

PROMOTING PHYSICAL ACTIVITY AT DISADVANTAGED SCHOOLS IN SOUTH AFRICA

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Introduction

The legacy of apartheid is still widely evident in black schools and communities in South Africa. Schools in historically black townships were under resourced and denied access to opportunities to promote health and wellbeing among learners. Today, children from these schools and communities have limited physical activity opportunities due to the shortage of qualified physical education (PE) teachers, the marginalization of PE in the school curriculum, the absence, or poor standard of, facilities and equipment, as well as inadequate provision for extra-curricular and community sports.

Research conducted over the last decade in South Africa has revealed racial inequalities across socioeconomic strata. Black children from the lowest socio-economic quartile are reported to have the lowest levels of participation in physical activity and physical fitness, spend the most time watching television, and were less likely to participate in PE classes than white children (McVeigh, Norris & de Wet, 2004; Sport and Recreation South Africa (SRSA), 2005; Armstrong, Lambert, Sharwood & Lambert, 2006; Armstrong, Lambert & Lambert, 2011). Their sedentary behaviour is detrimental to health. Given this challenge, it is imperative to find innovative and cost effective strategies to promote physical activity and school sport at historically black township schools.



Primary Aim of the Study

This study investigated the effect of a low-cost physical activity-friendly environment in promoting physical activity at three disadvantaged primary schools in South Africa.



Methodology

- The physical activity intervention formed part of the PasSPORT to Health project which was started in 2010, with the aim of involving third year Human Movement Science (HMS) students in the promotion of physical activity and school sport at disadvantaged schools in the area.
- The project provides students with a platform to put theory into practice. HMS students, specializing in Sport Management Practice and Recreation Practice, as part of their experiential learning, are guided through the process of writing funding proposals, obtaining sponsorships, liaising with communities, researching and implementing physical activity-friendly environments in partnership with teachers and community members from project schools.
- The intervention was standardized and included: painted game markings, small equipment and playground stations (balance beams, monkey bars, tyre stations, over/under bars, 5-a-side soccer posts). The total cost for the intervention ranged from R5000.00 to R7000.00 per school, and included donations of equipment and material. The students were assisted by staff members and parents in the installation of the intervention (digging holes, drilling, painting games...).
- The students conducted a leadership camp for the school prefects where they were taught all the games and the correct usage of the playground stations, enabling them to serve as play leaders during recess and the lunch breaks.
- Physical activity was measured using ActiGraph accelerometers. 79 children (boys n=38; girls n=41), ages 9 to 12, from Grades 3 to 6 wore accelerometers for 5 consecutive days, pre- and 6-weeks post-intervention. Only moderate-to-vigorous physical activity (MVPA) is reported here.
- Qualitative interviews were conducted with the school principals (n=3) and selected staff members (n=12) on the effectiveness and use of the intervention.

Results and Discussion

Physical characteristics of the children (n=79)

There were no statistically significant differences between the boys and girls in relation to age ($t = -0.31, p = .759$), stature ($t = -0.80, p = .429$) and body mass ($t = -1.74, p = .086$). However, a significant BMI difference of 1.87 was observed ($t = -2.05, p = .043, d = .46$, small).

Table 1: Children's physical characteristics (mean \pm SD)

	Age (years)	Stature (m)	Body mass (kg)	Body mass index (kg.m ⁻²)
Group (n=79)	10.27 \pm 1.22	138.78 \pm 8.98	35.84 \pm 11.66	18.27 \pm 4.13
Boys (n=38)	10.22 \pm 1.29	137.94 \pm 8.61	33.50 \pm 9.95	17.30 \pm 3.06
Girls (n=41)	10.31 \pm 1.17	139.55 \pm 9.34	38.01 \pm 12.78	19.17 \pm 4.78

In-school MVPA

The results showed an increase in MVPA and a decrease in the sedentary behavior of children, in the short term (6 weeks post-intervention). There was an improvement in MVPA among all groups (see figures 1 and 2), but statistically significant improvements were found for the boys ($t = 2.50, p = .017, d = .41$), girls ($t = 2.38, p = .022, d = .37$) and Grade 3s ($t = 3.20, p = .004, d = .68$). Boys engaged in significantly more MVPA than girls in the post-intervention, 47 minutes versus 38 minutes ($t = 2.11, p = .038, d = 0.48$).

Figure 1: In-school MVPA for group and gender

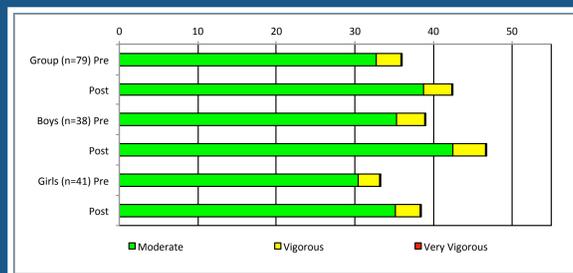
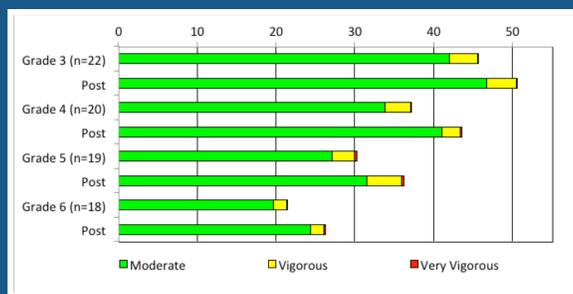


Figure 2: In-school MVPA by grade



The findings are consistent with studies done in England (Ridgers et al., 2007) that concluded that a playground design which utilized multicolour markings and physical structures was suitable for increasing children's recess PA levels, and Australia (Willenberg et al., 2009) who reported that fixed play equipment and bitumen with court and play markings were seen by children as settings inviting active play, impacting positively on moderate PA. Other studies have shown that just using multicolour playground markings (Stratton & Mullan, 2005), providing games equipment (Verstraete et al., 2006), using playground markings and providing jump ropes (Loucaides et al., 2009) all consistently increased children's activity.

The intervention in the present study produced the strongest effect on Grade 3s. These findings are consistent with the findings by Ridgers et al. (2007) who found that intervention effects were stronger on younger children's MVPA compared to older children. The reason espoused for this was that it may be related to the social context of the school playground. Another reason could be that the intervention, with its painted games and structures was more suited to younger children. Feedback and interaction with older children is required to establish their needs and interests.

Compliance with 30 minutes of in-school MVPA

Current guidelines suggest that children should engage in at least 30 minutes of MVPA during the school day (Pate et al., 2006). Figures 3 and 4 highlight the compliance and non-compliance with this recommendation, pre and post-intervention. Increases in compliance with the 30 minute recommendation, post intervention, ranged from 5% (boys) to 22% (girls and Grade 6s). Statistically significant improvements were obtained for the group ($\chi^2(1) = 6.35, p = .012, V = 0.28$), girls ($\chi^2(1) = 7.92, p = .005, V = 0.44$) and grades 6 ($\chi^2(1) = 7.12, p = .008, V = 0.47$).

Figure 3: Compliance with 30 minutes of in-school MVPA: Whole group and gender

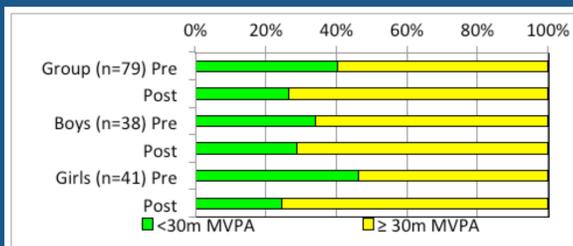


Figure 4: Compliance with 30 minutes of in-school MVPA: Grade



Feedback from schools

- The feedback from interviews conducted with the staff of project schools was overwhelmingly positive with regards to the transformation of the school grounds and its effect on children. Comments from teachers included: "our school looks like a real school now", "our school is bright, colourful and happy now", "it is good to see children play and have fun", "the girls are playing so much more now", "Learners are coming to school earlier to play before school starts", "learners are getting rid of excess energy during breaks and are better able to concentrate on lessons afterwards".
- Involving parents and teachers with the installation of the physical activity intervention was described by a principal as a "team building exercise" which helped to improve school-teacher-parent relationships.
- Teachers reported using the small apparatus, sports equipment and activity stations in the PE component of their Life Orientation lessons, after revealing earlier that there was no specific timetable slot for this component and that children were only taken out sporadically to exercise. Currently, PE is profoundly neglected and detrimentally affected by the marginalization of the subject in the curriculum, the lack of qualified teachers, poor facilities and a paucity of equipment and resources (SSISA, 2011, van Deventer 2011). It was not the purpose or intention to include PE in the intervention, however this development is encouraging.



Conclusions and Recommendations

- Providing schools with a low-cost physical activity-friendly environment was found to be effective in increasing children's in-school MVPA in the short term.
- A relatively simple and cost effective intervention can stimulate the active play of children, and thereby make a beneficial contribution to increasing activity levels.
- An increase in the teaching of PE (as a result of the intervention), is an encouraging consequence of the project. Many disadvantaged schools have poor facilities and a paucity of equipment and resources, which discourages teachers and makes it difficult for them to do anything meaningful in relation to PE.
- The intervention produced the strongest effect on the younger children (Grade 3s). Feedback and interaction with older children is required to establish their needs and interests. In addition, it is recommended that the physical activity measurements be combined with direct observation to better understand the social context of children's play.
- In disadvantaged, historically black townships in South Africa, schools can, and should be, key sites for the promotion of physical activity.

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