



Assessment of Physical Activity Practices among Secondary School Students in Kakamega County, Kenya

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Abstract

Introduction: Physical activity is the bodily movement that involves the skeletal muscles, and it is beneficial in human development and growth. Lack of physical activity may indirectly expose one to certain health ailments, such as non-communicable diseases, which may lead to death. Secondary school students are among the 81% of children who do not meet the recommendation for moderate to vigorous physical activity (MVPA) levels. This study aimed to assess physical activity practices among secondary school students in Kakamega County.

Methods: A Descriptive survey was used with a sample size of 412 students aged 14 to 18 years. The data was collected using a structured questionnaire in line with the study aim, then coded and analysed using the Statistical Package for Social Sciences (SPSS 25.0).

Results: There were more males, 194 (47.1%), compared to females, 218 (52.9%), and most of the students were in the second form, 176 (42.7%), most of whom, 110 (26.7%), were 17 years of age. The majority, 54.1% participated in physical activity, with 104 (25.2%) engaging in it 3-4 times per week. There were no significant differences ($t(438) = -0.338, p=0.734$) between scores for males ($M=2.17, SD=0.690$) and females ($M=2.23, SD=0.728$). With a mean difference of $r=0.054$, 95% CI: -0.188 to 0.081).

Conclusion and recommendation: The majority of the students participated in physical activity, with most of them participating in ball games. Consequently, there is a need for more awareness and advocacy to promote physical activity practices among secondary school students.

Keywords: *Practices, Physical activity participation, Kakamega*

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Introduction

Physical activity is the bodily movement that involves the skeletal muscles (1;2). Physical activity helps in human development and growth, including among school-going children; conversely, inadequate physical activity (PA) may indirectly expose one to certain ailments such as non-communicable diseases leading to death (3;4;5). Per recommendations, Students should do at least 60 minutes of

moderate to vigorous physical activity to keep their health in check (6); however, a number of them do not meet the requirements.

Inadequate physical activity is associated with about two million deaths annually, which occur as a result of non-communicable diseases such as diabetes, hypertension and other cardiovascular diseases (7). Despite this, 81% of teenagers across the globe are physically inactive, with many leading a sedentary lifestyle, mostly engaging in screen time when out of school hours



(6). In Brazil, 97% of students engaged in PA, mostly during physical education (PE) classes at school. However, only 29% of students reached the recommended PA level, despite established guidelines and well-known benefits (8). Similarly, among Chinese children and adolescents, low compliance with recommended PA (9); however, this study did not exclusively focus on school-going children, which suggests a need for a study targeting this demographic. A different study, multi-country analysis, indicated that an insufficient number of students across 23 African countries met the recommended PA levels (10). Furthermore, Only 25% of male adolescents and 16% of female adolescents achieved the recommended physical activity levels, with the lowest participation in Sudan (11.6%) and the highest in Benin (38.3%) (10). The low prevalence of sufficient PA and high sedentariness across these countries calls for immediate interventions and further research on rural setups, as well as in Africa, to determine their level of PA activity.

Similar trends were observed in Kenya, with less than 12% of children meeting the daily recommended 60 minutes of PA. The researchers also noted that active transportation was used by more than 72% of Kenyan youths and children to commute to school. Although a good number of children and youths had a typical weight, they ought to ensure that the WHO recommendations on PA are met and maintained. Furthermore, the researchers also suggested further studies across various environments for a better representation of both the urban and peri-urban Kenyan population (11:12). These findings highlight a gap in physical activity participation. While the importance of PA is widely recognised and promoted, compliance with recommended PA levels remains worryingly low among secondary school students. Hence, there is a need for research to address the gaps. Therefore, this study aimed to fill these identified gaps by exploring practices of physical activity participation among

secondary school students in Kakamega County.

Methodology

Study site

This study was conducted in Kakamega County in Kenya. The County comprises 12 Sub-counties, 60 wards, 187 village units and 400 community areas (13). Additionally, the County has various schools that have dominated secondary school games at the National and East African level, nurturing talents who join professional sports, making Kakamega an ideal study location. Lurambi Sub-county, one of the 12 sub-counties in Kakamega County, is relatively cosmopolitan, encompassing both urban and peri-urban areas with diverse races, ethnic backgrounds, religions, and socio-economic groups.

Study design and population

This study employed a descriptive survey design. The study involved public secondary school students aged 14-18 years, both male and female, who were currently attending school in Kakamega County and had been enrolled for more than six months.

Students whose parents or guardians did not provide consent for participation were excluded. Additionally, students who were ill and those with a history of chronic conditions were excluded.

Sampling

Kakamega County was purposively selected due to their outstanding performance in sports. Lurambi sub-county was also purposively selected due to its cosmopolitan nature, capturing different ethnic backgrounds, religions, races, and people from different social and economic classes. The wards were selected via random sampling using a random number generator. In the next stage of sampling, the Secondary schools were purposively selected from the selected wards. Briefly, one boy's secondary school (Kakamega High School in Shirere ward), one girl's secondary school (Shikoti Girls in Butostso



East) and two mixed secondary schools were also selected, one within the municipality (Ikonyero Secondary School) and the other outside the municipality (Mwiya Secondary School).

Participants were systematically sampled, a complete list of students was obtained from the selected schools, and a sample was drawn. A sampling interval (K) was determined using the formula: $K=N/n$.

Where: (N) was the population size and (n) was the sample size. From each ward, the calculation was as follows:

In Shirere ward (Kakamega High school), $K=5126/133=39$

In Mahiakalo ward (Mwiya secondary school), $K=4395/112=39$

In Butsotso Central ward (Ikonyero secondary school), $K=4249/109=39$

In Butsotso East ward (Shikoti Girls secondary school), $K=2667/68= 39$

Hence $K^{th}=39$

From each list, one (1) was selected as random number. Starting from the randomly selected number (1), every 39th student was chosen until the desired population size was achieved in that school.

Sample size determination

The sample size was determined using Fisher's formula at a 95% significance level. The desired sample size (n) was determined by:

$$n = (Z^2 * P * Q) / d^2$$

Where:

N = desired sample size (for populations greater than 10,000), which is 16,527 (14)

Z = Significance level of 95%, corresponding to 1.96.

P = proportion in the target population thought to have a certain feature, and if there is no reasonable estimate, then use 50% (0.5), $q=1-p$

q = complementary probability to P ($q = 1 - P$)

d = degree of accuracy (set at 5% = 0.05) $n=1.96^2 \times p(1-p) \div d^2$ = sample size required

$$n = 1.96^2 \times 0.5(1-0.5) \div 0.05^2$$

n = 384 students + 10% attrition rate, to cater for the dropout rate.

Total sample n = 422

Data collection and analysis

Data were collected using a structured questionnaire. Two research assistants were trained on data collection protocols, ethical considerations, and the use of the study tool. The data was entered, coded, cleaned and analysed using the Statistical Package for Social Sciences (SPSS 25.0).

Ethical considerations

Ethical clearance was sought from Masinde Muliro University of Science and Technology Institutional Scientific Ethical and Review Committee (MMUST-ISERC) (MMUST/IERC/200/2023) and a research licence from the National Commission of Science, Technology and Innovation (NACOSTI) (NACOSTI/P/23/32196).

Permission was also obtained from the Ministry of Education (MOE), Kakamega County. Consent was obtained from the guardians of study participants. Data was coded to maintain anonymity.

Table 1:

Number of Students Sampled Per Secondary School Summary

Wards	Secondary school	Proportional calculations
Shirere	Kakamega School	$422/16437 \times 5126 = 133$
Mahiakalo	Mwiya secondary	$422/16437 \times 4395 = 112$
Butsotso Central	Ikonyero secondary	$422/16437 \times 4249 = 109$
Butsotso East	Shikoti girls	$422/16437 \times 2667 = 68$
Total no of students		422



Results

Sociodemographic characteristics

Student distribution per the grade was as follows: the majority were in the second Form (42.7%, n=176), the third Form had the second largest population (27.2%, n=112), while those in the first Form were (19.7%, n=81), and a handful were in the fourth Form (10.4%, n=43). In terms of age, 10.9% (n=45) of the participants were 14 years old, 21.4% (n=88) were 15 years old, 22.8% (n=94) were 16 years old, 26.7% (n=110) were 17 years old, and 18.2% (n=75) were 18 years old.

By gender, 52.9% (n=218) of the students were female, while 47.1% (n=194) were male. Table 2. The degree of PA participation was examined, and the findings are presented in Figure 1.

Table 3 represents the results of physical activity practices among secondary school students. The majority of the students engaged in physical activity, 54.1% (n=223), while 45.9% (n=189) did not. Besides, about 27.2% (n=112) participated in ball games, 24.8% (n=102) in athletics and 4.6% (n=19) in indoor games.

Table 2:
Sociodemographic Characteristics of the Students

Variable	Category	N	%
Level of study	Form one	81	19.7
	Form two	176	42.7
	Form three	112	27.2
	Form four	43	10.4
Age	14 years	45	10.9
	15 years	88	21.4
	16 years	94	22.8
	17 years	110	26.7
	18 years	75	18.2
Gender	Male	194	47.1
	Female	218	52.9
School name	Shikoti Secondary	109	26.5
	Mwiyala Secondary	112	27.2
	Ikonyero Secondary	63	15.3
	Kakamega high	128	31.0

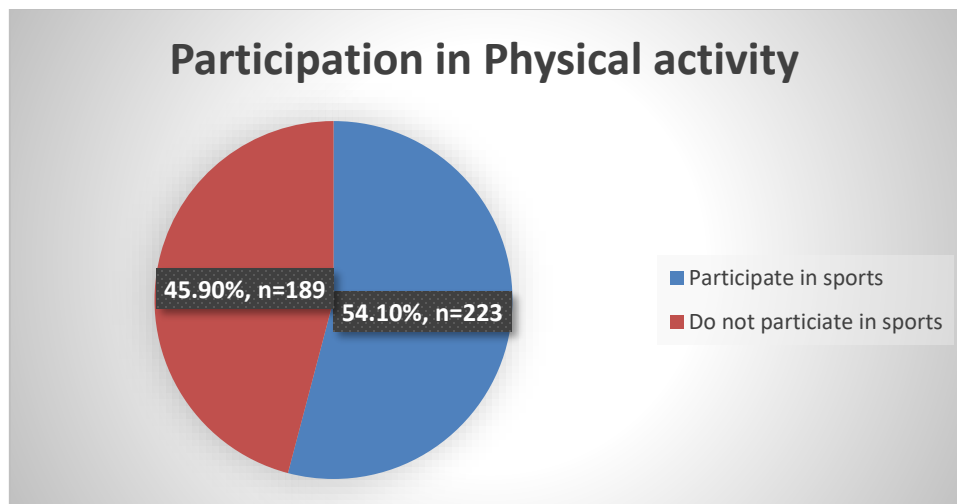


Figure 1:
Participation in physical activity



Additionally, only 5.1% (n=21) engaged moderately in PA outside school hours, while those who were active and sedentary (Little to no physical activity) were represented by 31.8% (n=131). Those who were very active in physical activity were 17.7% (n=73), while those who engaged in minimal physical activity (low) were 18.0% (n=74).

The majority of students, 32.0% (n=132), did not participate in physical activity; however, for those who participated, a quarter participated 3-4 times per week, 25.2% (n=104), while less than a quarter, 21.4% (n=88), participated in physical activity daily. Additionally, some 31.8% (n=131) rarely

participated in any physical activity. Moreover, some students 28.9% (n=119) participated in physical activity during break time, while a small fraction 17.9% (n=74) participated in PA during their free time both at home and school. Additionally, 21.4% (n=88) participated in PA only during P.E. lessons. Notably, many students indicated that they preferred to engage in physical activity in outdoor sports fields/courts, 48.1% (n=198), 22.8% (n=85) preferred fitness centres/gyms, 22.8% (n=94) preferred at home, while 8.5% (n=35) preferred community recreational centres. In addition a set of three questions were asked and the findings are presented in Table 4.

Table 3:
Results of Physical Activity Practices among Secondary School Students

Variable	Category	N	%
<i>Do you participate in physical activity?</i>	Yes	223	54.1
	No	189	45.9
<i>If yes, what physical activity do you participate in?</i>	Ball games	112	27.2
	Athletics	102	24.8
	Indoor games	19	4.6
	None of the above	179	43.4
<i>How would you describe your overall level of physical activity outside school hours?</i>	Sedentary (Little to no physical activity)	131	31.8
	Low (Minimal physical activity)	74	18.0
	Moderate (Engaging in physical activity occasionally)	21	5.1
	Active (Regular participation in physical activities)	113	27.4
	Very active (Engaged in vigorous physical activity regularly)	73	17.7
<i>How often do you participate in the physical activity mentioned?</i>	Daily	88	21.4
	3-4 times per week	104	25.2
	1-2 times per week	31	7.5
	Rarely	57	13.8
	Never	132	32.0
<i>What time do you participate in physical activities?</i>	During break time	119	28.9
	During P.E lessons	88	21.4
	During my free time at home/school	74	17.9
	Rarely	131	31.8
<i>Where do you prefer to engage in physical activities</i>	Outdoor sports field/courts	198	48.1
	Fitness centre/gym	85	20.6
	Home	94	22.8
	Community recreation centres	35	8.5



As shown in Table 4, 26.5% (n=109) of the students agreed and 24.8% (n=102) strongly agreed that they exercised for at least 60 minutes per day. However, 21.8% (n=90) of students disagreed, and 12.1% (n=50) strongly disagreed that they exercised for at least 60 minutes. Most of the students, 43.4% (n=179), agreed that they participated in PA sessions at least 3 times a week, 25.0% (n=103) strongly agreed, while 14.3% (n=59) disagreed that they participated in physical activity at least three times a week.

Most students strongly agreed 29.9% (n=123), 28.9% (n=119) agreed, while 13.6% (n=56) disagreed, and 8.5% (n=35) strongly disagreed that they trained within their heart rate zones.

Independent t-test of the socio-demographics (gender) and practices of physical activity

An independent-sample t-test was conducted to determine gender differences in physical activity. The results were as follows: (t (438) = -0.338, p=0.734) in the scores for males (M=2.17, SD=0.690) and females (M=2.23, SD=0.728). The magnitude of the difference in the means was (-0.054, 95% CI: -0.188 to 0.081)

as presented in Table 5.

Discussion

Physical activity participation among secondary school students

A good healthy lifestyle free of illnesses could be attained through regular participation in physical exercise. In the context of physical activity, practice refers to a behaviour that individuals engage in regularly and consistently over time, rather than a one-time occurrence (15). In the current study, the majority of students participated in physical activity, 54.1%, and participation in ball games was popular 112 (27.2%). These findings corroborate Isfahan's (16) that found the majority of students participating in PA. The research also found that the students loved ball games 27.2% more than indoor games, 4.6%, which could be attributed to the fact that ball games are popular globally.

Students participated in PA at break time (28.9%) and in physical education lessons (21.4%) in the current study. These results diverge from previous findings, which indicated that most students engaged actively in physical activity during the physical education time (3).

Table 4:

Results of the Practice of Physical Activity among Secondary School Students

Variable	Strongly Disagree	Disagree		Not sure		Agree		Strongly Agree		
	n	%	n	%	N	%	n	%	n	%
<i>I always exercise for at least 60 minutes per day</i>	50	12.1	90	21.8	61	14.8	109	26.5	102	24.8
<i>I participate in physical activity sessions at least 3 times a week</i>	23	5.6	59	14.3	48	11.7	179	43.4	103	25.0
<i>I always train within my heart rate target zone.</i>	35	8.5	56	13.6	79	19.1	119	28.9	123	29.9

Table 5:

Socio-Demographics and Knowledge of Physical Activity

Variable	Male		Female		t(438)	p	95%CL		Cohn's d'
	M	SD	M	SD			LL	UL	
Scores	2.17	0.69	2.23	0.728	-0.338	0.734	-0.188	0.081	0.84



However, the study was limited to P.E. time, and it did not assess the physical activity during the students' free time and break time in school.

The current study showed a high level of active participation in regular physical activity, which corroborates a cross-sectional study conducted in Norway (2), and reported that boys engaged more in PA than girls; however, boys scored high on strength training, as compared to girls, who indicated participation in aesthetic training mainly. This is consistent with several other studies conducted globally (3; 10; 17; 18).

Adolescents in middle and secondary school levels scored higher in physical activity participation as reported elsewhere (19). However, physical activity participation among children living in urban areas was low in contrast to those living in rural areas (20). This could be due to the congestion and the sedentary lifestyle of most city dwellers, which means that most of the children mainly engage in screen time rather than actual physical activity. Thus, increased screen time and advanced technology has resulted in diminished PA participation among both adults and children (20). As a result, these kids are prone to lifestyle diseases such as obesity, diabetes and hypertension.

In the current study, there were no significant differences in participation activity across gender, differing from previous findings where boys engaged in physical activity more than girls(20).

Conclusions and Recommendations

Most of the students participated in physical activity, and ball games were a popular physical activity, followed closely by athletics. Additionally, both male and female students engaged in physical activity.

We recommend more sensitization to encourage students' engagement level in physical activity. There is also a need to develop and promote peer education programs where students

can influence and motivate each other to participate in physical activities.

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Authors' contributions

The study work was shared among the researchers, JM collected the sample, analysis and manuscript preparation. EW and RO participated in the technical writing and review of the manuscript before submission for publication.

Data availability. This data is available upon formal request to the corresponding author.

Conflict of interest. No conflict of interest.

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References

1. Chang CH, Hsu YJ, Li F, Tu YT, Jhang WL, Hsu CW, et al. Reliability and validity of the physical activity monitor for assessing energy expenditures in sedentary, regularly exercising, non-endurance athlete, and endurance athlete adults. *PeerJ*. 2020;8. <https://doi.org/10.7717/peerj.9717>
2. Guddal MH, Stensland SØ, Småstuen MC, Johnsen MB, Zwart JA, Storheim K. Physical activity and sport participation among adolescents: Associations with mental health in different age groups. Results from the Young-HUNT study: A cross-sectional survey. *BMJ Open*. 2019;9(9). <https://doi.org/10.1136/bmjopen-2018-028555>
3. Hollis JL, Sutherland R, Williams AJ, Campbell E, Nathan N, Wolfenden L, et al. A systematic review and meta-analysis of moderate-to-vigorous physical activity levels in secondary school physical education lessons. *Int J Behav Nutr Phys Act*. 2017;14(1). <https://doi.org/10.1186/s12966-017-0504-0>



4. Mogaka E, Bukhala P, Nguka G. Determinants of Participation in Physical Activity among School Going Adolescents with Disabilities in Kakamega County, Kenya. *IOSR J Sports Phys Educ (IOSR-JSPE)*. 2017;4(4):42–52. <https://doi.org/10.9790/6737-04044252>
5. Akbarali R, Kin R. The Perceived Barriers to Exercise and Physical Activity for Individuals with Metastatic Cancer Undergoing Chemotherapy: A Qualitative Exploration. 2018.
6. World Health Organization. Global status report on physical activity 2022. *Geneva: WHO; 2022*.
7. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. 2020;54(24). <https://doi.org/10.1136/bjsports-2020-102955>
8. Gomes TN, Thuany M, dos Santos FK, Rosemann T, Knechtel B. Physical (in)activity, and its predictors, among Brazilian adolescents: a multilevel analysis. *BMC Public Health*. 2022;22(1). <https://doi.org/10.1186/s12889-021-12336-w>
9. Lu C, Stolk RP, Sauer PJJ, Sijtsma A, Wiersma R, Huang G, Corpeleijn E. Factors of physical activity among Chinese children and adolescents: A systematic review. *Int J Behav Nutr Phys Act*. 2017;14(1). <https://doi.org/10.1186/s12966-017-0486-y>
10. Ackah M, Owiredo D, Salifu MG, Osei Yeboah C. Estimated prevalence and gender disparity of physical activity among 64127 in-school adolescents (aged 12–17 years): A multi-country analysis of Global School-based Health Surveys from 23 African countries. *PLOS Glob Public Health*. 2022;2(10):e0001016.
11. Kariuki MP. Attitude and Practice of Primary School Pupils, teachers and Head Teachers in physical education in Kiambu County, Kenya: School of Applied Sciences, Kenyatta University; 2017.
12. Onywera VO, Muthuri SK, Hayker S, Wachira LJ, Kyallo F, Mang'eni RO, et al. Results from Kenya's 2016 report card on physical activity for children and youth. *J Phys Act Health*. 2016;13(s2):S195-S200.
13. County Government of Kakamega. County Integrated Development Plan 2023-2027. Kakamega (Kenya): Kakamega county; 2023.
14. Ministry of Education Quality Assurance. School enrollment in Kakamega County. 2023.
15. Qwabe NAP. *Qwabe_m_chs_2023* University of KwaZulu-Natal; 2023.
16. Vaezi A, Heidari H, Farajzadegan Z. Knowledge, k, and Pattern of Physical Activity in Middle School Students in Isfahan, 2015. *Adv Biomed Res*. 2020;9(1):1. https://doi.org/10.4103/abr.abr_75_19
17. Almutairi N, Burns S, Portsmouth L. Physical activity knowledge, attitude, and behaviors among adolescents in the Kingdom of Saudi Arabia prior to and during COVID-19 restrictions. *J Obes*. 2022. <https://doi.org/10.1155/2022/1892017>
18. Sun T, Zhang H, Kong Z, Yang J, Jia X. Knowledge, attitude, and practice of body shape and fitness among university students in China. *BMC Public Health*. 2023;23(1). <https://doi.org/10.1186/s12889-023-16122-8>
19. Dawood AA. Student attitudes toward physical and athletic activity and its impact on social interaction between peers. *Electron Compr J Educ Sci Publ*. 2020;33.www.mecsj.com
20. Ra M, Rahim Na A, Sm M, Yusof A, Yusof HA. Knowledge, Attitude, and Practice Regarding Exercise and Exergames' Experiences among High-School Students in Pulau Pinang, Malaysia. 2022.
21. Ziari A, Ziaefar E, Bozorgi H, Taherian J, Aghae Masule M, Emadi A. Physical Activity; Knowledge, Attitudes, and Practices of Students Living in Semnan University of Medical Sciences Dormitories in Semnan, Iran. *Middle East J Rehabil Health*. 2017;4(2). <https://doi.org/10.5812/mejrh.44743>