



# “For whom was it effective?” Moderators of the effect of a school-based intervention on potential physical activity determinants among Brazilian students



Valter Cordeiro Barbosa Filho <sup>a,b,c,\*</sup>, Kelly Samara da Silva <sup>a</sup>, Jorge Mota <sup>c</sup>, Neiva Francenely Cunha Vieira <sup>b,d</sup>, Fabiane do Amaral Gubert <sup>b,d</sup>, Adair da Silva Lopes <sup>a</sup>

<sup>a</sup> Research Centre in Physical Activity and Health, Department of Physical Education, Federal University of Santa Catarina, Florianópolis, Brazil

<sup>b</sup> Research Centre in Physical Activity and Health in School, Institute of Physical Education and Sports, Federal University of Ceará, Fortaleza, Brazil

<sup>c</sup> Research Centre in Physical Activity, Health and Leisure, Faculty of Sport, University of Porto, Porto, Portugal

<sup>d</sup> Aids Project: Education and Prevention, Department of Nursing, Federal University of Ceara, Fortaleza, Brazil

## ARTICLE INFO

### Article history:

Received 21 July 2016

Received in revised form 9 January 2017

Accepted 17 January 2017

Available online 19 January 2017

### Keywords:

Motor activity

Associated factors

Socioecological theory

Obesity

Socioeconomic factors

Health and environment

Clinical trial

Vulnerable populations

## ABSTRACT

Knowledge about the effects of school-based interventions on modifiable physical activity (PA) determinants (e.g., social support), and whether the intervention effect differs according to students' characteristics (e.g., age and gender) are relevant PA promotion topics. This study aims to answer these topics among Brazilian students. This cluster-randomized controlled trial was conducted with 548 students in the intervention group and 537 in the control group (51.5% of boys; aged 11–18 years). The four-month intervention included strategies focused on training teachers, opportunities for PA in the school environment, and health education. Potential PA determinants (attitude, self-efficacy, support of friends, parents, and teachers, perceived neighborhood environment and PA facilities in school) and moderators (gender, age, socioeconomic status (SES), and PA level at baseline) were assessed using self-reported instrument. Height and weight were measured to estimate the students' body mass index (BMI) status. Generalized linear models were used. In general, there was a significant and positive intervention effect for attitude, support of friends and teachers for PA, as well as PA facilities in school; effect size was 0.29, 0.24, 0.34, and 0.29, respectively ( $P < 0.05$ ). Age (support of friends, parents and teachers, and PA facilities in school), SES (support of friends and PA facilities in school), and BMI status (support of friends) were moderators of the intervention effect on some outcomes. In conclusion, the intervention improved potential PA determinants, but some changes occurred differently according to students' characteristics. These findings should be considered in PA policies in the school context.

*Trial registration.* This study is registered at [Clinicaltrials.gov](http://Clinicaltrials.gov) NCT02439827.

© 2017 Elsevier Inc. All rights reserved.

## 1. Introduction

Promoting physical activity (PA), including at early ages, is a public health priority (World Health Organization (WHO), 2013). However, this priority has become a public health challenge because physical inactivity rates are high (around 80% of inactive students worldwide) (Hallal et al., 2012) and there is limited evidence of the effectiveness of PA-promoting interventions among young people, especially in low- and middle-income countries (Langford et al., 2014; Demetriou and Höner, 2012).

Many factors may contribute to PA practice during adolescence. Considering the socio-ecological perspective, modifiable PA determinants from intrapersonal (e.g., self-efficacy), interpersonal (e.g., social support) and environmental (e.g., perceived school environment) levels can affect the choice of a younger individual to be physically active or not (Ferreira et al., 2007; Perry et al., 2012; Sallis et al., 2008). Changing PA behavior is a complex process, and knowledge of the effectiveness of interventions on potential PA determinants can identify important influences that may pave the way for behavior change at a later stage, as well as avoiding the underestimation of important intervention effects (Bergh et al., 2012). Hence, potential PA determinants could be considered endpoints in themselves, (Perry et al., 2012; Brown et al., 2013; Salmon et al., 2009) and multicomponent interventions trend to be more successful in promoting PA whether positive changes occur on potential PA determinants from different levels (Ferreira et al., 2007; Sallis et al., 2008).

\* Corresponding author at: Universidade Federal de Santa Catarina, Centro de Desportos, Departamento de Educação Física, Campus Universitário – Trindade, 88040-900, Florianópolis, SC, Brazil.

E-mail address: [valtercbf@gmail.com](mailto:valtercbf@gmail.com) (V.C. Barbosa Filho).

Systematic reviews have shown little or inconsistent evidence of the effect of interventions on potential PA determinants based on a socio-ecological perspective, especially on interpersonal and environmental PA determinants (Demetriou and Höner, 2012; Perry et al., 2012; Brown et al., 2013; Salmon et al., 2009). Another relevant question is whether a feature of the target audience affects the direction and/or strength (i.e., moderator variable) of the intervention effect on PA determinants (Yildirim et al., 2011). Studies have reported that the practice and preference for PA can be different according to gender, (Perry et al., 2012; Brown et al., 2013; Salmon et al., 2009) age, (Demetriou and Höner, 2012; Cook et al., 2014) socioeconomic status (SES), (Yildirim et al., 2011; Grydeland et al., 2013) PA level, (Grydeland et al., 2013; Taymoori et al., 2008) and body mass index (BMI) status (Bergh et al., 2012; Grydeland et al., 2013). Consequently, these variables can also moderate the effect of an intervention on PA-related variables. However, studies on moderators of the intervention effect on potential PA determinants are rare (Demetriou and Höner, 2012; Bergh et al., 2012; Yildirim et al., 2011).

Answering the question “for whom was it effective?” can help to understand the specific groups of students in which interventions led to substantial changes on PA-related outcomes (Bergh et al., 2012; Yildirim et al., 2011). Expanding this taxonomy is fundamental to research and practice in PA promotion (Gubbels et al., 2014) and can provide knowledge of the need to target subgroups differently when designing and implementing interventions with young people.

We conducted a multicomponent school-based intervention (*Fortaleza sua Saúde* program) (Barbosa Filho et al., 2015) that was effective in promoting PA practice among Brazilian students (Barbosa Filho et al., 2016a). In this paper, we aimed to evaluate the effect of this intervention on potential PA determinants and whether gender, age, SES, nutritional status, and PA level at baseline were moderators of the intervention effect among students. We hypothesized that the intervention would be effective in improving potential PA determinants from different levels, however some changes could occur differently according to students' characteristics.

## 2. Methods

### 2.1. Study design and sample

This was a cluster-randomized controlled trial (school as a sample selection unit) that was detailed previously, including a flowchart of the study based on the Consolidated Standards of Reporting Trials recommendations (Barbosa Filho et al., 2015; Barbosa Filho et al., 2016a). The participation of the students involved in this study was authorized by the parent/guardian by signing the informed consent. The National Research Ethics System (protocol No. 17366313.9.0000.0121) approved this research project. This study is registered at [Clinicaltrials.gov](https://clinicaltrials.gov/ct2/show/study?term=NCT02439827) (NCT02439827).

This study was conducted in Fortaleza, in northeast Brazil. In 2014, all six full-time schools of the city that were linked to a national program called *School Health Program* were included. We performed a random selection of three schools to each condition (intervention or control). All schools were in areas with a low Human Development Index (HDI), a composite index ranging from zero to one - the closer of number one more developed is the neighborhood - based on life expectancy, education level and standard of living): 0.215, 0.341 and 0.443 for the intervention schools, and 0.170, 0.377 and 0.491 for the control schools (Instituto Brasileiro de Geografia e Estatística, 2010).

Eligible participants were 1272 students (639 in intervention and 633 in control schools) who were enrolled in 40 Grade 7 to 9 classes. Of these, 1182 students filled out the baseline measures (92.0% and 93.8% of eligible students from intervention and control schools, respectively) and 1085 completed the follow-up measure (response rate of 93.2% and 90.4% in intervention and control schools, respectively) (Barbosa Filho et al., 2015). Dropouts were similar to the participants

in all variables, except for age group, where dropouts were significantly older than participants ( $P < 0.01$ ) (Barbosa Filho et al., 2016a).

### 2.2. Intervention description

A detailed description of the intervention can be found in a previous publication, including a description of how the potential PA determinants were focused in intervention strategies (Barbosa Filho et al., 2015). In summary, the intervention was based on different theoretical aspects, including the socio-ecological theory (Sallis et al., 2008) and the concept of the Health Promoting Schools (Langford et al., 2014). The intervention schools had four main component strategies, and control schools had no intervention (Barbosa Filho et al., 2015).

The first component involved training and activities in the general curriculum. All teachers from the three intervention schools were invited to participate in training and to perform lessons in the classrooms that discussed active and healthy lifestyles. A four-hour training session was conducted at the beginning of the school semester regarding the relationship between health, school and academic performance. Teachers received a supplemental manual in order to help with classroom activities. In general, the activities performed in the classroom included text production, production and exposition of videos, posters and/or booklets (newsletters or flyers) on different health issues.

The second component included a four-hour physical education (PE) teacher-specific training conducted at the beginning of the school semester. A supplemental manual with lesson plans and handouts was also developed and distributed to teachers. All PE classes (20 classes with two PE lessons per week) during the semester were supported by an undergraduate PE student. In addition, poster and text material were produced by the students during the classwork or the homework.

The third component included opportunities in the school environment to engage in physical activity. Supervised 10 to 15 min sessions called “Gym in School” were performed twice a week. These sessions were composed of activities in small and large groups in order to involve young people in PA during free-time at school. A staff member conducted these sessions in a variety of open spaces in the school (e.g., courtyard or court). Space and equipment were structured and made available for playing games during free-time in the school day. All games were supplemented by banners displayed in schools that explained the game rules and how to access equipment.

The last component involved health education in the school community. The materials produced in the classroom and PE classes (e.g., posters, newsletters and flyers on health issues) were available in schools. In addition, pamphlets were directed at students and parents. The pamphlets were delivered to a member of the school administration (coordinator or director), and they were delivered early in the school day, during classes, and parent/teacher meetings in school.

### 2.3. Variables

We used a previously validated instrument to measure eight potential PA determinants (see Supplementary Material A) (Barbosa Filho et al., 2016b). The scales of attitude (five items) and self-efficacy (eight items) for PA practice evaluated intrapersonal PA determinants. The scales of interpersonal PA determinants included social support of friends (five items), parents (six items) and the school's teachers (five items) for PA practice. The scales of environmental PA determinants evaluated the youth's perception of neighborhood safety, PA facilities in the neighborhood (five items each) and PA facilities in school (three items).

Potential moderators were measured at baseline using self-reported instruments. SES was represented by the instrument of the Brazilian Association of Research Companies (*Associação Brasileira das Empresas de Pesquisa*, 2013). This instrument puts subjects into groups economic class groups based on a score combining ownership of assets, parents' schooling and the number of employees in the household. The

Download English Version:

<https://daneshyari.com/en/article/5635797>

Download Persian Version:

<https://daneshyari.com/article/5635797>

[Daneshyari.com](https://daneshyari.com)