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Social determinants of physical exercise in older men in Jamaica

Chloe Morris[1], Paul A. Bourne[1], Denise Eldemire-Shearer[1], Donovan A. McGrowder[2]

[1]Departments of Community Health and Psychiatry, and [2]Pathology
Faculty of Medical Sciences, The University of the West Indies, Mona Campus, Kingston 7, Jamaica.

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Abstract

Background: Background: Physical activity interventions have been demonstrated to improve health-related quality of life and to be of special benefit to older adults with specific chronic conditions including arthritis, hypertension, diabetes mellitus, and heart disease. Aim: This study examined the extent and social determinants of physical exercise in elderly men in Jamaica. **Materials and Methods**: A sample of 2,000 men 55 years of age and older was extracted from a total of 33,674 males in the parish of St. Catherine. A 132-item questionnaire was used to collect the data. A stratified random sampling technique was used to draw the sample. Descriptive statistics were used to provide background information on the sub-sample, and logistic regressions were utilized to model physical exercise. **Results**: Of the respondents, 55.4% indicated good health status, 51.0% lived in rural areas; 10.4% had moderate to high functional dependence and 67.3% reported that they did some form of physical exercise. Of those who indicated involvement in physical exercise (n = 1,345), 77.2% jogged, ran, and/or walked; 13.3% did aerobics; 4.7% swam; 2.0% cycled and 0.6% did push-ups or sit-ups. The variables that predicted being engaged in physical exercise were education; age of respondents; current good health status; household head; health plan; employment status, and social support. **Conclusion**: Most of the elderly men were engaged in some form of physical activity and had good health. Age and good health status were the most influential social determinants of physical exercise. However, effective interventions to promote physical activity in older men in Caribbean countries such as Jamaica deserve wide implementation.

Keywords: Older men, social determinants, physical exercise, St. Catherine, Jamaica

Correspondence to: Paul Andrew Bourne, Research Fellow, Department of Community Health and Psychiatry, Faculty of Medical Sciences, University of the West Indies, Mona Campus, Kingston 7, Jamaica. Email: paulbourne1@yahoo.com.

Introduction

The Caribbean has been identified as the most rapidly ageing region of the developing world. Between 1960 and 1995, there was a 76.8% increase in the elderly population [1]. Among its regional island states, the average growth rate in the elderly population was approximately 5.3% for the period between 1995 and 2000 [1]. Jamaica has a population of approximately 2.6 million and has undergone a significant demographic transition in the last 5 decades [2, 3]. Some features of this transition include the increase in the median age of the population from 17 years to 25 years between 1970 and 2000, the doubling of the proportion of persons older than 60 years to over 10% and the increase in life expectancy at birth from less than 50 years in 1950 to greater than 70 years in 2000 [4]. The main causes of illness and death in Jamaica and many other Caribbean islands and regions at a similar state of development are chronic non-communicable diseases [5].

There is heightened concern within the Caribbean regarding the need to implement comprehensive health promotion programmes aimed at the prevention and control of chronic diseases [6]. Heart disease, hypertension, diabetes mellitus, and cancer are currently the major conditions affecting the health of adults in the

Caribbean, and they impose a significant burden in terms of long-term illness, disability and death [7]. The significance of these conditions is reflected in prevalence rates. Diabetes-related deaths in 1994 had increased 147% over the 1980 level, representing the third leading cause of loss of years of potential life among women, and the tenth among men [8]. The English-speaking Caribbean has the highest mortality from this cause in all the sub-regions of the Americas.

Physical inactivity, a known modifiable risk factor for future disability, also increases with age [9, 10]. Physical activity interventions have demonstrated multiple benefits among older adults, including improved functioning and health-related quality of life [11, 12], and decreased levels of depression [13]. Physical activity has also been shown to benefit older adults with specific chronic conditions, including rheumatoid arthritis, heart disease, and diabetes mellitus [14]. Specifically, studies show that regular physical activity reduces the risk of dying prematurely and of developing diabetes mellitus, hypertension, and colon cancer; it also reduces feelings of depression and anxiety, helps control weight, maintains bone mineral density, and promotes psychological well-being [15, 16].

Despite these documented benefits, estimates suggest that 33% of men and 50% of women over the age of 75 are not engaged in any physical activity [17]. The prevalence of inactivity varies by racial and ethnic group and by gender, from 47% in white women aged 75 and older to 59% in older black men and 61% in older black women [18]. In addition, past estimates suggest that, of older adults who engage in any physical activity, only 25% aged 65 to 74 and 15% aged 75 and older meet the recommendations for vigorous or moderate physical activity [17]. Data on physical activity levels in Jamaica and Trinidad & Tobago indicate that individuals may be experiencing difficulty in initiating and sustaining desired exercise behavior. A national study recently conducted in Jamaica revealed that only 21.6% of the sample participated in planned exercise [19]. In Trinidad, participation rates were even lower, with 16.6% of men and 5.9% of women reporting that they were taking regular exercise [20].

Increasing attention is being placed on preventing and delaying the onset of chronic diseases among the elderly in order to extend the duration of functional well-being and healthy life expectancy. In addition to new evidence regarding the importance of exercise and physical activity for healthy older adults, there is now a growing body of knowledge supporting the prescription of exercise and physical activity for older adults with chronic diseases and disabilities. Until a relatively short time ago, published evidence on the health of the elderly in developing nations was lacking and there is little research in the English-speaking Caribbean that examines exercise and physical activity in the elderly. This study examined the extent of engagement and the socio-determinants of physical exercise in elderly men in Jamaica.

Materials and Methods

The study used primary cross-sectional survey data on men 55 years and older from the parish of St. Catherine in 2007; it is also generalizable to the island. The survey was submitted and approved by the University of the West Indies Medical Faculty's Ethics Committee. A stratified multistage probability sampling technique was used to draw the sample, and a 132-item questionnaire was used to collect the data. The instrument was sub-divided into general demographic profiles of the sample; past and current good health status; health-seeking behavior; retirement status; social and functional status. The overall response rate for the survey was 99% (n = 1,983).

The Statistical Institute of Jamaica (STATIN) maintains a list of enumeration districts or census tracts in all parishes in Jamaica including St. Catherine. The parish of St. Catherine was chosen, as previous data and surveys [21, 22] suggest that it has the mix of demographic characteristics (urban, rural, and age-composition) which typify Jamaica. The parish of St. Catherine had approximately 233,052 males, (preliminary census data 2001) of which 33,674 males were 55 years and older. St. Catherine is divided into several constituencies made up of a number of enumeration districts. The one hundred and sixty-two enumeration districts in the parish of St. Catherine provided the sampling frame. The enumeration districts were listed and numbered sequentially and the selection of clusters was arrived at by the use of a sampling interval. Forty enumeration districts (clusters) were subsequently selected with the probability of selection being proportional to population size. Using advice from STATIN and the C-Survey computer software (University of California at Los Angeles and University of Indonesia 1997), it was determined that 50 elderly men in each enumeration district were interviewed yielding a sample size of 2,000.

Measures

Happiness: This is measured based on people's self-reporting on their happiness. It is a Likert scale question, which ranges from always to rarely happy. Health Status: This variable is measured using people's self-rating of their overall health status, which ranges from excellent to poor health status. Questions in the 132-item questionnaire include socio-demographic variables such as education attained, engagement in regular physical exercise, type of physical exercise and health status as a child. The age group was categorized into three sub-groups. These are (1) ages 55 to 64 years; (2) ages 65 to 74 years; and (3) ages 75 years and older.

Functional status is the summation of Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). Performance of ADL is used to describe the lower functional status of a person. There are

systems such as the Katz ADL tool that seek to quantify these functions and obtain a numerical value [23]. These are useful for the prioritizing of care and resources. Scoring the ADL findings (Katz) Independence on a given function received a score of 1 point while if dependent, 0 point was given [24]. There were 14 items (including daily activities, household chores, shopping, cooking and paying bills). The reliability of the items was very high, $\alpha = 0.801$. Total scores ranged from 0-14 with lower scores indicating high dependence and higher scores indicating greater independence. The IADL tool [25] was used for assessing participants' difficulty with the complex task of daily living. The independent activities of daily living are more sensitive to subtle functional deficiencies than ADL's, and differentiate among task performance, including the amount of help needed to accomplish each task. Due to the fact that the study was being conducted among men only, some tasks which are normally done by women would not apply. This is consistent with international practice, the University of Wollongong's modified IADL functional ability scale which uses a scale of 5 points for men and eight for women was used to assess the IADL functional ability of men in the study [26].

Consequently, the domains of food preparation, laundry and housekeeping were omitted in this study with regard to the IADL for older men. The IADL scores reflect the number of areas of impairment i.e. the number of skills/domains in which subjects are dependent. Scores range from 0-5. Higher scores thus indicate greater impairment and dependence. Cohen and Holliday [27] stated that correlation can be low/weak (0 - 0.39); moderate (0.4 - 0.69), or strong (0.7 - 1). Hence, high dependence ranges from 0 to 5.5; moderate dependence is from 5.6 to 9.7 and low dependence (i.e., independence) ranges from 9.8 to 14. Independence means without supervision, direction, or active personal assistance. The performance on the functions can be further classified and analyzed using the format below. The classification recognizes that combinations of independence/dependence with respect to particular functions reflect the different degrees of capability with respect to ADL. The classification was used to further describe the functional status of men with regard to ADL. Also, as in Cohen and Holliday [27] correlation coefficients were used in the present study to exclude (or allow) a variable. Any variable that had a high correlation was excluded, as well as any variable that had a non-response rate in excess of 20 percent.

Statistical Analyses

Data were stored, retrieved and analyzed, using SPSS for Windows (16.0). For the current study descriptive statistics (frequency, percentages) were employed to provide background information on the sample; and chi-square was used to examine non-metric variables. Logistic regression was used to examine a binary dependent variable (i.e. physical exercise) and some socio-demographic variables (such as employment status, current health status, and health status in childhood, number of brother(s) and/or sister(s) alive). The level of significance was $P < 0.05$ and the only exclusion criteria were if more than 20% of the cases of a variable were missing.

Model

In order to examine the effect of many variables on a single dependent variable, the researcher used multivariate analysis to test a single model. Using the literature the current study investigates the correlates of physical exercise of older Jamaicans within the context of the available data. The proposed model that this research seeks to evaluate is displayed (Eqn1):

$$Ei = f(Hti, HAPPi, LSi, Ci, ARi, Ai, SSi, CAi, EDi, HHi, MSi, Pi, HEAi, EMi, Di, TMi, AMi, Fi, HPi, HOi, CFi, \sum Xij, \varepsilon i) \quad [1]$$

Where Ei (physical exercise) is a function of current good health status of person i, Ht; happiness, HAPPi; life satisfaction, LSi; children, Ci; area of residence, ARi; age group of respondent, Ai; social support, SSi; church attendance, CAi; educational level, EDi; head of household, HHi; marital status, MSi; number of person in household, Pi; poor health status in childhood, HAi; employment status, EMi; self-reported depression, Di; taking medication, TMi; health advise, HEAi; functional status, Fi; health plan, HPi; cognitive functionality, CFi; Xij is a vector of siblings alive of respondent i, which number of brother(s) and/or sister(s), and functional status, FSi.

All the variables were identified from the literature. Using the principle of parsimony, only those explanatory variables that were statistically significant ($p < 0.05$) were used in the final model to determine εi (i.e. physical exercise) of older men in Jamaica. This final model identified the correlates of εi of older men in Jamaica (Eqn 2).

$$Ei = f(EDi, Ai, Ht, HHi, HPi, EMi, SSi, \varepsilon i) \quad [2]$$

Results

Demographic Characteristics

Of the respondents (n = 2,000), 82.5% indicated that they had good health in their childhood; 55.4% reported current good health status; 51.0% lived in rural areas; 3.5% were mostly satisfied with life; 10.4% had moderate to high functional dependence; 89.6% had low functional dependence (i.e. independence); 21.9% were aged 75 years and older; 35.6% were aged 65 to 74 years and 42.6% reported ages 55 to 64 years.

In addition, 94.1% had high cognitive function and 67.3% reported that they do some kind of physical exercise (Table 1).

Table 1 Socio-demographic characteristics of sample.

Variable	Frequency	Percent
Physical Exercise		
Yes	1345	67.3
No	655	32.8
Functional Status		
High dependence	24	1.2
Moderate dependence	184	9.2
Low dependence	1792	89.6
Cognitive Functionality		
Low	19	1.0
Moderate	99	5.0
High	1882	94.1
Age group		
55- 64 years	851	42.6
65 – 74 years	712	35.6
75 years and older	437	21.9
Employment Status		
Employed	511	25.6
Unemployed	412	20.6
Retired	1077	53.9
Happiness		
Rarely	480	24.0
Sometimes	1430	71.5
Most times	90	4.5
Self-rated Health Status		
Excellent	357	19.0
Good	1038	55.4
Fair	480	25.6
Life Satisfaction		
Rarely satisfied	658	32.9
Sometimes	1,272	63.6
Most	70	3.5
Childhood Health status		
Good	1650	82.5
Poor	350	17.5
Area of residence		
Urban	981	49.0
Rural	1019	51.0

One half of the sample indicated that they spent Ja. $100 (US $1.45) monthly for medical expenditure; 34% of the respondents bought their prescribed medication; 17.1% reported that they had been hospitalized since their sixth birthday and 65.8% reported that they took no medication. Concurringly, 17.7% of the sample reported that they were seriously ill as children and 17.5% indicated that they were frequently ill during childhood. Almost 35% reported that the illness was measles or chicken pox, 26.3% indicated asthma, 10.0% pneumonic fever, 8.9% poliomyelitis, 6.6% accident, 4.6% jaundice, 1.7% hernia, 9.2% hypertension, and 5.1% indicated gastroenteritis. Twenty four percent of elderly men indicated that they were rarely happy, 40.5% said sometimes, 31.0% mentioned often and only 4.5% reported always.

Table 2 revealed that of those who indicated involvement in physical exercise (n = 1,345), 77.2% jogged, ran, and/or walked; 13.3% did aerobics; 4.7% swam; 2.0% cycled and 0.6% did push-ups or sit-ups. Further examination of physical exercise by area of residence indicated that there was no statistical association between the two variables ($\chi 2$ square =10.60, p = 0.101); Table 3.

Table 2 Types of physical exercise.

Variable	Frequency	Percent
Type of physical exercise		
Job, run and/or walk	1038	77.2
Aerobics	179	13.3
Swim	63	4.7
Cycle	54	4.0
Skip	2	0.1
Push-ups and/or sit-ups	8	0.6

Table 3 Type of physical exercise engaged in by area of residence.

Types of physical exercise	Rural and Urban		Total n (%)
	Urban n (%)	Rural n (%)	
Jog, run, walk	502 (51.2)	536 (52.6)	1038 (51.9)
Aerobics	81 (8.3)	98 (9.6)	179 (9.0)
Swim	34 (3.5)	29 (2.8)	63 (3.2)
Cycle	21 (2.1)	33 (3.2)	54 (2.7)
Skip	1 (0.1)	1 (0.1)	2 (0.1)
Push-ups and/or sit-ups	1 (0.1)	7 (0.7)	8 (0.4)
None	341 (34.8)	315 (30.9)	656 (32.8)
Total	981	1019	2000

$\chi^2 = 10.60$, $P = 0.101$

Multivariate Analyses

Of the 22 variables tested in the current study [Eqn. (1)], 7 of them were found to predict physical exercise [Model (2)] (Table 4). These variables are education; age of respondents; current good health status; household head; health plan; employment status and social support. The model [Eqn (2)] used in the study had a statistically significant predictive power (model $\chi 2$ (24) =161.609, p < 0.001; -2 Log likelihood = 327.591; Hosmer and Lemeshow [28] goodness of fit $\chi 2$ = 5.456, P = 0.708). From the classification matrix, overall, 90.8% of the data were correctly classified: 97.3% of cases of physical exercise and 34.2% of cases that do not perform physical exercise. Furthermore, 40.6% of the variability in physical exercise can be explained by 7 predictors.

There was no multi-collinearity among variables because the correlation matrix has correlations of less than 0.55. The correlation between happiness and life satisfaction was 0.481 (r-squared). The correlation between self-reported depression and life satisfaction was

Table 4 Logistic regression of exercise and some variables in older men in Jamaica

Variable	Coefficient	Std Error	P	Odds Ratio	95.0% C.I.	
					Lower	Upper
Home ownership (1= yes)	-0.396	0.342	0.246	0.67	0.34	1.31
Cognitive functionality	-0.259	0.189	0.169	0.77	0.53	1.12
Have children (1=yes)	0.183	1.006	0.855	1.20	0.17	8.64
Self-reported depression (1=yes)	-0.316	0.317	0.320	0.73	0.39	1.36
Take medication (1=yes)	-0.096	0.311	0.758	0.91	0.49	1.67
Dummy education	-1.115	0.492	0.023	0.33	0.13	0.86
Dummy health advise	0.015	0.334	0.964	1.02	0.53	1.96
Functional status	-0.057	0.081	0.479	0.94	0.81	1.11
Church attendance	0.642	0.408	0.115	1.90	0.85	4.23
Area of residence (1= urban)	-0.081	0.316	0.797	0.92	0.50	1.71
Elderly (ages 65 to 74 years)	-0.937	0.405	0.021	0.39	0.18	0.87
Elderly (ages 75 years and older)	-1.747	0.457	0.000	0.17	0.07	0.43
†Elderly (ages 55 to 64 years)				1.00		
Current good health status	-0.995	0.394	0.012	0.37	0.17	0.80
Happiness	-0.107	0.357	0.765	0.90	0.45	1.81
Life satisfaction	-0.060	0.374	0.874	0.94	0.45	1.96
Poor childhood health status	0.310	0.373	0.406	1.36	0.66	2.83
Household head	0.846	0.385	0.028	2.33	1.10	4.95
Married	0.181	0.353	0.607	1.20	0.60	2.40
Separated, divorced or widowed	-0.027	0.459	0.952	0.97	0.40	2.39
†Single				1.00		
Health plan	0.925	0.426	0.030	2.52	1.09	5.82
Employment status (1= Employed)	-0.818	0.349	0.019	0.44	0.22	0.88
Number of brother alive	-0.276	0.519	0.595	0.76	0.27	2.10
Number of sister alive	0.071	0.434	0.870	1.07	0.46	2.51
Social support (1=yes)	-1.542	0.412	0.000	0.21	0.1095	0.45

χ^2 (24) = 161.609, P < 0.001**,** -2 Log likelihood = 327.591**,** Hosmer and Lemeshow goodness of fit χ^2 = 5.456, *P* = 0.708, Nagelkerke R^2 = 0.406**,** Overall correct classification = 90.8%, Correct classification of cases of exercise = 97.3%, Correct classification of cases of do not exercise = 34.2%. †Reference group.

r = 0.138, and between employment status and elderly (ages 65 to 74 years), r = 0.301. The correlation between health status and happiness was r = 0.035; self-reported depression and functional status r = 0.150; self-reported depression and poor childhood health status r = 0.110; and church attendance and social support r = 0.524. In addition, the association between functional status and cognitive functionality was r = - 0.164.

Of the 7 predictors of physical exercise in older men, age (ages 65 to 74 years: Wald statistic = 5.338, OR = 0.392, 95%CI = 0.177, 0.868; ages 75 years and older – Wald statistic = 14.646, OR = 0.174, 95%CI = 0.071, 0.426) and social support (Wald statistic = 14.036, OR = 0.214 95%CI = 0.095, 0.479) accounted for the most of the explanation of physical exercise of older men in Jamaica. Older men with current good health were less likely to become involved in physical exercise (OR = 0.370, 95%CI: 0.171, 0.801) than those with poor health status. Employed men were less likely to perform physical exercise than unemployed men (OR = 0.441, 95% CI: 0.223, 0.875) and those with a health insurance plan were more likely to perform physical exercise (OR = 2.522, 95%CI: 1.094, 5.816).

Discussion

The majority of the respondents reported that they had good health status and were sometimes happy. Approximately two thirds reported that they did some kind of physical exercise. There are studies among adults which suggest that knowledge and beliefs about the health effects of physical activity are positively associated with current physical activity levels [29]. Perceived enjoyment of and satisfaction with life are positive predictors of physical activity in both men and women of all ages [30]; however, intentions to be physically active do not necessarily predict subsequent participation [31]. Concurringly, older men in this study did not acknowledge the association between exercise and disease management. While the effects of physical activity on health status may be measured primarily by the physiologic changes that accompany increased aerobic fitness, [32] recent data suggest that

such changes may have an independent positive impact on various health indicators. Indeed, a growing body of epidemiological literature shows significant relationships between low- and moderate-intensity activities and reduced all-cause mortality, [33] as well as morbidity and mortality from cardiovascular disease, stroke, cancer, and respiratory disease [34, 35].

The Caribbean has demonstrated an increasing prevalence of type 2 diabetes mellitus associated with obesity due to the recent transition to a high consumption of energy dense foods and increasing inactivity [36]. In Jamaica, the adjusted prevalence rates (95% CI) are 9.5% for men and 15.7% for women in a population of 2.6 million [37]. Physical activity is inversely associated with both the prevalence [38] and incidence [39] of type 2 diabetes mellitus. Moderate physical activity significantly reduces the risk of developing type 2 diabetes mellitus. Perry et al. [40] reported a relative risk of type 2 diabetes mellitus in moderately active men of 0.4 compared with inactive men. Manson and Spelsberg [41] and Hu et al. [42] have also found that between 30 and 50% of new cases of type 2 diabetes mellitus could be prevented by moderate or vigorous physical activity. A recent randomized controlled trial by Tuomilehto et al. [43] of those at high risk of type 2 diabetes mellitus found that those who were offered nutrition and physical activity counseling and guidance (intervention group) experienced a significantly reduced risk of type 2 diabetes mellitus compared with the inactive control group. The effect of physical activity on type 2 diabetes mellitus incidence is probably explained partly by weight reduction and maintenance, and partly by its positive influence on glucose utilization and insulin sensitivity [44].

The study found that 9 out of every 100 older men had hypertension. Ragoobirsingh and colleagues reported that Jamaica has a point prevalence of hypertension of 30.8% in the 15 years and over age group [45]. The effects of physical activity on the reduction and prevention of hypertension have been proven by several well-documented studies [46, 47]. A prospective cohort study by Hayashi et al. [48] examined the effects of walking to work on the risk of hypertension in 6,017 Japanese men. Relative risk analysis determined that for every 26.3 men who walked 20 minutes or more to work, one case of hypertension would be prevented [48]. This suggests that regular light intensity activity in the form of walking can reduce hypertension. Young and colleagues [49] conducted a study that compared intensity levels for the reduction and prevention of hypertension in the United States. They examined the blood pressure of 62 sedentary elderly individuals who were participating in either a 12-week moderate intensity aerobic programme or a light-intensity Tai Chi programme. Blood pressure was lowered in both groups with no significant difference between the two activity levels [49]. Therefore, hypertension can be controlled by regular physical activity even at low levels of intensity.

Several epidemiological studies indicate that physical activity offers partial protection against primary or secondary events of coronary heart disease (CHD) and associated mortality among middle-aged and older men [50]. This is true in older men in whom disability is particularly frequent [51]. In the Goteborg study, the most active men, after 20 years of follow-up, had a relative risk of death from CHD of 0.72 [52]. In the British Heart Study, light, moderate and vigorous activity reduced mortality and heart attacks in older men by 0.61 and 0.65 respectively [53]. In the Honolulu Heart Program, the risk of CHD was reduced in physically capable elderly men with the distance walked [54]. Various factors have been implicated in this beneficial effect: a lipid-lowering effect [55], increased insulin sensitivity [56], reduced arterial pressure [57], increased coronary vasodilatory capacity [58] and coronary perfusion [59], correction of endothelial dysfunction [60], and the antiarrhythmic effect due to the reduction of heart rate and sympathetic activity [61]. Similarly, experimental [62] and clinical [63] studies have demonstrated that physical activity can correct most of the cardiovascular alterations induced by aging.

The current study also revealed that of those older men who participated in physical exercise most of them walked or jogged. In addition most of the men in the study had high cognitive functionality and enjoyed good health. Heikkinen and colleagues [64] found that more physically active individuals show a higher level of self-reported health and low prevalence of chronic disease. Duration of activity is also important with elderly men walking less than 0.25 miles/day having 2.04 times an increased risk of CHD compared with men walking over 1.5 miles/day [65]. Furthermore, several trials [66-68], most lasting for some months, have failed to demonstrate any benefit of exercise interventions on cognitive function among older adults, while other trials [69-72] have found improved cognitive performance with physical activity. It is possible that physical activity may prevent cognitive decline but not improve cognitive performance during a short period in otherwise high functioning elderly persons. This is plausible if physical activity–induced effects are associated with long-term protective benefits, such as a reduction in cardiovascular or cerebrovascular risk factors, but not in short-term effects. Regular physical activity may reduce serum lipid levels and hypertension and increase cardiovascular fitness [68] all of which could reduce the risk of vascular dementia and Alzheimer's disease [73]. Indeed, Rogers and colleagues [74] found that active elderly persons had fewer declines in cerebral blood flow during a 4-year period compared with less active elderly persons, a mechanism that might help maintain cognitive function by maintaining vascular function.

Aerobic activity is important for the prevention and control of coronary heart disease. Just over one-tenth of the men in the study were engaged in aerobic activities. Increases in duration and/or intensity appear to reduce the risk of CHD [75]. To promote and maintain health,

older adults need moderate-intensity aerobic physical activity for a minimum of 30 min on five days each week or vigorous intensity aerobic activity for a minimum of 20 min on three days each week. Also, combinations of moderate- and vigorous-intensity activity can be performed to meet this recommendation. Moderate-intensity aerobic activity involves a moderate level of effort relative to an individual's aerobic fitness. Realistic goals for aerobic activity will commonly be in the range of 30-60 min of moderate-intensity activity a day, as illustrated by the Health Canada recommendation for older adults [76]. Interestingly, cross-sectional [77] and randomized intervention [78] research involving older adults has found that moderate amounts of physical activity/aerobic exercise may protect against age-related declines of executive control. Indeed, Colcombe and Kramer [79] found that aerobic forms of exercise had general and selective effects that were beneficial to cognitive function in older adults. That is, despite their finding that aerobic exercise was beneficial across the breadth of cognitive processes studied (i.e., speed, visuo-spatial, controlled processing, and executive control), the effects were greatest for tasks, or task components, involving extensive executive control [79].

The determinants of physical exercise among the elderly men in this study were age, social support, current good health status, and being employed. Some personal characteristics appear to be particularly influential determinants of physical activity for older adults including males. For instance, poor physical condition and health status have been reported to be frequent barriers to participation in physical activity in older age groups [80, 81]. Other personal characteristics that may be especially important in shaping physical activity patterns for older adults include medical concerns and fears of injury [82, 83], as well as attitudinal barriers, such as perceived lack of ability and misconceptions or erroneous beliefs about exercise (e.g., that it must be strenuous or uncomfortable to be efficacious) [84, 85]. Therefore an understanding of the factors associated with physical activity or inactivity for the aging male may result in the development of effective interventions for promoting regular physical activity.

Conclusion

The majority of the elderly men was engaged in some form of physical activity and enjoyed good health status. An older man with medical conditions should engage in physical activity in a manner that reduces his risk of developing other chronic diseases. Given the breadth and strength of the evidence, physical activity should be one of the highest priorities for preventing and treating disease and disability in older men. Effective interventions to promote physical activity in older men in Caribbean countries such as Jamaica deserve wide implementation.

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