ORIGINAL ARTICLE

Factors Associated with Physical Activity in Jamaicans with Cardiovascular Disease

G Nelson, C Gordon

ABSTRACT

Objective: *Cardiovascular disease (CVD) is the leading cause of death in Jamaica. Physical activity (PA) participation has positive effects on some risk factors for CVD. Despite this, many remain physically inactive. This study examined factors (social support, exercise barriers and benefits) associated with PA level in Jamaicans with CVD.*

Methods: *A total of 158 adults (112 females, 46 males), mean age 51.7 (15) years, were recruited from the medicine outpatient clinic of a large teaching hospital in Kingston, Jamaica, over the period 2012 to 2015. Exercise barriers and benefits, social support for exercise and PA level were assessed using questionnaires. Pearson's correlation coefficient was used to determine the relationship between PA level in MET-minutes/week, social support, exercise barriers and benefits. The relationship between the variables (social support, exercise barriers and exercise benefits) and categories of PA level was also determined using a one-way analysis of variance. Statistical significance was determined by* $p < 0.05$.

Results: *There was a statistically significant difference between 'family' social support scores across the three categories of PA (low, moderate, high) (F = 3.919;* $p = 0.023$*). Perceived exercise barriers and benefits had no significant association with PA level.*

Conclusion: *These results indicate that PA promotion strategies aimed at persons with CVD must consider the role of available social support.*

Keywords: Cardiovascular disease, exercise barriers, physical activity, social support.

INTRODUCTION

Non-communicable diseases (NCDs) have been reported as being the leading cause of death in Jamaica, contributing to 68% of all deaths (1); cardiovascular diseases (CVDs) accounted for 32% of these deaths. The Jamaica Health and Lifestyle Survey (2), the most comprehensive lifestyle survey performed locally, revealed that over the period 2000 to 2008, the proportion of Jamaicans who were physically inactive had increased. This pattern has likely persisted to present day, as no significant large-scale intervention to reverse it has been done. These data are disturbing in view of the fact that it is well known that the effects of these CVDs can be mitigated with exercise. Regular exercise has positive effects on some of the risk factors that contribute to CVD. It reduces blood pressure, excess weight and cholesterol levels, and increases exercise tolerance, fitness levels and insulin sensitivity (3). Other benefits include improvement in muscular function and strength, improved endothelial responsiveness (4) and muscle blood flow, increased oxygen consumption and functional endurance (5). These are important for persons with chronic CVD, whose exercise capacity is usually lower than normal (3).

Despite the benefits of exercise, many individuals in Jamaica do not engage in sufficient physical activity (PA) (2). Physically inactive persons are twice as likely to develop coronary heart disease (6, 7). While it is suspected that the level of PA in persons with CVDs will not differ from the general Jamaican population distribution, no study assessing PA level in this group has been done. In a study conducted among 48 Jamaicans with diabetes (8), researchers sought to determine how knowledgeable

From: Section of Physical Therapy, Faculty of Medical Sciences, The University of the West Indies, 2 West Road, Mona, Kingston 7, Jamaica.

Correspondence: Miss G Nelson, Section of Physical Therapy, Faculty of Medical Sciences, The University of the West Indies, 2 West Road, Mona, Kingston 7, Jamaica.
Email: gail.nelson02@uwimona.edu.jm

 DOI: 10.7727/wimj.2017.112

they were about the benefits of exercise and their level of exercise participation. The majority (88%) of the participants had a good knowledge of the benefits of exercise, but there was no significant relationship between knowledge and exercise participation.

Perceived barriers are known to be determinants of exercise participation (9). Some of the barriers observed in persons with CVDs include negative perception towards health and changing events as a result of cardiac events, having low mood, low motivation and lack of interest to exercise, feeling physically restricted towards or fearful of exercise, lacking knowledge regarding exercise (10), and lacking social support (11).

Social support refers to the function and quality of social relationships, such as perceived availability of help or support actually received (12). It is also related to tasks or steps that significant others take to facilitate behaviour. Social support for PA may be described as instrumental (giving a non-driver a ride to an exercise class), informational (telling a neighbour about a community exercise programme), emotional (calling a friend to see how he/she is coping with a new exercise programme) and appraisal (providing encouragement or reinforcement for learning a new activity) (13). There is still some inconsistency regarding the relationship between social support and PA. Social support from family and friends has been positively related to adult physical activity levels (9, 14–16). Eyler *et al* (11) conducted a telephone survey over a 1-year period in which they evaluated social support for PA using the Physical Activity Social Support (PASS) questionnaire. A total of 2912 women, aged 40 years and over, participated. Those with low PASS were more likely to be sedentary. In another study of 5167 Canadian men and women, aged 15–79 years, the effect of social support on PA was examined (17) and social support was not observed to have a significant effect on PA level.

Not enough research has been conducted on the factors influencing PA participation in Jamaica. While the relationship between social support and PA has been examined in other populations, the findings may be different in Jamaica given that ethnicity has been shown to influence this relationship (11). This study examined factors (social support, exercise barriers and benefits) associated with PA level in Jamaicans with CVD.

SUBJECTS AND METHODS

Ethical approval was obtained from the university's ethics committee and permission was received from the hospital's senior medical officer and head of the department of Medicine. Persons were included if they attended the hospital's medicine outpatient department and had at least one chronic CVD. Participants who gave informed consent were asked to complete interviewer-administered questionnaires. The Social Support Survey for Diet and Exercise Behaviors (18) comprises two sections: for assessing social support for exercise behaviours, only items 11 to 16 and 20 to 23 were used (19). The scale consists of Likert-type items with responses ranging from 1 (none) to 8 ('does not apply'). Social support scores from 'friends' and 'family' were summed separately.

The scale has been found to be valid and reliable for use in adults 18 years old and over (20). The Exercise Barriers and Benefits Scale (21) comprises 43 items that evaluate the perceived barriers and benefits from exercise participation. The instrument may be scored and used in its entirety or as two separate scales. The instrument has a four-response, Likert-type format with responses ranging from 4 (strongly agree) to 1 (strongly disagree). When the 'benefits' items are used alone, the score range is between 29 and 116. When the 'barriers' is used alone, scores range between 14 and 56. In this instance, the higher the score on the barriers items, the greater the perception of barriers to exercise. Test–retest reliability assessment yielded a reliability coefficient of 0.953 for the benefits and 0.886 for the barriers scale which suggests it is a reliable instrument for assessing perceived benefits and barriers to PAs among different populations (21). The benefits and barriers scales were used separately in this study.

The International Physical Activity Questionnaire (22) was used to assess PA level (vigourous walking, sitting and moderate exercise) by self-report in persons aged 18–69 years. Physical activity was scored as 'low', 'moderate' and 'high' and in MET-minutes/week.

Data analysis

Pearson's correlation coefficient was used to determine the relationship between PA level in MET-minutes/week, social support, exercise barriers and benefits. The relationship between the variables (social support, exercise barriers and exercise benefits) and categories of PA level was also determined using a one-way analysis of variance. Statistical significance was determined by $p < 0.05$. Statistical analysis was done using the Statistical Package for the Social Sciences, version 19 (IBM Corp., Armonk, NY).

RESULTS

A total of 158 persons (112 females, 46 males), mean age 51.7 (15) years, participated. Approximately 50% of the respondents were unemployed or retired. A total of 57 respondents (36%) fell in the 'low' PA category, while 32 (20.3%) were in the 'moderate' PA group and 21 (13.3%) were in the 'high' PA category. The mean (SD) PA score in MET-minutes/week was 1239.9 (2865.3). The mean (SD) for social support, exercise barriers and benefits is shown in Table 1.

Table 1: Mean (SD) for variables

Variable	Mean (SD)
Physical activity level (MET-minutes/week)	1239.9 (2865.3)
Social support (family)	17.94 (8.98)
Social support (friends)	17.47 (9.18)
Exercise barriers	27.7 (7.5)
Exercise benefits	94.0 (12.5)

Relationship with PA

There was a negative correlation between age and the mean PA score (r = –0.007), but this was not significant (p = 0.951). There was no significant relationship between gender and PA level. The mean PA score was not significantly related to social support, exercise barriers and exercise benefits (see Table 2).

Table 2: Relationship between mean PA score and social support, exercise barriers and benefits

Variable	r	p-value
Family social support	0.06	0.579
Friends social support	0.069	0.524
Exercise barriers	–0.127	0.241
Exercise benefit	0.201	0.062

There was no significant difference in PA scores across employment status (retired, unemployed, employed) (F = 1.802; p = 0.153).

There was a statistically significant difference between 'family' social support scores across the three categories of PA (low, moderate, high) (F = 3.919; p = 0.023). Post-hoc tests revealed that the 'family' social support was significantly higher in the 'high' PA group compared to the 'low' PA group (p = 0.018). There was also a statistically significant difference between 'friend' social support scores across the three categories of PA (F = 7.000; p = 0.001). The 'friends' social support was significantly higher in both the high (p = 0.004) and moderate PA (p = 0.026) groups compared to the low PA group.

When exercise barriers were compared across the three PA categories, there was no significant difference (F = 0.122; p = 0.885). Neither did perceived exercise benefits differ across PA categories (F = 0.998; p = 0.372).

DISCUSSION

Cardiovascular disease is the leading cause of death globally. Physical inactivity is one of the major behavioural risk factors for CVD (1). This study sought to determine the correlates of PA in persons with chronic CVD. Approximately 50% of the participants were found to be in the low PA category. This was in keeping with data from a large population-based study in which approximately 45% of the Jamaican population was reported as physically inactive (2).

Although the perception of barriers to exercise was low, this did not translate to persons achieving the recommended levels of PA. The mean PA level (in MET-minutes/week) fell within the low PA category. This was surprising given that there was a high perception of the benefits of exercise. There are, however, many other determinants of PA and exercise, such as self-motivation, social reinforcement, family influences and access to exercise facilities (23), which were not examined in this study.

Social support has been defined as non-verbal or verbal communication which aims to improve feelings of coping and competence (24). Social support for exercise was poor, overall. The mean scores from family and friends were 36% and 35%, respectively. This is similar to findings from the Adeniyi *et al* (25) study which states that 99.8% of participants experienced low social support for exercise. This study found that social support from friends and family was a positive influence on PA. Other studies have also reported similar findings (11, 22, 25). Healthcare and exercise professionals must evaluate the social support for exercise that is available, in attempting to influence exercise behaviours of persons with cardiovascular conditions.

Our study revealed a negative correlation between perceived barriers and PA (MET-minutes/week); however, this trend did not achieve significance. These findings conflict with those of Adeniyi *et al* (25) who found that higher perceived barriers were significantly related to low PA level. This may have been due to the differences in sample size.

To our knowledge, this is the first study that has assessed factors influencing PA in Jamaicans with CVD. A few limitations must be mentioned. The PA

level was measured by self-report. Respondents are known to overestimate their PA participation by this method. The cross-sectional nature of the study does not allow us to determine causal relationships between the factors and PA.

CONCLUSION

Engagement in PA is a major factor affecting cardiovascular risk. Social support has a strong influence on PA participation in Jamaicans with CVD. Health promotion strategies should encourage friends and family of persons with CVD to offer support for exercise.

ACKNOWLEDGEMENTS

The authors would like to thank physical therapy students (Andre Whyte, Sudan Reid, Sara-Kay Roye, Marsha-Lee Hutchinson) of the University of the West Indies for their assistance with data collection.

AUTHORS' NOTE

Both authors contributed to the development of the manuscript. The authors declare no conflict of interest.

REFERENCES

1. World Health Organization: Global status report on non-communicable diseases. [Accessed 1 November, 2017]. Retrieved from: http://apps.who.int/iris/bitstream/10665/148114/1/9789241564854_eng.pdf?ua=1
2. Wilks R, Younger N, Tulloch-Reid M, McFarlane S. Francis D. Jamaica Health and Lifestyle survey – Technical Report. [Accessed 12 September 2015]. Retrieved from: http://moh.gov.jm/wp-content/uploads/2015/05/Jamaica-Health-and-Lifestyle-Survey-2007-8.pdf
3. Myers J. Exercise and cardiovascular health. Circulation 2003; 107: e2–e5. [Accessed 7 January, 2015]. Retrieved from: http://circ.ahajournals.org/content/107/1/e2.full#xref-ref-1-1
4. Hambrecht R, Fiehn E, Weigl C, Gielen S, Hamaan C, Kaiser R et al. Regular physical exercise corrects endothelial dysfunction and improves exercise capacity in patients with chronic heart failure. Circulation 1998; **98:** 2709–15.
5. McArdle WD, Katch FI, Katch VL. Exercise physiology: nutrition, energy, and human performance. Baltimore: Wolters Kluwer; 2015.6.
Prasad DS, Das BC. Physical inactivity: a cardiovascular risk factor. Indian J Med Sci 2009; **63:** 33–42.
7. Powell KE, Thompson PD, Caspersen CJ, Kendrick JS. Physical activity and the incidence of coronary heart disease. Ann Rev Public Health 1987; **8:** 253–87.
8. Hall M, Gordon C. Knowledge of the benefits of exercise and exercise participation in persons living with diabetes in Kingston and St. Andrew, Jamaica [Abstract]. West Indian Med J 2012; **61 (Suppl):** 7.
9. Dishman RK, Sallis JF. Determinants and interventions for physical activity and exercise. In: Bouchard C, Shepard RJ, Stephens T, eds. Physical activity, fitness and health. Illinois: Human Kinetics; 1994: 214–38.
10. Rogerson MC, Murphy BM, Bird S, Morris T. 'I don't have the heart': a qualitative study of barriers to and facilitators of physical activity for people with coronary heart disease and depressive symptoms. Int J Behav Nutr Phys Act 2012; **9:** 140–8.
11. Eyler AA, Brownson RC, Donatelle RJ, King AC, Brown D, Sallis JF. Physical activity social support and middle- and older-aged minority women: results from a US survey. Soc Sci Med 1999; **49:** 781–9.
12. Schwarzer R, Leppin A. Social support and health: a meta-analysis. Psychol Health 1989; **3:** 1–8.
13. Israel BA, Schurman SJ. Social support, control and the stress process. In: Glanz K, Lewis FM, Rimer BK, eds. Health behavior and health education: Theory, research and practice. San Francisco: Jossey-Bass; 1990: 179–205.
14. Sallis J, Hovell MF, Hofstetter CR. Predictors of adoption and maintenance of vigorous physical activity in men and women. Prev Med 1992; **21:** 237–51.
15. Felton G, Parson M. Factors influencing physical activity in average-weight and overweight young women. J Community Health Nurs 1994; **11:** 109–19.
16. Gibbison GA, Johnson CD. Stages of change in physical exercise and social support: an integrated socio-psycho-economic approach. J Appl Soc Psychol 2012; **42:** 646–68.
17. Pan SY, Cameron C, Meules MD, Morrison H, Craig CL, Jiang XH. Individual, social, environmental, and physical environmental correlates with physical activity among Canadians: a cross-sectional study. BMC Public Health 2009; **9:** 21.
18. Sallis J, Grossman R, Pinski R, Patterson TL, Nader PR. The development of scales to measure social support for diet and exercise behaviors. Prev Med 1987; **1:** 825–36.
19. Sallis JF (nd). Measures. [Accessed 9 January 2014] Available from: http://sallis.ucsd.edu/measure_socialsupport.html
20. Noroozi A, Ghonfranipour F, Heydarnia AR, Nabipour I, Shokravi FA. Validity and reliability of the social support scale for exercise behaviour in diabetic women. Asia-Pac J Public Health 2011; **23:** 730–41.
21. Sechrist K, Walker S, Pender N. Development and psychometric evaluation of the exercise benefits/barriers scale. Res Nurs Health 1987; **10:** 357–65.
22. The International Physical Activity Questionnaire. [Accessed 8 January 2015]. Available from: http://www.ipaq.ki.se/
23. Dishman RK, Sallis JF, Orenstein D. The determinants of physical activity and exercise. Pub Health Rep 1985; **100:** 158–71.
24. Mattson M, Gibb Hall J. Health as communication nexus: a service learning approach. 1st ed. Iowa: Kendall Hunt Publishing Co; 2011.
25. Adeniyi AF, Idowu OA, Ogwumike OO, Adeniyi CY. Comparative influence of self-efficacy, social support and perceived barriers on low physical activity development in patients with type 2 diabetes, hypertension or stroke. Ethiop J Health Sci 2012; **22:** 113–8.