Reported Physical Activity Levels And Equipment Use As Predictors Of Body Composition Of Members In Ghanaian Fitness Clubs

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ABSTRACT

The purpose of this study was to determine whether Ghanaian adults’ self-reported physical activity and exercise equipment use reflected their fitness levels in body composition as measured by Body Mass Index (BMI), Body Fat Percentage (BFP) and Waist-to-Hip Ratio (WHR) using the descriptive correlational study design. The population for the study was all the 40 registered Fitness Clubs in the Western Region of Ghana with an accessible population of 550 members. A total of Fifty-Five (55) respondents were randomly selected as the sample using the Proportionate Sampling by Size Technique. Data was collected through a researcher-designed Structured Questionnaire which was validated by three experts that elicited information from members on reported level of physical activity and equipment use. Standardized measurements of BMI, WHR and BFP were used to assess body composition. Inferential statistics of the Pearson Product Moment Correlation Co-efficient and Stepwise Regression analysis were employed to test three hypotheses that were generated at a significant level of 0.05. Findings of this study revealed that there were no significant relationship between body composition and reported physical activity and equipment use among apparently healthy Ghanaian adults in fitness clubs; also the independent variables were not significant predictors of body composition. Based on the findings it was recommended that physical fitness specialists should depend on reliable and objective recall measures than self-reports in assessing fitness parameters, again investigation into the effects of other factors like age, gender, dietary patterns that may predict body composition among adults should be the focus of future research.

Keywords: Apparently Healthy Adults; Body Composition; Health-related Physical Fitness Components; Obesity; Physical activity

1. INTRODUCTION

The concept of wellness focuses on lifestyle changes that include nutrition, physical activity, useful and satisfying work and recreation. Being physically active enables one to maintain a healthy body weight that helps to prevent obesity related health problems (Siedentop, 2007). Physical activity has been defined as any bodily movement undertaken by the skeletal muscles, requiring energy for its execution and for increasing energy expenditure beyond basal levels (Caspersen, Powell & Christenson, 1985; Haanstra & Kamper, 2011). Regular involvement in moderate to intense physical activity is seen as a necessary component of achieving and maintaining wellness (Blair & Connelly, 1996; Burton, Khan & Brown, 2011; Ratzlaff, 2012).

Physical activity is a key concept in public health and exercise because reduced physical activity is a well-known risk factor for many chronic diseases and disorders (Harkell, Lee, Pate, Powell, Blair, Franklin, Macera & Heath, 2007), with sedentary lifestyles becoming common around the world (WHO, 2004).
therefore necessary to use organized physical fitness programmes to improve the health benefits of physical activity.

Measurement of physical fitness is a common and appropriate practice in preventive and rehabilitative exercise programmes. The purpose of health-related fitness testing in such programmes include; educating participants about their present health-related fitness status relative to criterion-referenced standards, providing data that are helpful in the development of exercise prescriptions to address all fitness components, collecting baseline and follow-up data that allow evaluation of progress by exercise programme participants, motivating participants to establish reasonable and attainable fitness goals as well as stratifying cardiovascular risk (Meredith & Welk, 2007; ACSM, 2010). The health-related components of physical fitness have a strong relationship with good health and are characterized by an ability to perform daily activities with vigour, and demonstrate the traits and capacities associated with low risk of premature development of the hypokinetic diseases (Hewitt, 2007; ACSM, 2010; Perry, 2012).

Body composition defined as the body’s relative amount of fat-free mass (muscle, bone and water) to fat mass in the body (Fahey, Insel & Roth, 2005; Corbin & Welk, 2005) can be assessed using standardized field measurements like; body mass index (BMI), body fat percentage (BFP) using skinfolds and waist-to-hip ratio (WHR).

A combination of these field measurements is vital because the BMI has a higher standard error when applied alone to determine excess body fat. Again excess body fat centrally located at the midriff (android obesity) is related to high risk of hypokinetic diseases than excess fat located in the hips and thighs- gynoid obesity (Hewitt, 2007). Consequently, efforts to address health disparities related to obesity and its comorbidities should be emphasized.

Obesity, as defined by Mc Carron (2010) is excess body fat greater than 20% above ideal weight. It has become one of the most important public health challenges of our time. It has been predicted to replace cigarette smoking as the major killer of Americans and Africans this century (Grundy, 1998). Research shows that excess body weight directly leads to many health problems and often contributes indirectly to other serious disorders including Type II diabetes, coronary heart disease, high blood pressure, hyperlipidemia, various cancers, osteoarthritis, gallbladder disease, stroke, and all -cause mortality. It is also observed that obese individuals also have a diminished quality of life. This is demonstrated by reduced self-esteem, negative dispositions including discrimination by others and a self-perceived reduction in overall quality of life (Peterson & Tucker, 2008).

Consequently, fitness testing, measurement, and evaluation all serve an important purpose of providing accurate and relevant information that allow us to make the most effective fitness choices. The information received through simple field tests is often enough to determine whether one’s physical condition is consistent
with good health and can help one plan an appropriate programme to maintain or improve one’s current levels of fitness. It is important therefore to find out if members in Ghanaian Fitness Clubs are benefiting from active participation in physical activity in relation to their body composition and its effects on their overall health and well-being.

1.1 STATEMENT OF THE PROBLEM

The impact of physical activity on body composition over time has not been examined well and remains elusive. Dipietro (1995) in a review reported that data on how physical activity affects the risk or development of weight gain or over-weight in general populations are too few. Self-report data collection is one of the most common forms of population-level Physical activity measurement (Katzmarzyk & Tremblay, 2007). Levy and Ready (2009), and Ridley, Olds and Hills (2006) reported that, self-reports typically demonstrate moderate to low validity when used in child and adolescent populations due to over reporting (Eisenmann, 2003). However, there is little or no scientific evidence to prove that self-reported physical activity as well as the availability and use of exercise equipment could be good predictors of body composition in adults needed for health risk factor stratification.

Therefore, there is the need to establish if the reported physical activity levels and equipment use could predict body composition which is a health risk indicator for obesity related problems in the adult population of Ghana. The purpose of this study was to determine whether self-reported physical activity levels as well as equipment use reflected levels of fitness among apparently healthy adults in reference to body composition.

1.2 RESEARCH QUESTIONS

The study sought to find answers to the following questions:

- What are the levels of physical activity indices (PAI) of members in the various fitness Clubs in Ghana?
- Is there any relationship between reported PAI and body composition Health index of Ghanaian fitness club members?
- Is there any relationship between availability and use of exercise equipment and body composition Health index of Ghanaian fitness clubs members?
- What is the strength of association between the body composition levels of members in Ghanaian fitness clubs and their reported levels of physical activity indices and equipment use?

1.3 HYPOTHESES

These hypotheses were formulated and tested in the study:

- There is no significant relationship between body composition of members and their reported physical activity index.
There is no significant relationship between body composition levels of members and the availability and use of exercise equipment in Ghanaian fitness clubs.

Physical activity index and use of exercise equipment will not be significant predictors of healthy body composition.

2. METHODOLOGY

The descriptive correlational study was employed for the study, to measure the variables as they existed naturally, with the sole aim to establish any existing relationships between or among the variables (Bordens & Abbot, 2002; Fraenkel & Wallen, 2000). According to Dunn (2001), a correlational study is used to discover predictive relationships and the degree of association among variables.

The population for the study was made up of all the (40) forty registered Keep-Fit Clubs in the Western Region of Ghana. A total of 55 members were selected randomly from the four sampled clubs (Aerobic Keep-fit club-14, Stadium keep-fit club-15; Sekondi Keep-fit club -15; and Takoradi Keep-fit club-11) using the proportionate sampling by size technique (PSST) on the assumption that 10 percent of an accessible population is representative enough for a study (Dunn, 2001).

Descriptive statistics were used to analyze demographic data while inferential statistics of the Pearson Product Moment Correlation Co-efficient was used to test the hypotheses 1 and 2. To determine the predictive capacity of variables, the stepwise multiple regression analysis was also used at a significance alpha level of $p < 0.05$ for hypothesis 3. The SPSS version 20 was the package used for the analysis. The demographic variables measured were; age in complete years, gender, height in centimeters, and weight in kilograms. The measuring instruments and tests used were as follows: Bathroom measuring scale (Beurer 46) with a maximum weight of 150 kg for measuring weight; Sun steel measuring tape made in Germany for measuring height; A non-elastic tape for measuring body girths; and Accu Measure Fitness 3000 calipers for measuring skinfold.

A researcher-designed questionnaire with three sections was used to elicit information on members’ Reported Physical Activity levels and availability and use of exercise equipment. Section ‘A’ assessed demographic data and body composition measures. Section ‘B’ elicited information on members’ physical activity index with a five-point Likert-type scale of “never or almost never”, “occasionally”, “often”, “very often” and “always or almost always”.

The highest score in Section B was 25 whilst the lowest score was 5. The range was 20 and the median 10. To determine the extent of practicality of the variable physical activity index to the respondents, cut-off points
with respective descriptions were designated as follows: (a) 1-5: sedentary; (b) 6-10: lightly active; (c) 11-15: moderately active; (d) 16-20: very active and (e) 21-25: extremely active.

For section C members were required to respond appropriately to a four-point Likert-type scale of “strongly agree (SA), Agreed (A), Disagree (D) and Strongly Disagree (SD)”. Section C had 20 as the highest score with 5 as the lowest. The availability and use of exercise equipment was designated with the following cut-off points: (a) 1-5: no equipment; (b) 6-10: not well-equipped; (c) 11-15: well-equipped and (d) 16-20: very well equipped.

Body composition was assessed using three different methods; body mass index (BMI), Waist-to –hip ratio (WHR) and Body fat percentage (BFP) using skinfolds. Each measure was categorized into three levels with 1, 2 and 3 representing each level. The three measures were aggregated and scored using these cut off points; 1-3 very healthy, 4-6 somewhat healthy and 7-9 not healthy.

3. RESULTS

Table 1: Frequency Distribution of Members by Age and Gender

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>14</td>
<td>25.5</td>
</tr>
<tr>
<td>30-39</td>
<td>15</td>
<td>27.3</td>
</tr>
<tr>
<td>40-49</td>
<td>19</td>
<td>34.5</td>
</tr>
<tr>
<td>50-59</td>
<td>7</td>
<td>12.7</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>81.8</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Table 1 above shows that individuals from 60 years and above were not involved in physical activity and exercise training in all the fitness clubs. There were also few females (18.2%) as compared to males (81.8%)

Table 2: Table Showing the Frequency Distribution of Physical Activity Index (PAI), State of Exercise Equipment (SEE) and Aggregated Body Composition Scores (ABCS) of Members

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lightly active</td>
<td>3</td>
<td>5.5</td>
</tr>
<tr>
<td>Moderately active</td>
<td>17</td>
<td>30.9</td>
</tr>
<tr>
<td>Very active</td>
<td>30</td>
<td>54.5</td>
</tr>
<tr>
<td>Extremely active</td>
<td>5</td>
<td>9.9</td>
</tr>
<tr>
<td>SEE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No equipment</td>
<td>13</td>
<td>23.6</td>
</tr>
<tr>
<td>Not well equipped</td>
<td>27</td>
<td>49.1</td>
</tr>
<tr>
<td>Well -equipped</td>
<td>14</td>
<td>25.5</td>
</tr>
<tr>
<td>Very well equipped</td>
<td>1</td>
<td>1.8</td>
</tr>
</tbody>
</table>
ABCS
Very healthy 7 12.7
Somewhat healthy 40 72.7
Not health 8 14.6
N 55

In Table 2 above, more than half (63.6%) of the members reported high levels of physical activity. The results showed that majority of the clubs (72.7%) had little or no exercise equipment. On the fitness levels of the members the measurements revealed that only 12.7% had the level of body composition needed to maintain health and well-being. Majority of the respondents (87.3%) were in the need for improvement zone (NIZ).

Table 3: Correlation ‘r’ Between Body Composition of Members and their Reported Physical Activity Index and the Availability and Use of Exercise Equipment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Physical Activity Index</th>
<th>Availability and Use of Exercise Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body composition</td>
<td>Pearson Correlation ‘r’</td>
<td>.179</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.191</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>55</td>
</tr>
</tbody>
</table>

3.1 CORRELATION IS SIGNIFICANT AT THE 0.05 LEVEL (2-TAILED)

Table 3 above shows that body composition has a weak and negative relationship with PAI (-.179), while having a positive and weak relationship with availability and use of exercise machines (.044).

Table 4: Regression Analysis for Physical Activity Index, Equipment Use and Body Composition Among Members in Ghanaian Fitness Clubs

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.188*</td>
<td>.035</td>
<td>-.002</td>
<td>.52723</td>
</tr>
</tbody>
</table>

Predictors: (Constant), availability and use of machines, physical activity index

From table 4 above, only 3.5% of the aggregated body composition score can be predicted by physical activity index and equipment use alone (R square of 0.035) which means other factors play a much bigger role than the selected independent variables.

4. DISCUSSION

The results from table 1 indicated that only people age 18-59 years are involved in physical activity. The study has therefore supported the conclusion that individuals from 60 years and above have high levels of Cardiovascular Disease risk due to their less active participation in physical activity (Colbert, 2007).

Table two indicated that most of the members were highly active in physical activity participation. Their highly level activity does not relate strongly with their levels of body composition. Consequently, the study
has also agreed with the assertion that being active as indicated by the majority of the members (63.6%) does not guarantee improvement in fitness levels if the right mixes of duration, intensity and variety of exercise prescription for preventive and rehabilitative programmes are not adhered to (Pasternak, 2004).

The results from table 3 showed that reported physical activity levels had a weak and inverse relationship (-0.179) with body composition of members in Ghanaian fitness clubs. The significant (2-Tailed) value of .191 is greater than .05 and therefore suggests that there is no statistically significant correlation between reported physical activity levels and body composition making the null hypothesis 1 accepted. The finding supports those of Tucker and Peterson (2003), le Coq et al (2008), who found an inverse relationship between reported physical activity and adiposity, as well as a weak relationship with reported physical activity and body composition measures in youth and adolescent studies. This they attributed to over-reporting of physical activity levels. Consequently, the finding is in contrast with those of Belton and Mac Donncha (2010) which showed a positive and strong correlation between reported physical activity levels and body composition. The difference could be attributed to mode of instruction and quality of programme.

Table 3 also indicated that availability and use of exercise equipment had a positive and weak relationship (0.044) with body composition of members in Ghanaian fitness Clubs. However, the significant (2-Tailed) value of .750 is greater than .05 and therefore suggests that there is no statistically significant relationship between equipment use and body composition making the null hypothesis 2 also accepted. The finding is in contrast to those of Arnhein (2000), Peter (2001), Obiyemi, Adesoye and Ogunsanwo (2002) that the availability and use of exercise facilities and equipment facilitates instruction, enhances skill acquisition, encourage mass participation and improve fitness and health of participants in physical activity programmes. However, the intensity and correct use of the facilities and equipment will determine the level of fitness benefits accrued.

Table 4 indicated that reported physical activity levels and equipment use are not good predictors of body composition (3.5%). The finding is in conformity with that of Peterson and Tucker (2008) which concluded that baseline physical activity levels and equipment use were not predictive of changes in body fat among middle-age women. This implies that individuals may have equipment or be accessible to equipment or exercise machines but may not take advantage of using these machines optimally to enhance their health and fitness levels. This might be that most physical fitness instructors do not have the requisite qualification, experience and the human relation knowledge needed to provide their members with the appropriate usage of exercise machines to improve fitness levels required basically for health development and well-being.
5. CONCLUSIONS

This study clearly reported that, individuals between the ages 60-64 were not involved in physical activity and reported physical activity levels and the availability and use of exercise equipment were not significant predictors of body composition among active participants in Ghanaian fitness Clubs.

6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- Individuals between the ages of 60-64 seen as part of the adult population should be encouraged to be physically active.
- Physical fitness specialists should depend on reliable and objective recall measures than self-reports in assessing physical fitness parameters.
- Investigation into the effects of other factors like age, gender, dietary patterns that influence physical activity levels and may predict body composition among apparently healthy adults should be the focus of future research.

7. REFERENCES


Perry, M. (2012). What is physical fitness; Retrieved from www.buillean.com/2012/02/12/physical-fitness/


