STATUS OF PARTICIPATION IN PHYSICAL ACTIVITY AMONG DAY HIGH SCHOOL STUDENTS IN KAMPALA, UGANDA

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ABSTRACT

The study examined the status of participation in physical activity (PA) by 13-18 years old high school students attending day schools in Kampala District and the influence of age and gender on participation in PA. This cross-sectional analytical study involved male and female students (n=500) aged 13-18 years from selected day high schools who answered the International Physical Activity Questionnaire-Short Form (IPAQ-SF) which was used to measure and categorise PA into three levels; inactive, minimally active and HEPA-active. Descriptive statistics of frequency distributions, and percentages were computed for the demographic factors and participation in PA. Chi-Square analysis was used to determine the relationship between age and gender and participation in PA. Statistical analyses were conducted using SPSS Version 20. A p-value of less than 0.05 was considered as significant. Overall, 110 (22%) students were categorised as inactive, 231(46.2%) were minimally active and 159 (31.8%) were HEPA-active. A chi-square analysis showed that age (x^2=21.437, p=0.018) and gender (x^2=32.590, p<0.001) were significantly related to participation in PA. It was concluded that majority of the students aged 13-18 years were participating in minimal PA and that gender had an influence on participation in PA.
Keywords: Physical activity, status, high school students.

1. INTRODUCTION

Physical activity (PA) refers to any bodily movement produced by skeletal muscles that require energy expenditure (World Health Organisation, 2014). Participation in regular PA produces multiple physical and mental health benefits. For children and young people, regular participation in PA builds healthy bones and muscles, decreases the likelihood of obesity and disease risk factors such as high blood pressure, reduces anxiety and depression and promotes positive mental health (Center for Disease Control and Prevention, 2013). In 2018, the US Department of Health and Human Services reviewed and published guidelines for ensuring that young people are provided with opportunities to participate in physical activities that are appropriate for their age, enjoyable, and that offer variety.

The guidelines provide that; children and adolescents aged 6 to 17 years should engage in 60 minutes (1 hour) or more of moderate-to-vigorous physical activity daily. Within the 60 minutes of exercise, the guideline directs that most of the time per day should be either moderate or vigorous intensity aerobic PA and should include vigorous-intensity PA at least 3 days a week. In addition, muscle strengthening activities should be included within the 60 minutes on at least 3 days a week as well as bone strengthening exercises on at least 3 days a week.

Although realizing these guidelines is a minimum requirement to attainment of good health and body weight, 80% of 13-15 year old people were not meeting these PA recommendations worldwide (Hallal et al., 2012). In the US, studies have reported that less than a quarter (24%) of the children aged 6-7 years participate in 60 minutes of PA every day (CDC, 2013). A study conducted by Laura et al., (2017) indicated that only 26.1% of high school students participated in at least 60 minutes per day of PA on all 7 days of the previous week while 51.1% participated in muscle strengthening exercises on 3 or more days during the previous week.

In spite of the health benefits accrued from participation in PA, authors such as Joubert et al., (2007) and Peltzer, (2009) have indicated a decline in time spent in PA and an increase in sedentary behaviour amongst the young people in Africa with trends being higher in females and those living in urban settings. Guthold, Cowan, Autenrieth, Kann, and Riley (2010) affirmed that close to three quarters of young people in Africa fail to achieve the PA recommendations of 60 minutes a day for a minimum of five days in

a week. Peltzer, (2009) reported that in African countries such as Namibia and Zimbabwe, less than 50% of adolescents between 13 and 15 years of age were meeting the PA guidelines.

A few studies have been done in Sub-Saharan Africa examining the status and level of participation in PA among populations. For example, in Kenya, Ojiambo et al., (2012) compared habitual PA and sedentary time among adolescents aged 13 years from rural and urban areas of Kenya. The study concluded that rural Kenyan adolescents were significantly more physically active and less sedentary compared to urban adolescents. Although some measures on PA have been done in Uganda, there is lack of recent data on young people's status of participation in PA since repeated measures within time are rare. For instance, in 2003, the Global School-based Health Survey (GSHS) measured, among other health behaviours, the PA of urban students aged 13-15 years and found that only 17.7% of students were physically active for a total of at least 60 minutes per day (WHO, 2003). However; the survey did not provide detailed information on the types of activity: vigorous, moderate or walking, neither the levels: low, medium or high, in which the students were participating in.

Participation in PA seems to be influenced by gender and age of the individual. In a review of studies among adolescents aged 13-18 years by Sallis, Prochaska, and Taylor (2000), the most consistent finding was that boys were more active than girls. In a sample of Filipino youth, it was found that 87% of females reported no vigorous activities compared to 18% of males (Tudor-Locke, Ainsworth, Adair, & Popkin, 2003). Butt, Weinberg, Breckon, and Claytor, (2011) examined high school students aged 13-16 years and found that participation in PA decreased in the older females. This lead to the quest to understand if gender and age would affect participation in PA in a Ugandan context.

The Purpose of the study was to assess the status of participation in PA by high school students in Kampala, Uganda and to investigate the relationship between age & gender and participation in PA by high school students aged 13-18 years in Kampala District in Uganda. The study sought to provide the current status of participation in PA among high school students in Kampala, Uganda. The findings from this research are significant as they may be added to the surveillance data for Uganda and Africa at large which is necessary for monitoring trends in PA and health behaviour of different populations. The findings of this study are also important in promoting the understanding of factors that may influence student participation in PA and thus spearheading development of targeted school-based PA activity promotion programmes.

2. METHODS AND MATERIALS

2.1 Research Design

The study adopted a cross-sectional analytical design to determine the status of participation in PA against age and gender of the participants.

2.2 Study Variables

The independent variables were age and gender, while the dependent variable was participation in PA which was categorized into three levels; Inactive, Minimally Active and HEPA-Active (Health Enhancing Physical Activity) (IPAQ, 2004).

2.3 Study Area

The study was conducted in Kampala which is one of the districts in Uganda and the capital city of the country. Situated approximately 45km north of the Equator, the district is divided into 5 administrative divisions, namely: Central, Nakawa, Makindye, Kawempe and Rubaga Division (City Council of Kampala, 2008). Kampala district was purposively selected since it is highly urbanized compared to other districts in the country, attracting people from diverse backgrounds and standards of living. Furthermore, Kampala captures young people of varying lifestyles, opportunities to PA and physical environmental exposure. The study was conducted among students from randomly selected day high schools from each of the five divisions to ensure regional representation.

2.4 Target Population

The study targeted a population of both male and female students aged 13 to 18 years who were sampled from day high schools. According to the Ministry of Education, Science, Technology and Sports (MoESTS) in Uganda, an estimated population of 77,838 students attended high school education within Kampala (MoESTS, 2014).

2.5 Inclusion Criteria

The study included assenting male and female students aged 13 to 18 years attending day high schools and living within Kampala district and excluded those students who lived outside Kampala District and those who had lived in Kampala for less than 12 months. The study also excluded those students who had any condition that inhibited habitual participation in PA or could have experienced any circumstance such as an illness that prevented them from participating in PA either at home or at school for the last 7 days as of the time of data collection.

2.6 Sample Size

The sample size was calculated using the Fisher's formula as presented in Mugenda and Mugenda, (1999) as follows:

$$n = (z^2pq \times 1) \, d^2$$

Where; n = the desired sample size (if the target population is greater than 10,000)

z = the standard normal deviate at the required confidence level.

p = the proportion in the population estimated to have characteristics being measured.

q = 1-p. (p and q are the population proportions set to 0.5 if unknown).

d = the level of statistical significance set.

$$n = (1.96^2 \times 0.5 \times 0.5 \times 1) \, 0.05^2 = 384.16 \approx 400$$

The study aimed at involving five day schools from each of the five divisions of Kampala district making a total of 25 schools out of 248 schools. The sample size was increased by 20% of the calculated sample size to take care of students who may have failed to complete the study for one reason or the other. This set the sample size at 480 students. To get the number of students to be selected in each school, the total sample size was divided by the number of selected schools (480/25=19.2) implying that 20 students would represent each school bringing the sample to a total of 500 students.

2.7 Sampling Procedure

Each division provided the sampling frame. Multi-stage sampling procedure was used to sample schools in each division. All the schools in the sampling frame were subjected to simple random sampling. Five day high schools were randomly selected from each division. Each selected school that agreed to participate in the study was to provide 20 randomly selected students who fulfilled the eligibility criteria. This meant that each division was represented by 100 students. However, in the case of a low response rate from a school, another school within a division was randomly selected. This was done in order to achieve the desired sample size of 500 students.

2.8 Research Instruments

The IPAQ-SF was used to measure participation in PA. The questionnaire was used to estimate moderate and vigorous intensity activities and walking in terms of frequency (days/week) and duration (minutes/day) of each activity category in the last 7 days (Craig et al., 2003).

Students were asked the number of days they engaged in vigorous PA, moderate PA and walking, as well as the number of hours and minutes per day they did the three kinds of activities in the last 7 days respectively. Total minutes/week for vigorous intensity PA, moderate intensity PA and walking were calculated. A MET-minutes was derived by multiplying the respective total minutes with the metabolic equivalent of task (MET) value of vigorous PA (MET = 8.0), moderate PA (MET = 4.0) and walking (MET = 3.3), and then adding the three to give a total activity score in MET-minutes per week according to the IPAQ-SF guidelines.

Participation in PA was expressed in the following categories; (1) Inactive (2) minimally active and (3) HEPA active. A participant was categorised as inactive if he/she did not meet criteria for category 2 and 3. A participant was categorised as minimally active if he/she reported 3 or more days of vigorous activity of at least 20 minutes per day or 5 or more days of moderate intensity or walking of at least 30 minutes per day. The IPAQ-SF scoring guidelines (IPAQ, 2004) state that this category is more than the minimum level of activity recommended by the public health recommendations, but not enough for total PA when all domains are considered. To be categorised as HEPA active, a participant would have reported more than 3 days of vigorous activity accumulating more than 1500 MET-minutes or more than 5 days of walking plus moderate intensity activity and a sum of 3000 MET-minutes or more. According to the scoring guidelines (IPAQ, 2004) this category refers to those who exceed the minimum public health PA recommendations.

2.9 Data Collection Procedures

Data collection took place during the second school term of 2015 academic year. After seeking and receiving permission and consent from the parents through the school administration, arrangements were made with a given teacher to randomly select and group 20 sampled students for data collection. The students were given a package containing the assent form and questionnaire. Students who agreed to participate in the study signed the assent form and proceeded to fill the questionnaire. Each question was read to the students and explanation was given where required for clarity. Students were assured of confidentiality.

2.10 Pre-Testing

Pretesting of the questionnaire was done in order to familiarize research assistants with the research procedures in preparation for the actual study. Two research assistants with a Bachelor's Degree and good command of the English language were trained for data collection. Pre-testing was conducted among 15 students from a high school that was not sampled for the actual data collection. The pre-test gave an estimate of the feasibility, logistics and length of time required for data collection. The pre-test revealed that respondents needed a minimum of 45 minutes to complete the questionnaire under guidance.

2.11 Reliability and Validity

The IPAQ-SF, has been shown to have acceptable reliability coefficients ($r= 0.7$-0.97) and criterion validity ($r= 0.23$) when compared with accelerometer monitoring (Craig et al., 2003).

2.12 Data Analysis and Presentation

Physical activity data was cleaned and edited in excel spread sheet using the IPAQ-SF guidelines (IPAQ, 2004). To limit unrealistic high values, the physical activity scores were truncated to a maximum of 180 minutes per day in the different intensity levels.
Descriptive statistics were used to summarize the demographic characteristics of all participants in form of frequencies and percentages. Chi-square statistic, run by SPSS version 20, was used to establish the relationship between age and gender and PA levels of the students. Significance was tested at 0.05 level.

2.13 Logistical and Ethical Considerations

Ethical clearance was provided by the Kenyatta University Ethics Review Committee. Permission to have access and conduct the study within the high schools was sought from the Ministry of Education, Science, Technology and Sports in Uganda. Permission was also obtained from the head-teachers and parents of the students in the sampled schools to include the students in the study. An assent form was also signed by the students before they could fill in the questionnaires. The purpose of the study was clearly explained to the authorities and students. The students were assured of confidentiality of the information and provided with the right to withdraw from the study at any time.

3. RESULTS

Table 1: Demographic Information of responding students (N- 500)

Age group	n	%
13 years	24	4.8
14 years	38	7.6
15 years	89	17.8
16 years	95	19.0
17 years	118	23.6
18 years	136	27.2
Gender		
Male	237	47.4
Female	263	52.6

Data was collected from five hundred (n=500) day high school students (52.6% females). As illustrated in Table 1, students were grouped into 6 age categories (13, 14, 15, 16, 17, and 18 years of age). Majority of

the students were aged 18 years (27.2%). The total sample had a mean age of 16.3 years (SD =1.47) and a median age of 17 years.

Figure 1: Overall status of participation in physical activity
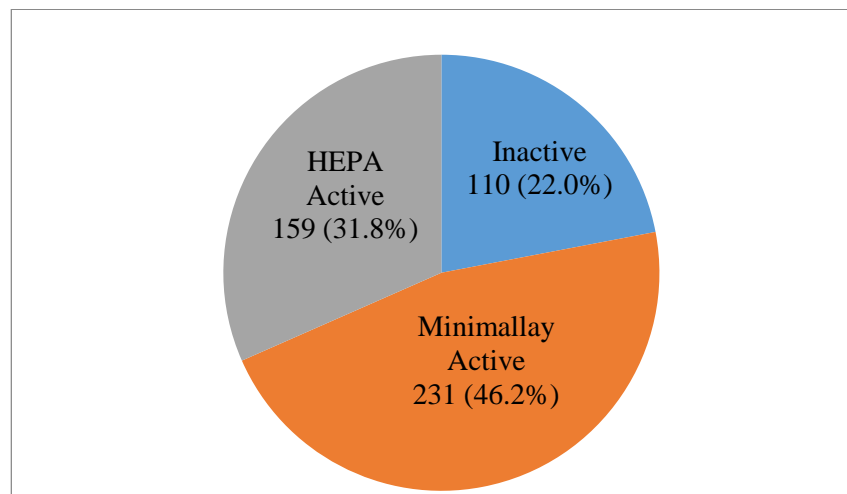
Participation in PA was expressed as inactive, minimally active or HEPA-active according to the IPAQ-SF guidelines (2004). The scores indicated that 22.0% were inactive, 46.2% were minimally active while 31.8% were HEPA-active.

Table 2: Level of participation in physical activity by age and gender

Variable	Inactive		Minimally Active		HEPA Active		X^2	p- value
	N	%	n	%	N	%		
Age group							21.437	**0.018**
13 years	7	29.2	11	45.8	6	25.0		
14 years	14	36.8	17	44.7	7	18.4		
15 years	21	23.6	34	38.2	34	38.2		
16 years	17	17.9	39	41.1	39	41.1		
17 years	31	26.3	53	44.9	34	28.8		
18 years	20	14.7	77	56.6	39	28.7		
Gender							32.590	**<0.001**
Males	44	18.6	88	37.1	105	44.3		
Females	66	25.1	143	54.4	54	20.5		

Note: Figures in bold indicate a significant relationship at p<0.05

Table 2 shows the distribution of the students into the PA levels according to the age and gender. A chi-square analysis showed that age (x^2=21.437, p=0.018) and gender (x^2=32.590, p<0.001) were significantly related to PA levels. Therefore, the null hypothesis that there is no significant relationship between age & gender and participation in PA was rejected.

4. DISCUSSION

4.1 Status of Participation in Physical Activity:

There is a notable (31.8%) participation in PA by the day high school students in Kampala Uganda. These students are attaining the health enhancing PA levels which resonate to the CDC 2018 PA guidelines for children aged 6 to 17 years. Although majority (46.2%) of the students are participating in PA, they do not get to attain the recommended levels for them to be classified as active thus they have been classified as minimally active. Twenty-two percent (22%) of the students are inactive as determined by the IPAQ-SF physical activity categories thus also not meeting the CDC 2018 PA recommendations for this age group.

However, the findings from this present study don't seem to agree with others conducted in Uganda and other areas of SSA within the same population. For example, the Global School-based Health Survey of 2003 reported that only 17.7% of the students were involved in PA. The possible reason for disagreement could be attributed to the time lapse from 2003 to date which has seen major transitions in PA among young people aged 13-18 years in Kampala. If this was to be the case, then this would be the

desirable direction in the PA transition as proposed by Popkin, (2006) in the 5th stage of the transition-behaviour change which is characterised by the desire to prevent or delay NCDs and prolong health, thus people engage in recommended PA practices.

Elsewhere in SSA, Asare & Danquah (2015) reported that of the participating Ghanaian youth school students, nearly half (44.3%) had low PA. Results from South Africa's 2014 report card (Draper, Basset, De Villiers and Lambert, 2014) on PA for children and youth revealed that more than half of the children and youth aged 6-18 years were not meeting the recommended PA levels. However, Brown, Trost, Bauman, Murry and Owen (2004) warn that comparison to other studies should be made with caution given the tendency for PA to be overestimated through self-report.

4.2 Association between Age Gender and Participation in Physical Activity

From the Chi-Square analysis, it was observed that age and gender was significantly related to participation in PA. Being of the female gender significantly increased the likelihood of being either inactive or minimally active. These results are consistent with findings from other studies which found a significant association between gender and participation in PA with the females exhibiting less participation. For example, Asare and Danquash (2015) reported that more females were inactive compared to the male students in Ghana. A systematic review by Muthuri et al., (2014) and another by Aura, Sormunen and Tossavainen (2015) concluded that males were more active than females. As argued by Doku, Koivusilta, Raisamo and Rimpela (2011) females perceive sports activities as masculine thus being disincentive to participation which could be a possible explanation for the findings of this present study. These results highlight a need to create more strategies that can promote participation in health enhancing physical activity especially among the females.

5. CONCLUSION

The findings of the study conclude that majority of students participate in minimal physical activity and that gender has an influence on participation in PA among the high school students. The results highlight the need for continued monitoring and evaluation of the PA behaviours among young people. This will help in the planning of interventions that can increase the likelihood of participating in PA especially among the females, in turn; this behaviour could be carried on to adulthood.

Future studies should incorporate objective and subjective measures of assessing physical activity in the different domains, that is, school, leisure and transport related physical activity.

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