Are Students in Public High Schools in South Africa Physically Active?

Outcome of the 1st South African National Youth Risk Behaviour Survey

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ABSTRACT

Background: The first Youth Risk Behaviour Survey in South Africa was carried out to establish the prevalence of key health risk behaviours among high school students. Though physical inactivity is a commonly reported contributory factor to chronic diseases of lifestyle in South Africa, there is no reliable national database on the participation of children and adolescents in physical activity.

Methods: This cross-sectional national prevalence study among students attending government schools in the nine provinces in South Africa utilized a two-stage cluster sample design. Statistical analysis allowed for clustered sampling, and data collected through self-administered questionnaire were weighted to reflect the underlying student population.

Results: Data of 10,699 participants were analyzed. More than one third (37.5%) of the students engaged in insufficient physical activity. By population group, a significantly lower proportion of white students (29.4%) than black (37.5%) and coloured students (45.6%) engaged in insufficient physical activity. Among those who abstained from participation, 25.9% were unwilling to participate, with significantly fewer white (26.8%) and black (25.1%) students feeling unsafe in their surroundings compared with coloured students (35.3%). Significantly fewer white students (5.6%) had no access to facilities compared to black students (17.0%). White students and students in higher grades reported lower rates of physical education classes at school.

Interpretation: Though the promotion of physical activity and healthy lifestyle is a national priority in South Africa, the survey indicates the need to pay attention to an appreciable proportion of high school students who do not participate sufficiently in physical activity.

MeSH terms: Physical activity; youth; health behavior

La traduction du résumé se trouve à la fin de l'article.

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In 2002, the National Department of Health, in partnership with the Department of Education, commissioned the Medical Research Council of South Africa to undertake the first Youth Risk Behaviour Survey (YRBS) in South Africa.¹ The survey was to obtain information on the behaviours that placed school-going youths at risk, in order to develop appropriate intervention programs. The Youth Risk Behaviour Surveillance System (YRBSS), developed by the Centers for Disease Control (CDC) in the United States of America (USA) in 1990, was aimed at monitoring priority health risk behaviours that impact on the main causes of morbidity, mortality and social problems among youths.²

Participation in physical activity was one of the health risk behaviours monitored in the surveys in the USA and South Africa. Physical activity encompassed activities ranging from taking the stairs regularly, dancing and walking briskly, to jogging, biking and practicing sports.³ Physical activity has beneficial effects on musculoskeletal health, several components of cardiovascular health, adiposity in overweight youths, and blood pressure in mildly hypertensive adolescents.⁴

Physical inactivity is a commonly reported contributory factor to chronic diseases of lifestyle in South Africa.⁵⁻⁷ Though the promotion of physical activity and healthy lifestyles has become a national priority,⁸ there is no reliable database on the current status of involvement of youth in physical activity. The YRBS in late 2002 therefore offered opportunity for the first nationally representative study on the prevalence of physical activity and inactivity among students in high schools in South Africa.

This manuscript presents the outcome of the aspect of the YRBS that dealt with participation in physical activity, reporting the prevalence data on participation at levels insufficient to gain any health benefits, the reasons given for abstaining from physical activities, and the activities which took place during physical education (PE) classes.

METHODS

South Africa consists of nine provinces with 11 official languages, having a population of about 46.6 million citizens, with

TABLE I**Sample Demographics (N = 10,699)**

Male	46.0%
Female	54.0%
Population groups	
Black	79.5%
Coloured	9.0%
White	8.9%
Indian	1.4%
Other	1.2%
Grade in school	
Grade 8	31.4%
Grade 9	30.2%
Grade 10	22.6%
Grade 11	15.9%
Age (yrs)	
≤13	8.4%
14	15.3%
15	17.7%
16	20.1%
17	16.5%
18	9.1%
≥19	12.9%

children and adolescents making up 43.5% or just over 20 million of the population. The population was classified into black (79.3%), white (9.5%), coloured (8.8%), and Indian (2.4%) population groups as an instrument of apartheid.⁹

Sample

The survey was conducted among students in grades 8 through 11, attending public high schools.¹ Independent or private schools were excluded from the study population, as their students accounted for only 2.2% of total student population in South Africa. Students in grade 12 were also excluded to avert possible conflict with a busy examination schedule. Ethical approval was obtained from the South African Medical Association, and permission was obtained from the National Department of Education, school principals, parents and students. Participants completed the self-administered questionnaire in the classroom under the supervision of trained research assistants.

A two-stage sample design was utilized, first stratified by the country's nine provinces. Schools were the primary sampling units, and were selected with a probability proportional to school student size in grades 8 to 11. At the second stage of sampling, classes within each participating school were selected systematically with equal probability sampling (with a random start). Details about the sampling design are in the report on the YRBS.¹

The CDC questionnaire for YRBSS was modified for use in South Africa, to allow for local factors like language and culture. For vigorous and moderate physical activi-

TABLE II**Percentage of High School Students Who Participated in Insufficient Or No Physical Activity by Gender, Population Grouping, and School Grade**

		Male	Female	Total
National	%	34.4	43.0	37.5
		LCL†	41.0	36.0
	%	36.5	45.0	39.0
		UCL‡		
	Population group: Black	34.4	42.4	37.5
		LCL†	40.3	35.9
	%	36.6	44.6	39.1
		UCL‡		
	Coloured	36.8	56.8	45.6
		LCL	48.3	39.7
	%	41.3	65.2	51.4
		UCL		
	White	28.2	37.0	29.4
		LCL	29.8	24.3
	%	34.9	44.2	34.6
		UCL		
	Indian	40.8	36.0	33.0
		LCL	24.9	25.4
	%	54.7	47.0	40.7
		UCL		
	Other	54.8	59.4	54.8
		LCL	41.4	39.5
	%	72.0	77.3	70.1
		UCL		
Grade:	8	38.0	41.8	38.7
		LCL	37.5	35.2
		UCL	46.1	42.2
		%	32.9	43.4
	9	29.9	39.9	33.5
		LCL	35.9	38.6
		UCL	43.1	37.3
		%	30.4	43.1
	10	24.7	38.5	33.6
		LCL	47.6	41.1
		UCL	44.4	38.1
		%	35.7	44.4
	11	29.2	39.6	33.6
		LCL	49.3	42.7
		UCL		
		%		

† Lower 95% Confidence Limit; ‡ Upper 95% Confidence Limit

ty, the questions and response options were unchanged but for the examples given, e.g., "swimming laps" was excluded and "rugby" was added. Questions on reasons for inactivity and types of activity performed during PE classes were added, to help understand factors affecting participation in physical activity. In addition, participants were given the option to complete the questionnaire in one of the 11 official languages. For each language, panels of first-language speakers translated and back-translated the questionnaire, and then compared against the original to ensure that integrity was maintained. All 11 language versions of the questionnaire were further refined through pilot studies, which included discussions with students who had completed the questionnaire, to determine the extent of their comprehension of the questions.

Variables examined

The questionnaire sought information on participation in physical activity. Participation in sufficient vigorous physical activity was defined as participation in activities like rugby, soccer, netball and basketball for 20 minutes or more on 3 or more of the 7 days preceding the survey. Participation in sufficient moderate physi-

cal activity was defined as participation in activities like brisk walking, slow bicycling, skating, pushing the lawn mower, mopping, polishing or sweeping the floor, for 30 minutes or more on 5 or more of the 7 days preceding the survey. Whether a student participated in sufficient vigorous and/or moderate physical activities to gain any health benefit was derived from the above. Other variables examined were reasons for abstaining from participation in physical activity in the 7 days preceding the survey, and types of activities carried out during PE classes.

Data analysis

Epi Info¹⁰ was used to analyze the data. Data were weighted to take account of the provincial, gender and grade make-up of South Africa's 3,539,329 grade 8-11 government school students, according to the National Department of Education's statistics. Epi Info makes an adjustment in the analysis for the design effect (non-independence) resulting from sampling within clusters. The Intra-Cluster Correlations (ICC) for the variables examined were calculated using ANOVA to be in the range 0.04 to 0.08. Prevalence rates and 95% confidence intervals were computed. Differences between prevalence estimates were consid-

TABLE III

Percentage of High School Students Who Did Not Take Part in Physical Activity in the Past Week (Reasons Given) by Gender, Population Group, and School Grade

		Did Not Want to Take Part in Physical Activity			Was Ill			Felt Unsafe			No Access to Facilities			Don't Know the Reason for Inactivity		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
National	%	23.9	27.1	25.9	21.2	17.8	19.1	8.8	6.0	7.0	15.4	15.8	15.7	30.8	33.3	32.3
	LCL†	21.6	24.6	24.4	19.0	15.4	17.1	7.5	4.6	6.0	12.6	12.8	12.9	27.6	30.3	30.0
	UCL‡	26.2	29.6	27.3	23.3	20.2	21.0	10.0	7.3	8.1	18.2	18.9	18.4	34.0	36.3	34.7
Black	%	23.1	26.3	25.1	21.1	17.5	18.9	8.9	6.6	7.4	17.0	17.0	17.0	29.9	32.7	31.6
	LCL†	20.4	23.0	23.4	18.8	14.9	16.8	7.4	5.0	6.3	13.7	14.6	14.7	26.4	29.5	29.2
	UCL‡	25.8	29.7	26.8	23.4	20.1	20.9	10.4	8.1	8.6	20.3	19.4	19.3	33.4	35.8	34.1
Coloured	%	28.6	40.4	35.3	21.4	16.2	18.5	10.8	4.6	7.3	9.9	5.8	7.5	29.3	33.1	31.4
	LCL	25.0	35.6	31.8	15.0	12.3	14.5	6.6	3.3	5.3	7.1	3.7	5.8	23.2	27.9	27.1
	UCL	32.3	45.2	38.8	27.8	20.1	22.4	15.1	5.8	9.2	12.7	7.9	9.2	35.3	38.2	35.8
White	%	25.3	27.7	26.8	21.4	24.6	23.4	1.9	1.4	1.6	8.2	4.1	5.6	43.2	42.2	42.6
	LCL	16.2	21.3	21.0	9.6	19.6	17.4	-0.2	0.3	0.6	2.1	1.2	2.7	29.8	36.2	36.5
	UCL	34.4	34.1	32.6	33.2	29.7	29.5	4.0	2.5	2.6	14.2	7.0	8.6	56.5	48.2	48.7
Indian	%	33.7	44.6	39.2	20.4	3.3	11.7	11.3	4.3	7.7	9.0	3.3	6.1	25.5	44.6	35.2
	LCL	15.9	30.2	27.3	-3.0	0.2	-0.8	2.0	-1.9	2.4	-5.8	-1.9	-1.7	9.8	30.9	22.7
	UCL	51.5	59.0	51.2	43.8	6.3	24.2	20.7	10.4	13.1	23.8	8.6	13.9	41.2	58.2	47.7
Other	%	18.8	9.3	13.9	33.0	43.4	38.3	7.7	6.0	6.8	1.9	6.6	4.4	38.6	34.7	36.6
	LCL	1.9	-2.6	1.3	16.8	19.3	24.3	-4.3	-4.3	-1.1	-1.9	-3.2	-1.4	14.0	22.1	24.5
	UCL	35.7	21.2	26.5	49.1	67.5	52.3	19.6	16.4	14.8	5.8	16.5	10.1	63.3	47.2	48.7
Grade: 8	%	26.8	24.3	25.4	23.4	20.9	22.0	6.0	6.8	6.4	8.9	11.2	10.2	34.9	36.8	36.0
	LCL	23.1	20.0	22.5	19.9	16.9	19.3	4.2	4.7	4.7	6.7	8.0	8.0	30.1	32.5	32.5
	UCL	30.5	28.5	28.2	26.9	24.9	24.7	7.7	8.9	8.1	11.0	14.4	12.4	39.8	41.2	39.5
9	%	24.9	27.0	26.1	22.2	17.0	19.2	11.8	6.8	8.9	14.0	14.5	14.3	27.2	34.7	31.5
	LCL	21.4	23.4	23.8	17.2	12.7	15.5	9.1	4.8	7.1	10.9	11.8	12.3	22.6	29.7	27.9
	UCL	28.3	30.7	28.5	27.2	21.2	22.8	14.5	8.8	10.7	17.0	17.3	16.3	31.8	39.7	35.2
10	%	18.6	28.2	25.3	17.6	14.1	15.2	9.9	5.6	6.9	23.0	19.8	20.8	30.8	32.3	31.8
	LCL	13.8	23.8	22.1	13.1	9.6	11.2	6.7	3.0	4.4	12.9	12.5	13.1	24.6	26.9	26.8
	UCL	23.3	32.6	28.4	22.2	18.6	19.2	13.2	8.2	9.4	33.2	27.1	28.5	37.1	37.7	36.9
11	%	23.6	29.8	27.4	19.8	21.1	20.6	7.5	4.0	5.4	20.1	17.7	18.7	29.0	27.4	28.0
	LCL	17.5	24.2	23.0	13.1	15.3	16.1	3.6	2.2	3.8	13.8	13.9	15.3	18.1	23.0	22.5
	UCL	29.8	35.5	31.7	26.5	26.9	25.0	11.4	5.8	7.1	26.4	21.5	22.0	39.9	31.7	33.5

† Lower 95% Confidence Limit; ‡ Upper 95% Confidence Limit

ered statistically significant ($p < 0.05$) if the confidence intervals did not overlap.

RESULTS

A total of 206 schools were eligible to participate in the survey, and 14,766 students in 364 classes were randomly selected. However, 10,699 students (54.0% females, 46.0% males; Table I) in 345 classes from 188 schools submitted completed questionnaires. In the 94.2% of sampled schools that participated, 72.5% of sampled students completed the questionnaires, giving an overall response rate of 68.3%. Most of the students were in grades 8 and 9, and aged 13-18 years (Table I).

Over one third (37.5%) of students did not participate in physical activity that was sufficient to gain any health benefit, or abstained from physical activity during the 7 days preceding the survey (Table II). Significantly, more females (43.0% [41.0-45.0]) than males (34.4% [32.3-36.5]) participated in insufficient or no physical activity, and the gender difference was significant within the black and coloured groups (Table II). Significantly more

coloured students (45.6% [39.7-51.4]) participated in insufficient or no physical activity compared to black (37.5% [35.9-39.1]) and white students (29.4% [24.3-34.6]). There was no significant variation by grade.

Among those who reported that they did not take part in any physical activity during the week preceding the survey, 25.9% reported that they were simply unwilling to take part, with no significant difference between male and female students (Table III). Other students did not take part in physical activity because they were ill (19.1%), felt unsafe in their surroundings (7.0%), or had no access to physical activity equipment (15.7%). Almost one third of the students (32.3%) did not have a reason for their inactivity.

Significantly more coloured students (35.3% [31.8-38.8]) than black (25.1% [23.4-26.8]) and white students (26.8% [21.0-32.6]) reported that they were unwilling to take part in physical activity. Significantly fewer white students (1.6% [0.6-2.6]) felt unsafe in their surroundings compared to black (7.4% [6.3-8.6]) and coloured students (7.3% [5.3-9.2]). Significantly fewer white students (5.6%

[2.7-8.6]) did not have access to facilities for physical activity compared to black students (17.0% [14.7-19.3]). Again, there was no significant variation by grade.

Nationally, 29.0% of the students did not have PE classes at school, 52.8% were engaged in vigorous physical activity during PE periods, while 7.8% were engaged in life skills education or some class discussions during PE periods (Table IV). Significantly more white students (53.1% [44.9-61.4]) had no PE classes at school, when compared to black (23.0% [21.2-24.8]) and coloured students (31.5% [25.7-37.3]). Also, white students who had PE classes at school were significantly less likely to engage in vigorous activity during those classes. More students in higher grades reported no PE classes at school, and those who did were less likely to engage in vigorous activity in the classes.

DISCUSSION

As this was the first national survey, there are no previous data to compare with to identify possible trends. Thus, the outcomes of this survey contributed to the baseline data on the level of participation

TABLE IV

Percentage of High School Students Engaged in Various Activities During Physical Education Classes by Gender, Population Group, and School Grade

		No Physical Education Classes at School			Engaged in Vigorous Activity			Engaged in Life Skills Education / Class Discussion		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
National	%	26.5	30.9	29.0	60.8	46.5	52.8	4.2	10.7	7.8
	LCL†	24.1	27.2	26.0	57.6	41.4	48.8	3.3	9.3	6.8
	UCL‡	28.9	34.6	31.9	63.9	51.5	56.7	5.1	12.1	8.8
Black	%	23.0	28.3	26.0	65.1	50.5	56.9	3.3	9.4	6.7
	LCL†	21.2	24.4	23.3	62.4	45.2	53.0	2.4	8.1	5.9
	UCL‡	24.8	32.2	28.6	67.8	55.8	60.7	4.1	10.8	7.6
Coloured	%	31.5	33.6	32.6	49.4	36.7	42.6	11.8	16.6	14.4
	LCL	25.7	24.6	26.0	43.3	25.2	36.0	7.7	10.3	9.6
	UCL	37.3	42.5	39.1	55.5	48.1	49.2	15.9	23.0	19.1
White	%	53.1	57.4	55.5	31.7	18.5	24.4	4.9	11.3	8.5
	LCL	44.9	47.3	46.9	22.7	10.0	16.3	1.3	6.1	4.5
	UCL	61.4	67.4	64.0	40.7	27.0	32.5	8.5	16.6	12.4
Indian	%	43.7	44.2	44.0	49.3	41.4	45.3	4.0	5.0	4.5
	LCL	12.7	19.2	17.1	22.3	21.2	23.5	-0.8	0.1	0.5
	UCL	74.7	69.3	70.8	76.3	61.7	67.2	8.7	9.9	8.5
Other	%	22.4	22.9	22.6	62.4	53.8	58.8	0.0	3.6	1.5
	LCL	5.9	10.2	12.1	34.4	37.5	45.1	-	-1.1	-0.3
	UCL	38.8	35.6	33.1	90.3	70.1	72.6	-	8.3	3.3
Grade: 8	%	22.5	22.5	22.5	64.9	56.1	60.3	4.3	10.5	7.6
	LCL	18.4	18.5	19.2	60.6	51.1	56.4	2.8	8.0	5.7
	UCL	26.6	26.6	25.8	69.3	61.1	64.3	5.8	13.1	9.4
9	%	21.8	24.7	23.3	67.9	53.8	60.5	4.5	11.0	7.9
	LCL	18.7	20.8	20.2	63.8	48.9	56.5	3.1	9.1	6.6
	UCL	24.9	28.5	26.4	72.1	58.8	64.6	6.0	12.8	9.2
10	%	32.4	41.7	38.3	54.4	36.2	42.8	2.8	9.3	6.9
	LCL	26.6	34.9	32.3	48.0	24.6	33.2	1.6	5.9	4.5
	UCL	38.3	48.6	44.3	60.7	47.8	52.5	3.9	12.7	9.3
11	%	34.5	34.3	34.4	48.6	37.8	42.8	5.4	13.4	9.8
	LCL	29.4	27.4	28.8	42.4	31.9	37.7	3.0	10.0	7.4
	UCL	39.6	41.1	39.9	54.9	43.7	47.8	7.7	16.8	12.1

† Lower 95% Confidence Limit; ‡ Upper 95% Confidence Limit

in physical activity among youths in South Africa. The government of South Africa produced the white paper titled “Getting the Nation to Play”, geared towards encouraging youth and adults to participate in physical activities.⁸ However, physically active or sedentary lifestyle is both a matter of individual choice and a function of an environment that promotes activity or inactivity. Social cognitive theory and ecological models have pointed to multiple aspects of the physical environment that may influence people’s physical activity on a daily basis.¹¹

Nationally, more than a third of the students chose to participate either in insufficient physical activity to gain any health benefit or not at all. A number of environmental factors could have influenced these choices. It is possible that these students were unaware of the health outcomes of being physically active,¹² and access to the information may help the students to decide to participate in physical activity. There is evidence that policies at school can influence students’ participation in physical activity.¹³ Many of the senior students did not have PE in their classes, nor took part in vigorous physical activity dur-

ing PE classes in spite of the national goal of encouraging a physically active lifestyle. It may be that the schools focused on core academic subjects during the school day with little or no time for physical education. This lack of co-ordination of government policies in health and education only increases sedentary behaviour among the students.

Two other aspects of the physical environment that influenced non-participation in physical activity were access to facilities and the reputation of the neighbourhood.¹¹ The proportion of white students who did not have access to facilities was significantly lower than the proportions of coloured and black students. Similarly, significantly fewer white students felt unsafe in their surroundings compared to coloured and black students. Research has reported that lack of access to facilities for physical activity increases the risk of being overweight/obese, while access to facilities increases walking and participation in sports activities.¹⁴ Similarly, living in an unsafe environment discourages walking and overall physical activity.

The proportion of students in this survey who did not take part in sufficient

physical activity or in any physical activity (37.5%) was similar to the proportion (33.4%) of students in the United States in a similar survey.¹⁵ Physical inactivity has become a major public health problem, contributing to the chronic, non-communicable disease epidemic. If there is no attempt at behavioural intervention, this group of students will grow up into adults who continue to lead physically inactive lifestyles. Efforts should be geared towards addressing the environmental factors that could have inhibited participation in physical activity in this survey.

Our study has several limitations. First, these results are based upon self-reporting from students, rather than from observation, and as such, may be impacted by self-reporting bias. However, in the design and administration of the survey, various steps were taken to mitigate such bias, such as allowing anonymous and voluntary participation while not in the presence of teachers.¹ Second, the external validity of these results may be limited to those students who attended schools on the day of administration. Students who were absent may have a different physical activity profile. Additionally, the external validity of these

findings may not extend to 2.2% of the school-going population that attend private schools, since these schools were not included in the sampling frame.

CONCLUSION

Appreciable proportions of students in public high schools in South Africa participate in vigorous and sufficient moderate physical activities. However, the proportion of students who do not participate sufficiently in physical activity cannot be ignored. Any interventions should take account of the variation across population groups of both physical inactivity and the environmental factors that enable and encourage exercise.

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RÉSUMÉ

Contexte : L'Afrique du Sud a fait l'objet d'une première enquête visant à déterminer la prévalence des principaux comportements présentant un risque pour la santé chez les élèves du secondaire. La sédentarité est l'un des facteurs contributifs les plus communément liés aux maladies chroniques dues au mode de vie en Afrique du Sud, mais il n'existait pas jusqu'ici de base de données fiable, à l'échelle nationale, sur l'activité physique chez les enfants et les adolescents.

Méthode : L'enquête transversale nationale, qui visait les élèves fréquentant l'école publique dans les neuf provinces d'Afrique du Sud, faisait appel à un échantillonnage à deux degrés. Une analyse statistique a permis un échantillonnage en grappes, et les données recueillies au moyen de questionnaires à remplir soi-même ont été pondérées en fonction de la population étudiante sous-jacente.

Résultats : Les données de 10 699 participants ont été analysées. Plus du tiers des élèves (37,5 %) étaient insuffisamment actifs. Selon une analyse fondée sur le segment démographique, une proportion significativement plus faible d'élèves blancs (29,4 %) que d'élèves noirs (37,5 %) et d'élèves de couleur (45,6 %) étaient insuffisamment actifs. Chez ces élèves sédentaires, 25,9 % l'étaient par choix; les élèves qui ne se sentaient pas en sécurité dans leur quartier étaient significativement moins nombreux dans les populations blanche (26,8 %) et noire (25,1 %) que dans la population de couleur (35,3 %). Les élèves blancs étaient significativement moins nombreux que les élèves noirs (5,6 % contre 17 %) à n'avoir accès à aucun équipement sportif. Les cours d'activité physique à l'école étaient moins fréquents chez les élèves blancs et diminuaient à mesure que les élèves progressaient aux niveaux supérieurs.

Interprétation : La promotion de l'activité physique et d'un mode de vie sain a beau être une priorité nationale en Afrique du Sud, cette enquête montre qu'il faudrait s'intéresser davantage à la proportion non négligeable d'élèves du secondaire qui sont insuffisamment actifs.