

# FACTORS ASSOCIATED WITH PARTICIPATION IN PHYSICAL ACTIVITY AMONG ADULTS WITH HYPERTENSION IN KIGALI, RWANDA

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## ABSTRACT

Hypertension is one of the most common non-communicable diseases, and it is the leading cause of cardiovascular diseases, death and disability worldwide, especially in developing countries. Physical activity has been regarded as a commonly accepted modality for preventing and treating hypertension. However, despite its known benefits, this modality of treatment and prevention of hypertension continues to be underused. The present study aimed to determine the demographic, social and health-related factors that are associated with levels of physical activity participation among adults with hypertension in Kigali, Rwanda. This cross-sectional study was conducted with 252 adults with hypertension through the Godin Leisure-Time Exercise Questionnaire (GLTEQ). Two thirds of the participants (69.44%) were classified as sedentary. The following factors were found to be significantly ( $P<0.05$ ) associated with the levels of physical activity: age, marital status, and level of education, residence, past and current tobacco users, current alcohol user, diabetes mellitus, body mass index (BMI), and blood pressure. The findings of the present study highlight the need for the implementation of health promotion strategies aimed at promoting physical activity lifestyle among individuals with hypertension in Rwanda.

**Keywords:** Physical activity, Exercise, Hypertension, High blood pressure, Rwanda

## Introduction

Non-communicable diseases (NCDs) which include cardiovascular disease (CVD), are the leading causes of death and disability worldwide (Deaton et al., 2011). Hypertension is an important risk factor of CVD worldwide. By the year 2030, CVD is predicted to account for 41% of all deaths in working-age individuals in developing countries such as in Sub-Saharan Africa (Frost & Topp, 2006). It is stated that hypertension is at higher risk of CVD, ischemic heart disease, cardiac and renal failure. These major underlying diseases share key risk factors, mainly the lack of physical activity, unhealthy diet, tobacco and alcohol use (Yach, Hawkes, Gould & Hofman, 2004).

Epidemiological studies have shown that physical inactivity is associated with hypertension (Bronas & Leon, 2009). Physical inactivity is recognised as the result of the urbanisation leading to an increase in consumption of energy rich foods and a decrease in energy expenditure (through less physical activity) in developing countries (Hayman & Hughes, 2005). Furthermore, urban growth rate in Africa is estimated at 4.3% compared to 0.5% in Europe. Various researchers have shown that hypertension in Sub-Saharan Africa is in high prevalence. Moreover, rapid urbanisation with global influences on lifestyles in Africa and other developing countries lead to a decrease physical

activity (Addo et al., 2007). Inactivity was associated with higher body mass index, blood pressure and fasting blood glucose levels, observed in men than women (Sobngwi et al., 2002).

Thus, it is necessary for adults with hypertension to reduce the incidence of hypertension and blood pressure levels through lifestyle modifications like exercise and dietary habits (Bronas & Leon, 2009). The picture of physical inactivity in developed countries is mirrored in developing countries such as Rwanda. Between 1991 and 2000, the urban population increased from 235 664 to 600 000 in Kigali city, Rwanda due to natural population growth, rural exodus, and return of refugees who lived in foreign countries after the war of 1994 (Rwandan Ministry of Finance, 2001).

Considering the increasing prevalence of hypertension in developing countries such as Rwanda, the researcher felt the need to assess the following; levels of physical activity among adults with hypertension, and factors associated with it. The current study will thus attempt to address this gap in the literature. The aim of this study was to determine the demographic, social and health-related factors that are associated with levels of physical activity participation among adults with hypertension in Kigali, Rwanda.

## Method

The study was conducted at the two biggest health care facilities in Kigali, the capital city of the Republic of Rwanda namely “Polyclinic La Médicale” and “Polyclinic du Carrefour”. The quantitative study used a cross-sectional, descriptive design. Adult hypertension patients aged 18-80 (mean age 49.75 years) receiving treatment and follow up care at clinics mentioned above, who voluntarily agreed to participate in the study, were included in the sample (252 participants).

Data were gathered using a self-administered questionnaire adapted from the Godin Leisure-Time Exercise Questionnaire (Godin & Shephard, 1985), and was modified to suit the objectives of this study. The questionnaire included the socio-demographic and health-related characteristics such as age, gender,

marital status, level of education, residential area, height and weight measurements, history of tobacco and alcohol use and diabetes, BMI, and blood pressure readings. Participants were asked to respond to, how many times on average per week, they participated in some form of exercises, for more than 15 minutes. Those exercises included strenuous, moderate and mild exercises.

Prior to the fieldwork, the questionnaire was translated from English to Kinyarwanda (One common language used by the majority of Rwandan people as the national language) by a professional translator. In addition, the questionnaire was pilot tested at two clinics on 18 individuals with hypertension who were not included in the study. Data were analysed using Statistical Package for Social Sciences (SPSS) version 19.0.

## Results

Out of 260 participants with hypertension approached to participate in the study, 96.9% (n=252) agreed to participate in the study. The participants' age ranges from 18 to 80 years, with the mean age of the study being 49.75 years. Furthermore, of the 252 respondents, 43.7% (n=110) were males and 56.3% (n=142) were females.

Participants were categorized into sufficiently active or sedentary based on accumulated Metabolic Equivalent of Tasks (METs) per week. Males had to accumulate at least 38 METs per

week or females at least 35 METs per week (Elos'a et al., 2000; Jacobs, Ainsworth, Hartman & Leon, 1993). Based on the above criteria, (69.44%, n=175) and (30.56%, N=77) of the total sample was categorized as sedentary and active respectively.

Most of the socio-demographic characteristics were significantly ( $p < 0.01$ ) associated with the levels of physical activity such as age, marital status, level of education and residence. However, gender was not related to levels of physical activity ( $p > 0.05$ ).

**Table 1 Socio-demographic factors with levels of physical activity (n= 252)**

Variable	Characteristics	Sedentary 52.73 Frequency, (%)	Active 42.99 Frequency, (%)
<b>Mean age**</b>			
<b>Gender</b>	Male	83 (47.43)	27 (35.06)
	Female	92 (52.57)	50 (64.94)
<b>Marital status*</b>	Not married	60 (34.29)	42 (54.55)
	Married	115 (65.71)	35 (45.45)
<b>Education levels*</b>	Never went to school	10 (5.72)	12 (15.58)
	Primary school	43 (24.57)	31 (40.26)
	Secondary school	77 (44.00)	25 (32.47)
	Tertiary education	45 (25.71)	9 (11.69)
<b>Residence*</b>	Urban	171 (97.71)	68 (88.31)
	Rural	4 (2.29)	9 (11.69)

\*Significant ( $p < 0.01$ ) based on the chi-square test.

\*\*Significant ( $p < 0.01$ ) based on the Student's t test.

Most of health-related factors were significantly ( $p < 0.05$ ) associated with the levels of physical activity such as past and current tobacco users, current alcohol user, diabetes mellitus, BMI, and blood pressure. However, for the alcohol use, the past users were not related to physical activity levels ( $p > 0.05$ ).

**Table 2 Health-related factors with levels of physical activity (n= 252)**

Variable	Characteristics	Sedentary Frequency, (%)	Active Frequency, (%)
<b>Tobacco use</b>	Past user* Yes	27 (15.43)	1 (1.30)
	No	148 (84.57)	76 (98.70)
	Current user* Yes	17 (9.71)	0 (0.00)
	No	158 (90.29)	77 (100)
<b>Alcohol use</b>	Past user Yes	68 (38.86)	22 (28.57)
	No	107 (61.14)	55 (71.43)
	Current user* Yes	51 (29.14)	11 (14.29)
	No	124 (70.86)	66 (85.71)
<b>Diabetes mellitus*</b>	Yes	53 (30.29)	4 (5.19)
	No	122 (69.71)	73 (94.81)
<b>BMI categories*</b>	Underweight	4 (2.29)	8 (10.39)
	Normal weight	48 (27.43)	50 (64.93)
	Overweight or obese	123 (70.28)	19 (24.68)

\*Significant ( $p < 0.01$ ) based on the chi-square test.

\*Significant ( $p < 0.05$ ) based on the chi-square test.

**Table 3 Blood pressure with levels of physical activity (n= 252)**

Variable	Sedentary Mean, (SD)	Active Mean, (SD)
Blood pressure (BP) Systolic BP**	138.41 (10.26)	130.45 (8.08)
Diastolic BP**	87.53 (8.91)	80.82 (7.27)

\*\*Significant ( $p < 0.01$ ) based on the Student's t test.

## Discussion

Various researchers have reported a decline in physical activity with advancing age (Amanda, 2010). The findings of the current study showed that more than half of participants were categorised as inactive and had a significantly higher mean age of 52.73 years, compared to those active, whose mean age was 42.99 years. This could be explained by the fact that young people are more likely to engage in physical activity compared to older ones, even in the general population. A study by Buman, Yasova and Giacobbi (2010) revealed that the overall participation in physical activity significantly decreases with increasing age. Age was identified as one of the factors which induce adults to initiate and maintain regular physical activity, therefore, healthcare programmes should be focused on older adult patients.

Marital status is an important determinant for physical activity participation (Petee et al., 2006). Carmichael, Duberley & Szmigin (2015) has shown that being married was negatively related to physical activity or exercise in a group of women. This is in accordance with the findings of the present study which revealed that the majority of participants who were active were not married (54.55%). This is not surprising as unmarried individuals with hypertension face less life responsibilities, family expenses and constraints, compared to those who are married.

However, these findings are contrary to those of Pettee et al. (2006) which indicated that compared to those unmarried counterparts, married men and women reported higher levels of physical activity. Despite the differences of life responsibilities between unmarried and married people, married individuals in general, and particularly those with hypertension, should be encouraged and motivated to participate in physical activities. In addition, precautions like serious health education and increasing physical activity are needed.

Recent studies have reported that higher levels of education and income are related to lower levels of physical activity (Sávio, Da Costa, Schmitz & Da Silva, 2008; Orsini, Bellico, Bottai, Pagaro & Wolk, 2007). This is in accordance with the findings of the current study which indicated that the most participants who were classified as active had either a primary or a secondary school level of education. In contrast, those who reached the tertiary level of education were found to be mainly inactive. These findings suggest that the level of education is inversely proportional to the levels of physical activity. This could be explained that people with low levels of education are more likely to have heavier or more physically demanding jobs in contrary to those with higher levels of education that tend to have lighter or more sedentary jobs. Therefore, given the fact

that individuals with higher levels of education (tertiary level) were found to be mainly sedentary, they may be considered as an at-risk group for complications and morbidities-related to hypertension.

Engaging in jobs with minimal physical activity is the main reason for high hypertension in urban populations compared with rural populations (Addo et al., 2007). A Cameroonian study was conducted by Sobngwi et al. (2002), to evaluate and compare physical activity and its relationship with obesity, hypertension and diabetes in urban and rural areas. The study found that urban participants were physically inactive with light occupation, high prevalence of multiple occupations, and reduced walking and cycling time compared to rural participants. This would explain why a higher prevalence of participants from urban (97.71%) than participants from rural (2.29%) were considered to be physically inactive in the current study. This can be explained that most of the families in the rural areas in Rwanda hire the services of people from rural areas for their house-keeping duties such as cooking, babysitting, house cleaning or gardening as most family members are workers. In addition, those who did not attend school rely on agriculture, farming and house-keeping activities for their living.

Smoking reduces the capacity of the circulatory system, which diminishes exercise duration, increases blood pressure, and elevates heart rate (Papathanasiou et al., 2007). Moreover, DeRuiter, Faulkner, Cairney and Veldhuizen (2008) also conducted a study to establish the prevalence of physical activity among smokers.

They found that only 22.6% of participants were physically active. This would explain why a high prevalence of participants who were either non past users (98.70%) or non current users (100%), were found to be active than those reported to be smokers. Therefore, health promotion campaigns are necessary to reduce or stop smoking among people in general and especially those suffering from hypertension, by integrating physical activity into their daily routine to reduce elevated high blood pressure, and to have other benefits such as, mental and physical well-being.

Many studies have found that there is an association between alcohol intake and blood pressure (Tomson & Lip, 2006). Lifestyle factors such as alcohol use greatly influence a person's level of physical activity (Nelson et al., 2010). This association has been observed among adults with hypertension where a high prevalence of participants who were either non past users (71.43%) or non current users (85.71%), were found to be active than those reported to be drinkers. Therefore, reduction in alcohol consumption by increasing physical activity in daily routine is recommended in management of hypertension. Health-care professionals need to identify and address the risk of cardiovascular diseases caused by the alcohol use.

Sobngwi et al. (2002) have shown that diabetes was associated with physical inactivity. Diabetes was also found to be one of predictors of low physical activity level (Martins et al., 2009). This is in accordance with the findings of the current study which indicates that a significantly higher prevalence of participants who never diagnosed

with diabetes mellitus were found to be active (94.81%) in comparison to those who are suffering from diabetes mellitus (5.19%). Adults with hypertension in general and those who are diagnosed with diabetes in particular, should be encouraged to integrate physical activities in their daily lives. Effective intervention to prevention of the rising of NCDs such as hypertension and diabetes is much needed.

Wamala et al. (2009) stated that most people with high blood pressure are in most cases overweight or obese. Physical activity is recommended as a component of weight management as the primary treatment for obesity (Donnelly et al., 2009). However, in the study by Sobngwi et al. (2002), high BMI was associated with physical inactivity. This concurs with the results of this study which observed the relationship between BMI and physical activity and 70.28% of overweight or obese participants were sedentary. Therefore, this population should be informed to reduce weight as it is believed that weight reduction is an important intervention for primary prevention of hypertension. Therefore, more emphasis should be placed on prevention of weight gain in the general population, particularly in people with hypertension. Physical activity has a positive effect on weight loss, and therefore on risk reduction of hypertension.

It is widely accepted that physical activity is considered to be cornerstone in the management of hypertension. In the study by Sobngwi et al. (2002), the physical inactivity was related to high levels of blood pressure. Physical activity is recommended as both a primary and adjunctive treatment option for successful lowering of blood pressure (Bronas & Leon, 2009). This was supported by the study conducted by Frost and Topp (2006) which found that regular physical activity of moderate intensity, performed on most days (such as brisk walking 30min/day) lowers systolic and diastolic blood pressure by 4 to 9 mmHg. Various researchers have shown the reduction of elevated blood pressure resulting from physical activity. This concurs with the results of the present study which observed a statistically significant reduction of the systolic and diastolic blood pressure among the participants who were physically active. Therefore, people with hypertension should be encouraged to engage in physical activity in order to control their raised blood pressure and other existing risk factors, such as adverse lipid profiles, overweight and obesity, insulin resistance, depression and social isolation (Bronas & Leon, 2009; Wamala et al., 2009). Regular, moderate to vigorous physical activity can provide adults with important physical, chronically diseases of lifestyle, mental and social benefits.

## Implications for practice

General population and particularly people with hypertension, should be encouraged and motivated to participate in physical activity. Government and the Ministry of Health (MoH) should advocate for the need to integrate programmes of physical activity in work, school and various common settings. This should be encouraged and supported with accessibility to

programme facilities and equipment. MoH also needs to increase the awareness of risks of physical inactivity, motivate patients with important health benefits of physical activity like psychological and physiological benefits, increase availability and accessibility of physical activity facilities to people with hypertension, and provide a supportive environment.

## Conclusion

Physical activity has proven itself as one of the strategies to be used in the management of elevated blood pressure, therefore the general population and particularly people with hypertension, should be encouraged and motivated to participate in physical activity. Regular, moderate to vigorous physical activity

can provide adults with important physical, chronically diseases of lifestyle, mental and social benefits. However, it is more valuable to have clarity on how physical activity is as important as pharmacologic intervention for many medical conditions.

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