25) has generalized that the environmental quality plays a significant role in determining the quality of life of people. This he argues result from population density, crowding, poor housing, design of built environment, temperature and pollutant levels which may result in fatigue and reduced ability to cope with these issues that are all influencing well-being. Because the human body relies on the environment for such things as oxygen and survival, airborne pollutants will affect the quality of life of aged people as people's biological process is influenced by the environment (15). Airborne particles can cause respiratory or cardiovascular illnesses that substantially plague the elderly (26) and is a reason for the deaths in this age cohort (27,28). Another scholar generalized that people between 65 and 74 years, after exposure to air pollutants, had a higher death rate than children less than one year (29). Where the literature has clearly indicated a correlation between the environment, this study concurs with them but must say that it is the least factor in predicting subjective well-being of the Jamaican elderly.

The other factors contributed positively to quality of life. What should be noted here is that social support is the most influential factor on the well-being of the aged, followed by the average number occupying a room rather than the psychological state of the elderly. Disaggregating the psychological state of the elderly revealed that experiencing negative affective conditions has greater impact on the individual's well-being than if the person were experiencing positive affective conditions (Table 1.3).

In the Far East, the data revealed that each additional child that is born increases the likelihood of the elderly receiving financial support without any diminishing returns. The findings showed that increasing gains from having an additional child are more apparent in rural than in urban zones (30). With a strong positive association between number of children and the likelihood of elderly support, a reduction in family size will see changes in support for the aged populace. In McNally and Williams [undated] (31), Martin 1990 (32) forwarded the position that in developing countries, family support plays a significant role and represents the best form of care for the elderly; a point concurred on by Anthony (33) and Stecklov [1999] (34). Anthony commented that the aged are sometimes left alone because of death of the other partner, which may result in depression or even low self-esteem. It is important, then, to comprehend how social isolation impacts on the well-being of the elderly. Steckklov, on the other hand, in his thesis '*Evaluating the economic returns to childbearing in Cote d'lvoire*' sought to prove (or disprove) the claim that children are economic assets to their parents and affirms with other studies that this is so. He found that on an average, the additional child increases the elderly parent's material possessions with time. This fact is a rationale for poor families to increase their family size in an attempt to relieve them of poverty over time. Despite the difficulties of sharing the 'little' that the parents have, they perceive that the opportunity cost of high fertility in the future outweighs the present cost of economic misfortune. This is even more pervasive in poor households, of rural zones, with low educational attainment.

Despite the six most influential factors that determine well-being of aged Jamaicans, there are some that are equally significant but play a lesser role than those conditions that were previously mentioned. The findings show that both the age of the respondents was inversely related to quality of life (β = -0.129). It follows that as the elderly ages he/she will have a lower quality of life. The other conditions are property ownership (β = 0.116), cost of healthcare (β = 0.121), marital status – being separated, divorced or widowed with reference to single (β = 0.086) and gender (β = 0.076). Although money can purchase some amount of health, it's positive influence is seventh from among eleven conditions. Ownership of property that is an income earner for some persons were the eighth influential factor. The well-being of the surveyed males is higher than that of their female counterparts. From the beta value, being male or female contributed the least to quality of life of surveyed respondents.

The findings on the gender disparity of well-being concur with the literature. A survey done by Rudkin found that women have lower levels of well-being (*ie* economic) than men (35). This finding is further sanctioned by Haveman *et al* (36) whose study reveals that retired men's well-being was higher than that of their female counterparts because men usually received more material resources and more retired benefits compared to women 65 years and older. Thus with men receiving more than women, and having more durable possession than women, their material well-being is higher in later life.

A number of studies found that the aged who were less likely to be victimized were more likely to be fearful (37–42). Thus, if the aged are least likely to be affected by crime, the issue of fear will have already been accounted for in their psychological state.

CONCLUSION

The life expectancy statistics on Jamaicans has doubled since the 1900s. However the new thrust is not on life expectancy but on healthy life expectancy of people. In this regard, Jamaicans will lose nine years of life to 'poor health'. With

the increase in non-communicable diseases such as hypertension, cerebrovascular and cardiovascular diseases, and diabetes mellitus, the quality of life (or the health) of the elderly is not as good in the additional years of life gained. Because the emphasis on health has shifted from diseases to 'quality of years lived', a biopsychosocial and environmental model is the way to go in assisting medical practitioners and policymakers in understanding the factors that are responsibility for improvement and reduction in 'good' health or better quality of life for the aged Jamaicans. This study is timely as it provides an analysis of the well-being of the Jamaican elderly. There is a cultural belief that aged persons are among the most vulnerable within all societies, and this is equally so in Jamaica. This assumes that on an average the quality of life of this cohort of people is lower than those of the economically and the physically active population. This study has corroborated with the overall suspicion of Jamaicans that the aged is a vulnerable group (as the average well-being of elderly Jamaicans is 3.9 out of 14 – low well-being having a mode of 3.5).

The research went further than computing a general self-reported index of well-being to build a model which constitutes demographic, psychosocial and ecological variables that can be used to determine the quality of life of elderly Jamaicans.

Of the 12 selected variables that were used to test the general hypothesis, 10 were found to be statistically significant. These excluded gender of respondents. … The five most important impacting factors of well-being of the Jamaican elderly in descending order are as follows: average occupancy per room (β = -0.229), physical environment (β = -0.190), education (β = 0.173), area of residence (β = 0.0.164) and cost of healthcare (β = 0.148). Thus, the significance of this paper is that we now have a quantitative model that can be used to evaluate the well-being of the elderly Jamaicans.

Having identified that well-being of aged people is influenced by a number of conditions, from the explained variation of 45.9%, one may be tempted to argue that the model is useless or of little significance as the unexplained events are still to be investigated and are not found. A number of rationales justify such a finding. But before they are embarked upon, this study must be properly contextualized within a broader framework, as it has external validity. A similar study called SABE conducted in Barbados in 2005 by Hambleton *et al* (24) found that 38.2% of the variation in quality of life of aged Barbadians (60 years or over) is explained by the model of determinants. Those factors include lifestyle behaviours (exercise, conditions relating to smoking or non-smoking), historical conditions (such as, socio-economic experiences early in life), diseases and current socio-economic conditions (*eg* education of the family members, household room density, all sources of income – including pensions and retirements and social networks). Thus, this study is in keeping with what exist in Barbados and so is a platform upon which further investigations should be launched with the inclusion or all other germane factors that were omitted in these two works. This model does not provide all the answers. However, it is a beginning in the examination of the health of a group that is infrequently studied in Jamaica. The reality is that inspite of the longevity of many elderly people, longer life for Jamaicans mean that on an average nine years will be lost to disabilities and 'bad health'(22). This study now provides us with information of those factors that will aid or erode the health (or well-being) of the studied population.

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