

## Exercise, Overweight and Obesity in Rural Communities, the Situation of Some Communities in the Central Region of Ghana

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### Abstract

**Objective:** The study aimed at finding the level of physical activity and the evidence of overweight and obesity and associated its sociodemographic factors in some rural communities in the central region of Ghana.

**Subjects:** The study was a cross sectional survey involving a total of 470 respondents aged 18 to 91years (337 females and 133 males) in 7 rural communities in the Central Region of Ghana.

**Findings:** Our study found that 42.1% of respondents engaged in some form of physical exercise and that the exercise of choice was walking. The incidences of obesity and overweight were 3.1% and 13.0% respectively in male and 14.9% and 26.6% respectively in females. Significant associations were found between the Body Mass Index (BMI) of respondents and the following factors; regular participation in physical activity ( $p=0.032$ ), sex ( $<0.0001$ ) and educational level in female ( $p=0.033$ ). There were also significant associations between exercising and factors such as level of education ( $p<0.0001$ ) and sex ( $<0.0001$ ).

**Conclusion:** A number of sociodemographic factors were found to have association with the BMI and regular participation in physical activity. Our findings also seem to suggest an increasing trend in weight gain particularly in the female rural population.

### Introduction

Obesity and it related health risk has been considered as a problem of the developed world and economically affluent societies. In Ghana, anecdotal evidence has tagged obesity as the problem of the rich and urban societies.

Evidence of studies in some parts of the country have however produced growing evidence of its prevalence in both urban and rural societies Work by Amoah [1] found overweight and obesity prevalence of 23.4% and 14.1% respectively in urban and rural Accra. The last demographic and health survey reported that 40% of urban women and 20% of rural women are overweight.

Physical inactivity has been noted as one of the modifiable risk factors causing the rising global burden of chronic diseases [2].

Regular moderate intensity physical activity have been found to be beneficial in lowering risk of coronary heart disease and a variety of other chronic diseases including hypertension, non-insulin dependent diabetes (Type 2), colon cancer, osteoarthritis, and osteoporosis [3]. These health benefits appear to be greatest when individuals move from a completely sedentary lifestyle to introducing some amount of modest physical activity into their lives [3].

In Ghana, the Ministry of Health's recommendation for physical activity in adults is 30-60 minutes of moderate-intensity physical activity for 3 to 5 days of the week [4].

Even though there is a drive worldwide to help promote health through life style modifications especially through participation in physical activity there seems to be limited knowledge of the amount of physical activity performed in different populations worldwide [2].

Ghana like many developing countries has sparse data on physical activity levels and epidemiological information on overweight and obesity of its populace [5].

The study aimed at assessing the level of physical activity and the evidence of overweight and obesity in some rural communities and the

sociodemographic factors that are associated with overweight, obesity and physical activities.

### Methods and Materials

The study was a cross sectional survey involving a total of 470 of the estimated 600 respondents aged 18 to 91years (337 females and 133 males) in 7 rural communities in the Central Region of Ghana. The selected seven communities are designated sites for the Community Based Experiences Services (COBES) program of the University of Cape Coast, School of Medical Sciences. The communities which included Abakrampa, Moree, Saltpond, AssinPraso, AssinBreku and TwifoHemang and Jukwa were selected from 3 different districts within the Central Region of Ghana.

The study covered all adults aged 18 years and above who consented to be part of our study since they were small communities. At total response rate of 78.3% was realised in this study.

### Questionnaire

The questionnaire used for the study were pre-tested and then administered by trained interviewers in the field. The questionnaire

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elicited sociodemographic information including gender, age, education, and employment status. Questions in the general area of physical activity inquired about the participation in regular physical activity, these included deliberate health oriented actions such as walking, aerobics, jogging, bicycling, swimming, playing football etc. Respondents who indicated that they made a conscious effort to engage in at least 90 minutes of moderate-intensity aerobic exercise during the week, (not including daily physical activities) were deemed by the study to be engaging in regular exercise, even though they had not met the World Health Organisation's (WHO) recommendation of at least 150 minutes of moderate-intensity aerobic physical activity throughout the week [6].

### Anthropometric Measurements

The Body Mass Index (BMI) was obtained at the time of administration of the questionnaire by the trained interviewers. Measurements were taken with respondents wearing lightweight clothing without shoes using seca 755 column scales. Height (m) was measured with a height seca 224 telescopic measuring rod attached to the seca column scale to the nearest 0.01 cm with respondents standing upright following standard protocol. Weight was measured to the nearest 0.5 kg. BMI was calculated as weight (kg) divided by height squared (m<sup>2</sup>). The weights were categorized using the WHO standard as follows <18.5 kg/m<sup>2</sup> underweight, 18.5-24.9 kg/m<sup>2</sup> normal weight, 25.0-29.9 kg/m<sup>2</sup> overweight, and ≥ 30 kg/m<sup>2</sup> obese.

### Data analysis

Cross tabulations were drawn for various sociodemographic characteristics and BMI among the adult communities. The associations between BMI and the socio demographic variables were tested with chi-square analysis significant at p<0.05. The data was analysed using IBMSPSS version 19.0.

### Results

A total of 470 respondents were interviewed, 133 (28.3%) males and 337 (71.7%) females. The ages of respondents ranged from 18 to 91 years, with a mean age of 51.6 years SD ± 16.95. Two hundred and fifty (53.2%) respondents were married. With regards to education 293 (62.3%) respondents had some form of formal education (this ranged from those with at least primary level education, to those with tertiary level education). The majority of respondents (72.6%) engaged in occupations that required manual work. About 42.1% of respondents engaged in regular exercise. Table 1 shows the participation in exercise by gender while Table 2 shows the type of exercises that respondent engaged in. 73.8% of those who exercised regularly had some form of formal education (Table 3). The incidences of obesity and overweight were 3.1% and 13.0% respectively in male and 14.9% and 26.6% respectively in females as indicated in Tables 4 and 5.

Tables 6 and 7 show the distribution of BMI across gender and occupation of respondents respectively. Significant associations were found between the Body Mass Index (BMI) of respondents and the following factors; regular participation in physical activity (p=0.032), sex (<0.0001) and educational level in female (p=0.033). There were also significant associations between exercising and factors such as level of education (p<0.0001) and sex (<0.0001).

### Discussion

In our study, 42.1% of all respondents engaged in regular physical exercise. Within the sex distribution, 57.1% and 36.2% of males and

Gender	Had physical activity n (%)	P value
Male	76 (57.1)	
Female	122 (36.2)	
Total	198 (42.1)	<0.0001

Significant at p <0.05

**Table 1:** Participation in physical activity n=470.

Sex	Walking n(%)	Soccer n(%)	Skipping n(%)	Jogging n(%)	Cycling n(%)
Male	38 (29.5)	11(100.0)	1(7.7)	31(62.0)	6 (100.0)
Female	91 (70.5)	0 (0.0)	12 (92.3)	19(38.0)	0 (0.0)
Total	129 (61.7)	11 (5.2)	13 (6.2)	50 (23.9)	6 (2.9)

**Table 2:** Types of Physical Activity engaged in by Sex.

Education	Had physical activity	No physical activity	P value
No formal education			
	51 (26.2)	116 (43.8)	
Formal education	144(73.8)	149 (56.2)	
Total	195 (42.4)	265(57.6)	<0.0001

Significant at p <0.05

**Table 3:** Participation in Physical Activity by Education Level.

Sex	Underweight n(%)	Normal n(%)	Overweight n (%)	Obesen (%)	P value
Male	15 (11.5)	95 (72.5)	17 (13.0)	4 (3.1)	
Female	31 (9.3)	165 (49.3)	89 (26.6)	50 (14.9)	
Total	46(9.9)	260(55.8)	106(22.7)	54(11.6)	<0.0001

Significant at p <0.05

**Table 4:** BMI Distribution by Sex.

Physical Active	Underweight n(%)	Normal n(%)	Overweight n(%)	Obesen (%)	P value
Yes	15 (32.6)	125 (48.1)	36 (34.0)	20 (37.7)	
No	31 (67.4)	135 (51.9)	70 (66.0)	33 (62.3)	
Total	46 (100)	260 (100)	106 (100)	53 (100)	0.032

Significant at p <0.05

**Table 5:** BMI Distribution by Physical Exercise.

females respectively exercised regularly. These percentages represents individuals who participate in at least 60 minutes of physical exercise during the week and not necessarily those who meet the WHO's recommendation of at least 150 minutes per week [6]. Significant associations were found with sex and participation in exercise (p<0.0001). In a worldwide survey of physical activity involving 51 countries, Guthold et al. [2] found that with the exception of some Eastern European countries men, were more likely to be physically active than women. Though this study did not assess the reason(s) for the lower level of participation in exercise among women, research has shown that women reported more often the barriers for physical activities than men [7,8]. The involvement of women in multiple roles such as mother, wife, caregiver, employee, and volunteer significantly affects time to exercise [9]. Certain societies also do not look favourably on women engaging in physical activity [10].

The exercise of choice for both male and female respondents was walking this was followed by jogging, then football for males and skipping rope for females. Over 60% of respondents indicated that walking was the main form of exercise that they engaged in. Walking provides many health benefits including: increasing high-density

Sex	Education	Underweight n(%)	Normal n(%)	Overweight n(%)	Obese n(%)	P value
Male	No formal	15 (16.7)	4 (25.0)	2 (50.0)		
	0 (0.0)					
	Formal	15 (100.0)	75 (83.3)	12 (75.0)	2 (50.0)	
	Total	15 (12.0)	90 (72.0)	16 (12.8)	4 (4.2)	0.073
Female	No formal	80 (49.1)	35 (39.3)	14 (28.6)		
	17 (54.8)					
	Formal	14 (45.2)	83(50.9)	54 (60.7)	35 (71.4)	
	Total	31(9.3)	163 (49.1)	89 (26.8)	49 (14.8)	0.033
Total		46 (10.1)	253 (55.4)	105 (23.0)	53 (11.6)	0.788

Significant at  $p < 0.05$

**Table 6:** BMI Distribution by Sex and Level of Education.

Sex	Occupation	Underweight n(%)	Normal n(%)	Overweight	Obese	P value
Male	Manual	83 (87.4)	11 (64.7)	1 (25.0)		
	13(86.7)					
	Sedentary	2 (13.3)	12 (12.6)	6 (35.3)	3 (75.0)	
	Total	15 (11.5)	95 (72.5)	17 (13.0)	4 (3.1)	0.020
Female	Manual	118 (71.5)	59 (66.3)	34 (68.0)		
	19 (61.3)					
	Sedentary	12 (38.7)	47 (28.5)	30 (33.7)	16 (32.0)	
	Total	31 (9.3)	165 (49.3)	89 (26.6)	50 (14.9)	0.648
Total		46 (9.9)	260 (55.8)	106 (22.7)	54 (11.6)	0.071

Significant at  $p < 0.05$

**Table 7:** BMI Distribution by Gender and Type of Occupation.

lipoprotein, reducing blood pressure, helping to maintain weight loss and decreasing the risk of death from cardiovascular disease [3]. As a form of exercise walking has been found to be especially promising as a focus of public health intervention particularly among populations with a low prevalence of physical activity, because of its acceptability and accessibility [3].

There was a statistical significant association between having had formal education and participation in exercise ( $p < 0.0001$ ). Other researchers have also found a similar association [2,11].

Research has shown that there is a clear association between physical activity and an increase in the risk of weight gain [12-14]. Our study also found significant association between regular participation in physical exercise and the BMI of respondents ( $p = 0.032$ ).

According to the World Health Organisation's (WHO) Global Health Observatory (GHO) [15] data repository, in the year 2008, 30.4% of Ghanaians above the age of 20 years were overweight while 8.0% were obese. In our study the incidence of obesity was found to be 11.6% while being overweight was 22.7%. In 2005, Biritwum et al. [5] found the incidence of obesity and overweight in the Central region of Ghana to be 5.1% and 13.7%, respectively.

The GHO data repository puts the national incidence for obesity and overweight among males at 4.4% and 24.2% respectively. Our study found that 3.1% and 13.0% of males were obese and overweight respectively, suggesting a lower incidence than the national average. Our study recorded a higher incidence of obesity for women as compared to the figures of the GHO (14.9% to 11.7%), but a lower incidence of overweight (26.6% to 36.7%). The higher incidence of obesity is worrying and supports the fact that there may be an increasing trend in obesity even in rural Ghana particularly among women. Also of interest is the fact that the 26.6% incidence of overweight in women recorded is higher than the 20% recorded by the GDHS in 2008 [16]

for rural women, similarly suggesting an upward trend of weight gain in rural Ghanaian women. Our study found a significant association between sex and the BMI of respondents ( $< 0.0001$ ).

There was a significant association between having had some formal education and the BMI of female respondents ( $p = 0.033$ ) but there was no such association in the male population ( $p = 0.073$ ). This finding suggests that having gone to school may be a stronger determinant of weight gain in rural women. In the year 2000, Molarius et al. [17] using data from the WHO's Monitoring Trends and Determinants in Cardiovascular Disease (MONICA) project that stretched a 10 year period found that, in general, there was a trend toward an inverse association between BMI and educational level and that this association was stronger among women than men.

Within the male sex category, significant association was found between the type of occupation engaged in and the BMI of respondents ( $p = 0.020$ ). According to Hill and Melanson [18], the most likely environmental factor contributing to the current obesity epidemic is a continued decline in daily energy expenditure. This suggests the tendency to gain weight among males in rural Ghana may be influenced by the amount of energy that they expend daily at work.

## Conclusion

Our study found significant association's for BMI of respondents in the rural communities and some sociodemographic factors such as gender, level of education and type of occupation. The study also found significant association between BMI and regular physical exercise. Gender and educational level were also found to be associated with regular participation in exercise. Our findings seem to suggest an increasing trend in weight gain particularly in the female populace of the rural communities. Evidence from this study also suggests that walking may be generally accepted as a form of exercise particularly in rural areas. As such policy makers in Ghana should look into

developing and implementing programs at the community level, with a focus on encouraging inhabitant to engage in walking as a form of exercise.

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