ORIGINAL ARTICLE

Anthropometry and cardiovascular disease risk factors among retirees and non-retirees in Ile-Ife, Nigeria: A comparative study

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ABSTRACT

Background: Increasing affluence in low-income countries has been associated with lifestyle-related conditions, which may afford some people the opportunity to retire from gainful employment. This study examined the relationship between selected anthropometric variables and cardiovascular disease risk factors among age-matched retirees and non-retirees in Ile-Ife, Nigeria. **Materials and Methods:** Self-reported healthy adults (104 retirees and 99 age-matched non-retirees) were purposively recruited. Weight, height, waist circumference, systolic blood pressure and diastolic blood pressure were measured with standard equipment and procedures. An established questionnaire was used to classify the subjects into high, medium and low cardiovascular disease risk categories. The data were analysed with basic description and inferential statistics. **Results**: Mean ages for the retirees and non-retirees were 64.8 ± 7.0 years and 63.8 ± 4.5 years, respectively. The mean systolic blood pressure, diastolic blood pressure and waist circumference were higher for the retirees than for the non-retirees (all $P < 0.01$) as were the mean cardiovascular disease risk factors scores ($P < 0.01$). **Conclusion:** The study concludes that retirees have a higher risk for cardiovascular disease than non-retirees and weight and Body Mass Index are the major determinants. Studies are needed to explain the differences in body composition indices and cardiovascular disease risk factors between retirees and age-matched non-retirees

Key words: Antropometry, cardiovascular diseases, retirees, risk factors

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INTRODUCTION

Cardiovascular disease (CVD) is the major health problem in the industrialized world and is the major cause of death in the developed nations.[1-3] In sub-sahara Africa, CVD is not yet a leading killer but the trend is changing, particularly in urban areas,[4,5] as it accounts for about 9.2% of the mortality estimate for 2001 while infectious diseases such as human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) and malaria, maternal mortality and nutritional deficiencies remain major concerns.[6] Ischaemic heart disease and stroke have been ranked first and second among the 25 leading causes of death in 1990 and is expected to maintain these ranks in 2020.[6]

Access this article online

Quick Response Code:

Website: www.nigeriamedj.com

DOI: 10.4103/0300-1652.114568

Cardiovascular disease risk factors are traits and lifestyle habits that increase a person's chances of having coronary artery and vascular disease. Some risk factors are non modifiable such as age, gender and heredity, whereas other risk factors are modifiable such as high blood pressure, obesity, cigarette smoking, alcohol, high blood cholesterol, sedentary life style or lack of regular exercise, diabetes mellitus and unhealthy diet.[7] Socioeconomic status have been reported also as a determinant of CVD and its risk factors.[1,8]

Retirement is the point where a person stops work completely (or decides to leave the labour force after attaining a certain age usually 60 years and above.[9,10] Retirement has been identified to have a significant negative impact on the socioeconomic status of most retirees and elderly individuals.[11,12] Previously, life expectancy was low and the absence of pension arrangements meant that most workers continued to work until they were no longer able or until death. Nowadays, most countries have systems

to provide pension retirement in old age, which may be sponsored by employers and/or the state. However, in many poor countries, support for the old is mostly provided through family relations.

Retirement has been reported to affect both psychological and general health of the retiree.[9] Ogunbameru and Bamiwuye[10] viewed retirement as a passage that can result in psychological, physiological and economic problems. Retirees in Nigeria are faced with many thought-provoking and emotional disturbances, which may be due to delay or denial of their retirement benefits after an active service in the public or private sector. It is not known what effects sedentary lifestyle coupled with the stress of retirement verification exercise has on the retirees. Hence, this study was designed to examine the relationship between anthropometric variables and CVD risk as well as to assess the risk factors for CVD in a sample of retirees in Ile-Ife, Nigeria.

MATERIALS AND METHODS

This study was carried out among retirees of Obafemi Awolowo University (OAU) Ile-Ife and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) Ile-Ife. One hundred and four retirees participated in this study. The sample consisted of 53 men and 51 women whose ages ranged from 55 to 89 years. They all lived in Ile-Ife, Nigeria. The control group consisted of age-matched non-retirees (n = 99) who were either self-employed or gainfully employed by others. They were recruited from shops, workshops and trade and business places in Ile-Ife. The retirees were recruited based on the following criteria: Retirees of Obafemi Awolowo University (OAU) and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, who were not engaged in any form of employment after retirement.

Retirees that have completed their service term in service:

- Retirees who had attained 60 years or 65 years terminal age
- Retirees who had not voluntarily retired or were mandated to retire from public service prior to reaching retirement age.

Ethical clearance for the study was sought and obtained from the Ethical and Research Committee of OAUTHC, Ile Ife, prior to commencement of the study. All measurements and collection of data were obtained through various visits between 10 am and 12 pm at the premises of the pensioner's association secretariat of O.A.U retirees at Lagere Ile-Ife and OAUTHC Ile-Ife. Participants included 104 retirees including 53 men and 51 women. The control participants were recruited using purposive sampling technique from various business centers in Ile-Ife town. Consent was provided prior to each subject's participation.

The questionnaire for CVD risk factor assessment was adapted from the Framingham study.[13] Questions included age, sex, smoking habits, blood pressure, anthropometric variables (i.e., weight, height and waist circumference (WC)), stress, exercise habits, diet, medical history and family medical history. Scores were assigned as follows. For example, being male was assigned a score of '1' and being female was assigned a score of '0', and being over 56 years of age was scored '1' and being less being 56 year and below was scored '0'. Family history and personal history are the areas that had the highest scores; for subjects having relatives who had a heart or stroke before the age of 60 attracts score of 12. For subjects, who had a heart attack or vessel surgery themselves, a score of 20 was given. For each respondent, the score were summed to obtain an overall risk score. This score was used to classify them into high risk (40 and above), medium risk (20-39) and low risk (19 and below).

Blood pressure was measured using the electronic blood monitor kit (Omron; Omron Healthcare, incorporation, USA). Height was measured using a validated stadiometer. Weight was measured with a weighing scale in kilograms. WC was measured using a tape measure, with the level of the navel used as the reference point. Other information such as age, sex, medical history (history of diabetes mellitus), physical activities and lack of leisure time were also recorded. Body mass index (BMI) was obtained by dividing the weight by the square of the height ($BMI = W/H^2$).[14]

Both descriptive (range, mean, median mode and standard deviation) and inferential statistics were used for data analysis. Student t-test was used to compare the anthropometric and cardiovascular variables obtained from retirees and control participants. Spearman's correlation coefficient was used to find the relationship between physical characteristics and CVD risk scores. Levels of significance of the CVD risk scores of retirees and control was determine using Kruskal-Wallis test. The Statistical Package for the Social Sciences (SPSS) statistical software (version 16) was utilised for data analysis on a Microsoft windows Compaq laptop. Significance was set at 0.05 confidence level.

RESULTS

The physical characteristics of the subjects are presented in Table 1 which shows the mean age of retirees was 64.8 (±6.1) years while that of the control was 63.8 (±5.9) years. The result of independent t-test shows that there was no significant difference between the retirees' age and the control (P = 0.94). Table 2 shows the distribution of subjects into three CVD risk groups, the groups are Low risk (0-19 points), Medium risk (20-39 points) and High risk (40 points and above). The results showed that there was a preponderance of the retirees in the medium risk 43 (41.3%) when compared to their age group

counterparts in the control group 11 (11.1%). In the high-risk category, there were more retirees 15 (14.5%) when compared with the control group 1 (1.0%). The results also showed that majority of the control were at low risk 87 (87.9%) compared with their retiree counterparts 45 (44.2%).

The cardiovascular variables and risk scores of all the subjects are presented in Table 3, the mean systolic blood pressure (SBP) for retirees was 142.8 (±16.6) while that of the control was 130.2 (±14.40). The mean diastolic blood pressure (DBP) for retirees was 88.9 (±11.5) and the control group mean DBP was 78.9 (±11.6). Table 4 shows the result of Spearman' correlation for the relationship between age, anthropometric variables and CVD risk. A significant relationship exist between various anthropometric variables like height ($r = 0.015$; $P < 0.05$), weight ($r = 0.469$; $P < 0.05$), body mass index (BMI) ($r = 0.326$; $P < 0.05$) and CVD risk factors among retirees with the exception of WC ($P > 0.05$). Furthermore, a significant relationship exists between height ($r = 0.220$; $P < 0.05$); weight ($r = 0.511$; $P < 0.05$); BMI ($r = 387$; $P < 0.05$) and CVD risk factors among the control group.

Table 5 shows the result of *t*-test comparison among retirees and control group. Height, SBP, DBP, WC and CVD risk differed significantly ($P < 0.05$) between the retirees and control group with the retirees having higher values in SBP, DBP, weight, height and CVD risk scores.

DISCUSSION

The main objective of this study was to explore the relationship between anthropometric variables and CVD risk among retirees in addition to comparing CVD risk factors between retirees and age-matched non-retirees in Ile-Ife, Nigeria. The results of the study reported a significant relationship between the various anthropometric variables and CVD risk scores. A significant increase in anthropometric variables (weight, height and BMI) was associated with a an increase in CVD risk scores among both the retirees and age-matched non-retirees, this may be due to the increasing global prevalence of obesity, abnormal body composition, smoking and other risk factors for CVDs despite the fact that CVD have been linked with these risk factors. This finding is also in line with a past study among Nigerians were the prevalence of CVD was reported to be High.[14,15] In this study, it was also revealed that an increase in anthropometric variables (weight and BMI) significantly increases systolic and diastolic BP. This may be attributed to the fact that anthropometric variables are determinants of blood pressure as reported in similar past studies.[16]

The study also revealed that there was a significant difference in the CVD risk scores between retirees and non-retirees; the retirees were found to have higher CVD

Table 1: The analysis of physical characteristics of all the subjects

Variables	Retirees (Mean±SD) (*n*=104)	Control (Mean±SD) (*n*=99)	Total (Mean±SD) (*n*=203)	*t*-value	*P* value
Age (years)	64.7±7.0	63.8±4.5	64.0±6.7	−0.07	0.94
Height (m)	1.6±10.1	1.6±0.1	1.7±0.1	0.45	0.01**
Weight (Kg)	74.3±10.9	73.5±8.7	73.9±10.5	0.57	0.50
BMI (kg/m²)	26.5±4.2	27.9±3.5	26.8±4.2	−0.88	0.03*
WC (cm)	93.0±12.3	85.9±13.3	89.5±12.4	4.07	0.001**

BMI – Body mass index; WC – Waist circumference; Kg – Kilogram; m – Metre; cm – Centimetre; *Significant at *P*<0.05; **Significant at 0.01 alpha level

Table 2: Gender distribution of CVD risk scores

Variables	Retirees *n* (%)		Controls *n* (%)	
	Male *n*=53	Female *n*=51	Male *n*=51	Female *n*=48
Low risk (0-19)	33 (16.21)	13 (6.4)	43 (21.2)	44 (21.67)
Medium risk (20-39)	15 (7.4)	28 (13.8)	8 (4)	3 (1.5)
High risk (40 and above)	6 (3)	9 (4.32)	0 (0)	1 (0.5)

n – Number; % – Percentage; CVD – Cardiovascular disease

Table 3: Comparison of cardiovascular variables and CVD risk scores of all subjects (retirees and control)

Variables	Retirees mean (SD)	Control mean (SD)	*t*-value	*P* value
SBP (mmHg)	142.8±16.7	130.2±14.5	5.74	0.001**
DBP (mmHg)	89.0±11.5	79.0±11.6	6.16	0.001**
CVR scores	22.3±3.2	10.1±7.7	1.49	0.010**

SBP – Systolic blood pressure; DBP – Diastolic blood pressure; CVR – Cardiovascular risk; mmHg – Millimetre of mercury; ** Significant at *P*<0.01

Table 4: Relationship between age, anthropometric variables and cardiovascular risk score of retirees and controls

Variables	Correlation	
	Retirees	controls
Age (years)	−0.081	0.015
Height (meter)	0.02*	0.22**
Weight (kilogram)	0.47**	0.51**
BMI (kilogram/meter²)	0.33*	0.39**
WC (centimeter)	0.69	0.084

BMI – Body mass index; WC – Waist circumference; *Correlation is significant at *P*<0.05 level; **Correlation is significant at *P*<0.01 level (2- tailed)

Table 5: *t*-test comparison between retirees and control groups

Variables	Retirees mean (SD)	Controls mean (SD)	*t*-cal	*P* value
Age (years)	63.1±6.1	63.8±5.9	0.5	0.622
Height (m)	1.7±0.91	1.6±0.1	2.7	0.009**
Weight (kg)	74.1±10.7	73.5±10.5	0.3	0.74
SBP (mm Hg)	142.4±16.8	130.1±14.4	5.1	0.001**
DBP (mm Hg)	88.7±11.6	78.9±11.6	5.7	0.001**
WC (cm)	73.5±10.57	92.4±13.2	−13.1	0.005**
BMI (kg/m²)	26.5±4.58	27.1±4.0	−1.0	0.3
CVR	22.3±13.4	10.1±7.7	7.5	0.001**

**Significant at *P*<0.01 level, *significance at *P*<0.05. SBP – Systolic blood pressure; DBP – Diastolic blood pressure; BMI – Body mass index; WC – Waist circumference; CVR – CVD risk score

risk scores. This may be due to the sedentary lifestyle that is prevalent among retirees (reduction in the activities of most retirees) after disengaging from active public service unlike the age matched non-retiree that were more active in their employment as active lifestyle and exercise are some of the major ways to burn excess fat and bad cholesterol. Another factor that may be responsible for the higher risk of the retirees in this study is that most retirees in low income countries like Nigeria still undergo the challenges of caring for their dependents and engage in behavioural changes and activities out of boredom that further puts them at more CVD risk such as alcoholism. In this study, poor diet (25.78%) and lack regular exercise (22.15%), which is very common in retirement was also seen among the retirees; this could explain why 58% of the retirees were in the high and medium risk category unlike their age-matched non-retiree counterparts. This view has been supported by past studies,[9,12] which revealed that personality, social support and self efficacy are factors that jointly predict the general health status among retirees.

Gender analysis revealed a significant difference in the CVD risk factors scores between male and female retirees showed that the females had higher CVD risk scores. Though, this finding disagrees with previous findings which indicated that men are of higher risk of developing CVD than women.[17] However, it could be attributed to the men as men in most African societies are generally more active than women in physical and recreational activities that tends to reduce some CVD risk factor.

The female retirees were found to have higher mean values for SPB and DBP when compared with the male retirees, this, however, is in disagreement with the findings of Criag,[18] which stated that men have a slightly higher BP than women. The retirees were found to have a higher BP than the non-retirees. This was likely due to the higher prevalence of modifiable risk factors for BP (such as more active lifestyle) of non-retirees compared to the retirees as shown by similar past studies.[9,19,20]

CONCLUSION

The results of the study are for only retirees (subjects) who visited the pensioner secretariat upon invitation. The study concludes that retirees in Ile-Ife were at risk of developing CVD, had higher CVD risk factors than the control participants. Wrong diet, inactivity, high BP and over-weight were the major CVD risk factors recorded among the study participants. Female retirees had a significantly higher CVD risk compared to male retirees. Studies are needed to explain the differences in the body composition indices as well as CVD risk factors between the retirees and age-matched non-retirees in a semi urban city (like Ile-ife) in a low income country like Nigeria.

ACKNOWLEDGMENT

The authors wish to thank the executive committee members of the Obafemi Awolowo University and Obafemi Awolowo University Teaching Hospitals Retirees Association for their cooperation and assembling of the study participants during the process of data collection.

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How to cite this article: Ojo IA, Mohammed J. Anthropometry and cardiovascular disease risk factors among retirees and non-retirees in Ile-Ife, Nigeria: A comparative study. Niger Med J 2013;54:160-4.

Source of Support: Nil, **Conflict of Interest:** None declared.