



## HEALTH PROMOTING SCHOOLS; interventions and strategies to increase physical activity: Review and recommendations.

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### Abstract

*Prevalence of childhood obesity and health problems resulting from a lack of physical activity are in a position to increase in most developed countries. Scientific evidence of the relationship between physical activity levels and health problems resulting from inactivity not fully studied. Levels of physical activity for young people and teenagers are insufficient. There is little evidence of positive results in relation to interventions with children. In general, interventions achieved significant changes in physical activity levels of approximately 13% in moderate and vigorous physical activity. Most interventions are not significant in children although teenagers. In the case of children is effectively a direct influence over the type of physical activities that are proposed, with a high recreational component and multicomponent interventions course include families and supporting institutional campaigns. For adolescent interventions must also be multicomponent and focus on environmental intervention center to have some assurance of effectiveness.*

**Key words:** School-based, interventions, physical activity, children.

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### Introduction

The prevalence of childhood obesity and health problems resulting from a lack of physical activity are in a position to increase in most developed countries and the growth forecast by 2010 is increasing, [29].

Scientific evidence of the relationship between physical activity levels and health problems resulting from inactivity (weight gain, metabolic diseases, obesity, stroke, etc.) is not fully studied [2, 25], although in the current effort to stop or minimize the growth of the epidemic of childhood obesity is clear that the promotion of physical activity in order to increase the level of this, it is proposed as a key tool agreed by all [13].

Currently no evidence that levels of physical activity for youth and adolescents is insufficient (a far cry from the 60 minutes of physical activity of medium and high intensity, journals recommended by the ACSM American College of Sports Medicine in its 2008 recommendations) and low levels of physical activity are maintained into adulthood, this makes physical inactivity

among children younger i a risk factor for cardiovascular disease, cancer, osteoporosis, etc.. at later ages. The development of initiatives to promote physical activity in general is a priority and should be of particular school. The education system, social customs and the evolution of the consumer society, we have bequeathed a sedentary society and schools must act contributing their bit to promote the practice of AF, and certainly not from the Education Physical exclusively, but as center work, as content transversal part of the health education (EPS).

The worldwide network of health promoting schools, like the European network of health promoting schools give some coverage to these initiatives, but will always be schools, within the possibilities of their local environment, which must act.

There are many interventions in schools to promote the practice of physical activity in the next review we present those considered most significant.

## METHOD

The method consists of a systematic review of interventions to promote physical activity in children and adolescents using six electronic databases (PubMed, Psychlist, SCOPUS, Ovid Medline, and Embase SportDiscus), including revisions through December 2012. The search strategy focused on four key elements: population (children, youth, and adolescents), type of study (randomized, intervention case studies ...), type of behavior (physical activity, walking, exercise) and intervention (health education, behavior change).

### Inclusion Criteria

The studies in this review will focus on include the following studies published in peer review journals:

Studies in children and adolescents (below 18 years), interventions where the main component of the intervention was the promotion of physical activity and the increase in their practice.

A total of 57 studies entered the inclusion criteria were excluded from the study specific interventions that could contain physical activity, such as specific interventions for the prevention and treatment of childhood obesity, and were also excluded interventions intervention did not include a control group.

### Data Analysis

Data extraction was divided into two different groups, elementary school children (<12 years) and high school adolescents (> 12 years)

### Level of efficacy

5 were developed efficiency levels, high, moderate, limited low and no efficacy.

## RESULTS

3045 studies were surveyed (n = 2000 PubMed, Pshycinfo n = 340, n = 692 scopus, Ovid Medline n = 591, n = 472 SportDiscus, Embase n = 400). Of these 51 met the inclusion criteria and six more were added after consulting references. Of these 33 concerned 24 children and adolescents included.

### Characteristics of studies

Most studies were conducted in the United States some in the UK and the rest in different countries of the European Union, most of the

studies done in children evaluated 14 of them school interventions included a component of family or community, approximately half of the interventions were educational, about a third were multicomponent (involved in more than one area) most used physical activity questionnaires completed by themselves or by parents, only 12 studies used objective measures and only 5 of them evaluated the daily physical activity with accelerometers or heart rate monitors, the other assessing physical activity alone in the school schedule.

### Interventions in Children

Here are some of the most representative studies from the review:

Rosenkranz [15], USA, SNAP (Scouting Nutrition & Activity Program). Interactive educational curriculum focus on nutrition and PA delivered by trained troop leaders as part of regular troop meetings (twice a month)

Jones [8], USA, 18 month intervention. 10-min warm-up of high impact activities during regular PE classes. A peer based behavioral journalism with role model stories.

Spruijt-Metz [19], USA, "Get Moving", classroom media intervention in wich teams of 7-10 children were asked about presenting a commercial supporting PA engagement.

Barbeau [2], USA, After-school program offered daily. Subjects wore heart rate monitors to maintain heart rate above 150 bpm.

Christodoulos [4], in Greece, made an intervention one year. Includes two weekly PE classes and theoretical activations three minutes on physical activity and health, working class containing physical activity, the primary class teachers were trained and included in the curriculum also included family activities encouraging to participate in physical activities.

Yancey [27], in Ireland, makes a 16-week intervention on people of low socioeconomic status. The intervention consists of 10 sessions of 30 minutes focused on minimizing the TV and computer time, and increase the level of physical activity. The intervention in school takes place in hours of tutoring, the control group is charged the normal curriculum.

Verstraete [23] in Belgium, proposed an environmental intervention, seeking dead material in school periods (before and after

dining, periods before and after entry to school etc.

French [6], in the U.S., is implementing a two-year intervention with 10 sessions lasting 90 minutes each year based on calcium-rich food choices and physical activity aimed at weight control, the operation is performed on girls only

Palmer [9], in the U.S., made an intervention of one month in a web based interactive content from cardio vascular disease prevention, physical activity, smoking etc. 2 sessions a week in the computer room of the center

Stratton [20] in the UK, other environmental interventions, undertaken to increase the level of physical activity by providing sports equipment and painting the school playgrounds during recess (recess)

Pangrazi, [10], in the U.S., with a population of 606 subjects underwent. Program (PLAY). Duration 12 weeks, 15 minutes a day of physical activity led, after school, intervention teachers to invigorate children to be physically active

Van Beurden, [22] in Australia, is the largest ever with 1045 subjects underwent. The duration is one year and consists of five strategies to stimulate teachers to encourage children to practice physical activity

The oldest of the review but probably the most famous. Sallis [16] in USA, SPARK program. Increased physical education, personalized information sessions for students, homework, involvement of parents through brochures etc.

### **Interventions in adolescents**

Here are some of the most representative studies from the review:

Arday [1], in Spain, included 2 extra sessions of Physical Education weekly, the results in fitness improvements 20-34%, no physical activity was assessed in this intervention.

Dudley [5], in Australia, six 90-min sessions delivered during school sport time. Enjoyable, challenging and new activities (yoga, pilates, dance) with commercially purchased instructional videos.

Webber [24], USA, TAAG, Trial of activity for adolescent girls. Physical education teachers

were trained to provide at least 50% of their classes in high intensity exercise. Incentives given to participants.

Sneider [18], USA, project FAB II (fitness and Bone). PE classes five days a week, plus supervised PA four days a week, aerobic and strength building activities.

Jago [7], in the U.S., has a 9-week intervention period with a weekly session and intervention via the Internet where subjects initiated session twice a week, the main objective is the dissemination of possibilities of physical activity, goal setting, meetings with partners for physical activity and a weekly physical activity directed.

Robins [14], the U.S. made an intervention aimed at women "Girls on the move". A 9-week program with three weekly sessions controlled by computer controlled by the school nurse. Parents were operated through brochures.

Young [28], made in the USA a multicomponent intervention. During a school year group discussions, homework activities, monitored physical activity with accelerometers during physical education classes to maximize the impact on the level of weekly physical activity. Families participated in a workshop on family strategies to increase the level of AF.

Pate [11], raises a number of interventions carried out in a program with 2744 subjects in the LEAP program "life education programm activity". It is based on a multicomponent intervention for adolescents to experience positive physical activities. Change of school physical education with a streamlined component of health education, creating a conducive school environment, school health services and family activities.

French [6] made a speech on the Internet 8 sessions in science class, record control with daily physical activity.

Tsorbatzoulis [21], in Greece, offers a 12-week intervention, three sessions per week plus encouraging behavior change theory sessions of 45 minutes in goal setting.

Prochaska [12], in the U.S., made an intervention of 30 minute sessions of health education with individualized plans to develop activities that included increasing daily physical activity.

Sallis [17] proposed a two-year intervention period based on an ecological model of physical activity and nutrition. The intervention included the change in structure of the physical education subject content specific health education through physical activity, increased choices and physical activity during recess periods and time between sessions, free use equipment, etc.

## DISCUSSION

We note that there is little evidence of positive results in relation to interventions with children. In general, interventions achieved significant changes in physical activity levels of approximately 13% in moderate and vigorous physical activity.

It is interesting to note that in the case of children interventions at household or community level were unsuccessful, it appears that interventions useful in this age focus on the work

of equals and that the focus is physical activity itself, looking intrinsic motivation on task and using a communication style by the teacher based on the task and not the result, making fun classes and offering games and activities for leisure time feasible and fun.

There was much more evidence of the effects of interventions on adolescents, on the one hand many of the studies with larger samples were teenagers. Furthermore it is known that adolescents are more sedentary than boys, as it produces a large part of sport dropout at that age, and the margin of improvement is much larger.

Unlike young children if they are susceptible to educational interventions based on health education and can sense a certain rationalization of work for the future, and community-based interventions and multicomponent were significant.

Table 1. - Summary of levels of effectiveness of interventions to promote physical activity in children and adolescents stratified by location, type of intervention and target group.

VARIABLES	Children (33)		Adolescents (24)	
	Nº of studies	Efficacy level	Nº of studies	Efficacy level
<i>Type of Intervention</i>				
Educational	19	No	17	No
Environmental	4	<b><i>Limited</i></b>	1	low
Multicomponent	10	low	6	<b><i>High</i></b>
<i>Place</i>				
School	13	low	14	Low
School + family	14	low	6	<b><i>High</i></b>
Family	4	No	1	low
Community	2	No	1	low
Primay care setting	0	No	2	low
<i>Intervention Group</i>				
unisex	5	No	9	low
Ethnic minority	10	No	0	No
Low SES <sup>1</sup>	3	low	2	low

<sup>1</sup>SES. Socio-economic status

Notably, the children's physical activity responds to a different pattern than adolescents. Children are intermittent while adolescents are more structured and planned. Thus, traditional cognitive approaches to design interventions combined with environmental changes increase

the activity in adolescents while structural changes and changes in educational policies will be more effective in children.

## CONCLUSIONS

There are many policy recommendations to act against the huge lack of physical activity in the general population and the child population in particular, and there are many institutions and states that are pursuing policies to promote physical activity. The main example is the WHO global strategy [26], for diet, physical activity and health, which has been the benchmark for the majority of UN states began promotion strategies activity physics at all levels.

The main problem is that there is still much evidence of the effectiveness of interventions and the parameters that must be adjusted.

If we rely on published scientific evidence on the effectiveness of school-based interventions to promote physical activity among children and teenagers can see that most interventions are not significant in children although teenagers.

It appears that interventions were successful pass through a measure of physical activity more objectively (accelerometers for a week), and in the case of children a direct influence over the type of physical activities that are proposed, with a high recreational component and of course multicomponent interventions that include families and supporting institutional campaigns. Interventions need of coordinated projects from schools and initiatives not only give the area of physical education.

For adolescent interventions must also be multicomponent and focus on environmental

intervention center, providing materials and sports equipment during periods of recess and downtime school (before and after dining etc.).

### Recommendations for intervention

- Designing a good strategy for measuring physical activity level of the school (questionnaire, more objective measures, etc.).

- Propose formats interventions innovation or improvement projects which involve center all areas of the curriculum and not just be working from the specific time of class (teachers and professors are too saturated transverse Content)

- Identify potential environmental interventions at the middle (healthy eating, walking trails or bike trails to come to the center from nearby environments, adaptations specific material for recess periods and downtime from school-related extracurricular activities encourage physical activity, etc.

- Redefine the subject of physical education as a part of health education through physical activity, keeping the games, in primary and secondary instructional.

- Relate the school health center their surroundings and establish specific lines of cooperation in promoting physical activity

- Establish intervention strategies for families (lectures, brochures etc.)

- Participate in SHE projects, European Network of Health Promoting Schools ([www.schoolsforhealth.eu](http://www.schoolsforhealth.eu))

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