

Perceptions of a School-Based Self-Management Program Promoting an Active Lifestyle Among Elementary Schoolchildren, Teachers, and Parents

Greet Maria Cardon, Leen Liesbeth Haerens,
Stefanie Verstraete, and Ilse de Bourdeaudhuij
Ghent University

The present study aimed to investigate how classroom-based self-management lessons to promote physical activity were perceived by students, teachers, and parents. The self-management lessons were implemented by an external physical education specialist in 20 class groups at eight elementary schools. Program perceptions were evaluated in 412 children (mean age 9.7 ± 0.7) using a short questionnaire. Oral surveys were used with 20 teachers and 50 parent participants. Most children were enthusiastic about the program and more than half of them reported being more active. Teachers and parents also perceived the lessons as useful and half of them reported an improvement in children's physical activity awareness. Eighty percent of the teachers and 32% of the parents perceived an increase in children's physical activity levels. The SPARK self-management physical activity program appears to promote an active lifestyle in children and was positively received; the implementation of the program by the teachers needs further evaluation.

Keywords: health promotion, intervention, physical activity

Regular physical activity is an important component of a healthful lifestyle in children and adolescents (Cavill, Biddle, & Sallis, 2001; Harsha, 1995). Although children are more active than adults, a substantial proportion of young people have lower activity levels than those desirable for good health (Biddle, Gorely, & Stensel, 2004). It is well documented that physical activity levels decline from childhood into adulthood (Pate et al., 2002; Riddoch et al., 2004; Roberts, Tynjälä, & Komkov, 2004; Trost et al., 2002). Furthermore, tracking studies have revealed that low levels of physical activity remain stable from adolescence into adulthood (Lefevre et al., 2000; Malina, 1996). Therefore, all young people should be encouraged to participate in physical activity of at least moderate intensity for 1

hr per day, and the importance of lifelong physical activity should be emphasized at an early age (Cavill et al., 2001; NASPE, 2004).

Schools are ideal settings for the promotion of lifelong physical activity because most children can be reached. At school, opportunities for children to be physically active can be provided during physical education classes, during class hours (activity breaks), during recess periods, and before/after school hours (extracurricular activities). In addition, teachers can teach children the behavioral skills necessary to develop and maintain an active lifestyle.

Many programs to modify health behavior are based on the social cognitive theory (Bandura, 2004) and self-regulation models of behavior change (Kanfer & Gaelick-Buys, 1991). Self-management programs mostly combine techniques that involve the three basic processes of self-regulation, namely self-monitoring, self-evaluation, and self-reinforcement (Kanfer & Gaelick-Buys, 1991; Karoly & Kanfer, 1982). Self-management has frequently and successfully been used in the treatment of chronic diseases such as diabetes and asthma (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Wright, Barlow, Turner & Bancroft, 2003). Self-management techniques are further used in primary prevention programs because cognitive-behavioral techniques might be a more effective approach to facilitate behavioral changes than only providing knowledge (Douthitt & Harvey, 1995). With regard to physical activity, self-management strategies were found to be directly related to physical activity levels among girls. These strategies further mediated the relationship between self-efficacy and physical activity levels in girls (Dishman et al., 2005). A number of physical activity promotion intervention studies in elementary schools have included classroom curricula in which some aspects of self-management were taught (Nader et al., 1999; Simons-Morton, Parcel, Baranowski, Forthofer, & O'Hara, 1991). The Sports Play and Active Recreation for Kids (SPARK) program of San Diego State University includes self-management lessons as a part of a comprehensive physical activity promotion program for elementary schools (Sallis et al., 1997). The SPARK self-management program promotes physical activity out of school by teaching children cognitive and behavioral skills necessary to develop and maintain an active lifestyle (Marcoux et al., 1999).

In Europe, the promotion of lifelong physical activity within the school context has received a great deal of attention during the last decade. In several European countries, the promotion of a physically active lifestyle has recently been recognized as an important mission of physical education (Almond & Harris, 1998; Cardon & De Bourdeaudhuij, 2002; Harris, 2005), and there has been a greater emphasis on health-related activities in the physical education curriculum (Almond & Harris, 1998; Harris, 2005). Classroom-based self-management lessons promoting lifelong physical activity, however, are a new concept in Europe. Existing health curricula of elementary schools mostly include health topics such as nutrition, dental hygiene, and drugs prevention, but not physical activity promotion. However, because the development of an active lifestyle implies behavioral change and the scheduled lesson time for physical education is often too limited to add specific behavioral change skills (such as goal setting), the implementation of self-management lessons in classrooms also seems useful for Euro-

pean schools. Hence, adapting the SPARK self-management program of the United States to the European educational system and culture may be a promising avenue to further promote lifelong physical activity among European children. In the current study, this was done during the first year of a comprehensive physical activity promotion intervention implemented over two school years in 20 class groups at eight Flemish elementary schools (Verstraete, Cardon, De Clercq, & De Bourdeaudhuij, 2006, 2007b).

The self-management program was delivered by an external physical education specialist in the classroom setting. Besides the self-management program, the intervention also included using the SPARK health-related physical education curriculum at the participating schools and an extracurricular physical activity promotion program. The comprehensive physical activity promotion intervention resulted in increased physical activity levels at school and in leisure time, during physical education classes and during recess periods (Verstraete et al., 2006, 2007a, 2007b).

Results of the comprehensive SPARK self-management program revealed that some teachers perceived the actual implementation in their class as difficult, discouraging them from completing the program. This emphasized the importance of teachers' acceptance and enthusiasm about the program for an effective implementation and sustainability.

Hence, the purpose of the current study was to investigate a sample of European children's, teachers' and parents' receptiveness to the culturally adapted SPARK self-management lessons, along with perceptions of the impact of the program on children's physical activity awareness and activity levels.

Methods

Participants

Participants for the current study were children, teachers, and parents from eight schools participating in a comprehensive physical activity promotion intervention project (Verstraete et al., 2006, 2007a). For the larger study, 16 elementary schools were randomly selected from all of the elementary schools in East Flanders ($N = 486$). These schools were then randomly assigned to an intervention ($n = 8$) or control condition ($n = 8$). Only intervention schools were included in the present self-management study. The entire procedure is more fully described elsewhere (Verstraete et al., 2006, 2007a).

This study's population included 20 class groups of fourth- and fifth-grade children (203 boys, 209 girls, mean age 9.7 ± 0.7 years) from the eight schools. All 502 pupils participated along with the 20 classroom teachers (6 men, 14 women) and 50 of the parents (5 men, 45 women). The parents were randomly selected from three of the participating schools. All potential pupils, teachers, and parents asked to participate agreed to take part. The evaluations were considered to be part of the psychological, medical, and social counseling provided by the school, for which all parents signed a consent form. The study protocol was approved by the Ethics Committee of the university.

Measurements

The self-management lessons (see Table 1) were implemented during the first intervention year of the 2-year comprehensive physical activity promotion intervention program. Hence, the evaluations of participants' receptiveness of the program (with children, teachers, and parents) were performed at the end of the first intervention year, to reduce bias due to recall problems. Children completed a paper and pencil questionnaire in the classroom. The questionnaire was based on a reliable questionnaire used to evaluate the perception of a back education intervention program in the same age group (Cardon, De Bourdeaudhuij, De & Clercq, 2002). For the questionnaire used in the current study, test-retest reliability was determined by one class of children ($n = 27$) completing the questionnaires twice within a 1-week interval. For all items in the questionnaire, single measure ICCs significantly (all $p \leq 0.01$) ranged between 0.46 and 0.79. A trained research staff member remained in the classroom during questionnaire administration and gave instructions on how to complete the questionnaire. Oral surveys for teachers and parents were also conducted by a research staff member. Surveys with classroom teachers were conducted at school, and surveys with parents were conducted by telephone. The surveys for teachers and parents were based on the questionnaires used for the process evaluation of the SPARK self-management program (Marcoux et al., 1999). All questionnaires were reviewed by three experts in the program to ensure content validity.

Questionnaire for Children. The paper questionnaire for children consisted of 9 questions (Cronbach's $\alpha = 0.79$); all rated on a 4-point Likert-like scale (see Table 2). The first three questions were related to their perceptions of the self-management lessons. Two questions on the perception for each of the two homework tasks were included. The final two questions were related to the levels of physical activity during recess periods or at home.

Oral Survey With Teachers. The oral survey with teachers consisted of dichotomous questions with yes or no as an answering option (see Table 3). One question was related to the perception of the total of the self-management lessons. Furthermore, for each of the seven physical activity self-management lessons, classroom teachers were asked if they perceived it useful or not. The survey ended with four questions about the program.

Oral Survey With Parents. The oral survey with parents consisted of six dichotomous questions with yes or no as an answering option about the self-management program and their child (see Table 4).

Intervention

The self-management lessons evaluated in the current study were based on the self-management program of the SPARK curriculum (Sallis et al., 1997; Marcoux et al., 1999). The original self-management program was designed to promote generalization of physical activity out of school by teaching fourth- and fifth-grade children cognitive and behavioral skills such as goal setting, self-monitoring, self-reward, self-talk, activity planning, and problem solving.

Table 1 Main Subjects and Homework Tasks of the Self-Management Lessons Taught

Lesson	Main Subject	Homework Task
Lesson 1	Introduction: benefits of being active, meaning of PA and sports and the difference between the two, possibilities to be active at school and at home.	Record personal reasons and parents' reasons to be active on a checklist.
Lesson 2	Safety during PA / Goal setting: what is a good activity goal.	Record current PA engagement during a week on an activity sheet.
Lesson 3	Goal setting: setting personal activity goals / Problem solving: solving problems that make it harder to reach the activity goals / to be physically active (overcoming barriers).	Set PA goals to increase PA at school and at home on a goal sheet (= goal setting).
Lesson 4	Scheduling: learning techniques for scheduling personal activity engagement.	Goal setting.
Lesson 5	Self-talk: how can self-talk be used to enhance personal activity engagement.	Goal setting.
Lesson 6	Quiz: repetition of the previous lessons.	Goal setting.
Repetition Lesson 1	Activity breaks: problem solving—techniques for staying active during the vacation or being active again after a “break.”	Record PA engagement and goal attainment on the “activity card” (= activity card).
Repetition Lesson 2	How can other people (family and peers) influence someone’s activity engagement (positive, negative, habit) (social support and peer pressure).	Activity card.
Repetition Lesson 3	Signs: creating personal reminders to increase PA engagement at home. Summer planning: staying active during the summer.	Activity card.

Note. PA = physical activity.

Table 2 Gender Differences in Children's Program Evaluation and Correlations Between Program Evaluation and Age

Questions	Response Options	Boys (<i>M</i> ± <i>SD</i>)	Girls (<i>M</i> ± <i>SD</i>)	<i>t</i>	Pearson <i>r</i>
I perceived the self-management lessons as:	Certainly (1) to Certainly Not pleasant (4)	2.21 (0.84)	2.00 (0.75)	2.71**	0.18**
	Certainly (1) to Certainly Not interesting (4)	2.06 (0.71)	1.96 (0.69)	1.44 (<i>p</i> = .15)	0.17**
	Certainly (1) to Certainly Not important (4)	2.03 (0.71)	1.84 (0.74)	2.61**	0.11*
Are you now more active during recess periods?	Certainly Yes! (1) to Certainly No! (4)	2.37 (0.94)	2.27 (0.84)	1.10 (<i>p</i> = .27)	0.11*
Are you now more active outside of school?	Certainly Yes! (1) to Certainly No! (4)	2.32 (0.89)	2.23 (0.87)	1.04 (<i>p</i> = .30)	0.01 (<i>p</i> = .77)
I perceived the PA homework tasks as:	Certainly (1) to Certainly Not pleasant (4)	2.37 (0.86)	2.16 (0.79)	2.57**	0.07 (<i>p</i> = .19)
	Certainly (1) to Certainly Not difficult (4)	1.76 (0.70)	1.76 (0.70)	-0.37 (<i>p</i> = .71)	0.01 (<i>p</i> = .94)

Note. PA = physical activity, Likert-like scale ranged 1–4.

p* < .05, *p* < .01.

Table 3 Teachers' Perceptions of the Self-Management Program

Questions	% yes
Did you perceive the total of self-management lessons as useful for the children?	95.0
Did you perceive the following lesson subjects as useful?	
1. Benefits of being active / Meaning of PA and sports and the difference between the two / Possibilities to be active at school and at home.	90.0
2. Goal setting: what is a good activity goal.	75.0
3. Goal setting: setting personal activity goals / Problem solving: solving problems that make it harder to reach the activity goals or to be physically active (overcoming barriers).	70.0
4. Scheduling: learning techniques for scheduling personal activity engagement.	65.0
5. Self-talk: how can self-talk be used to enhance personal activity engagement.	90.0
6. Activity breaks: problem solving—techniques for staying active during the vacation or being active again after a “break.”	85.0
7. How can other people (family and peers) influence someone’s activity (positive, negative, habit) (social support and peer pressure).	85.0
Did you support the PA homework tasks?	80.0
Did you perceive an improvement in children’s PA awareness (for example, children were more conscious about the importance and benefits of PA)?	55.0
Did the children increase their activity at school during the time that the lessons were given?	80.0
Are you willing to teach the self-management lessons yourself?	70.0

Note. PA = physical activity, *N* = 20.

Table 4 Parents' Perceptions of the Self-Management Program

Questions	% yes
Did you receive and read the letter concerning the self-management lessons?	96.0
Did you think such lessons are useful?	96.0
Were you informed about the PA homework tasks?	83.0
Did you support the PA homework tasks?	88.0
Did you perceive an improvement in children’s PA awareness of the importance of being physically active (for example, children were more conscious about the importance and benefits of PA)?	56.0
Was your child more physically active at home while the self-management lessons were given?	32.0

Note. PA = physical activity, *N* = 50.

In the current study, the self-management lessons were implemented along with the existing health promotion curriculum over one school year. Between October and January, six lessons of 50 min were provided with a 1-week interval. Between February and June, three 50-min repetition lessons were provided at 2-month intervals. As in the SPARK guidelines (Marcoux et al., 1999), the lessons in the present program were also taught in an interactive fashion and each lesson

began with a brief review of the skills or information presented during the previous lesson and a discussion of the children's homework. After the repetition, one or two new subjects were presented. At the end of the lesson, the teacher explained children's homework for the next week or month.

For the intervention in the current study, some adaptations were made to the SPARK self-management program to meet the needs of the educational system and culture of Belgium (Flanders). In the SPARK self-management program, lesson topics included both physical activity and nutrition subjects and each lesson contained one topic. In the present program, only topics about physical activity were taught because lessons about nutrition were already present in the existing health promotion curriculum. In the regular SPARK program, 31 lessons are taught in weekly 30-min classroom sessions over one school year. In the present program, nine 50-min lessons were implemented along with the existing health curriculum over one school year. Hence, some lessons included more than one new topic because the scheduled lesson time was longer. In addition, in the standard SPARK program the lessons are typically taught by the classroom teachers. In the present program, lessons were taught by an external physical education specialist who was a member of the research team because the goal of the current study was to investigate the receptiveness of pupils, parents, and teachers to the self-management lessons and because teachers in the current study were not yet trained to teach content in physical activity promotion. Classroom teachers were asked to be present during the lessons because they were expected to teach the lessons in the future. Furthermore, based on the classroom teachers' less positive evaluation of the reward system in the SPARK program, no eccentric reward system for being active was included in the present program. Finally, the United States-oriented examples and trigger situations used in the lessons were adapted to the European context to enhance the relevance of the program.

As in the SPARK program (Marcoux et al., 1999), the present program included physical activity homework tasks regarding goal setting to increase physical activity levels. During the first six lessons, children set physical activity goals each week to increase their physical activity at school (during recess periods and lunch break) and at home. For their physical activity goals at school, they could choose any activity allowed on the playground. For their physical activity goals at home, the children could choose from a group of "lifetime activities" (walking, jogging, swimming, skating, dancing, cycling, rope skipping). These activities were chosen because they are not expensive, they do not require the participation of others, and they can also be carried out during adulthood. After setting their physical activity goals for the week, children self-monitored on the homework sheet if they performed their activity goals or not during the week. During the repetition lessons, children received an *activity card* to increase their physical activity at home. Children recorded on their activity card every time they were physically active for 20 min or more during each week of the month. Their goal was to be active at least five times a week for a minimum of 20 min. Even though the repetition lessons were given with an interval of 2 months, children received homework every month. After 1 month, children brought the activity card back to school and discussed their activity with the teacher. Table 1 presents the main subjects and physical activity homework tasks of the self-management lessons taught.

Before the start of the lessons, parents were informed by a letter about the purpose and the content of the lessons and the homework tasks. The importance of family support was also emphasized in the letter and parents were asked to support their children in physical activity endeavors. Furthermore, one parent had to sign the physical activity homework task, and children were instructed to discuss their activity goals with their parents to stimulate parental support for physical activity.

Data Analysis

All data were analyzed using SPSS for Windows (12.0). Descriptive statistics were used to evaluate the perceptions of the self-management lessons among children, teachers, and parents. Additional analyses consisted of calculating Pearson correlation coefficients to evaluate the relationship between children's age and their program perceptions. Independent samples *t* test analyses were also used to investigate possible gender differences in the program perceptions. The alpha level was set at 0.05 for all analyses.

Results

With regard to the self-management lessons, 76% of the children evaluated the lessons as pleasant to very pleasant; 83%, as interesting to very interesting; and 83%, as important to very important. The physical activity homework tasks were perceived as pleasant by 67% of the children, and 88% evaluated the tasks as not difficult. During recess periods, 61% of the children reported an increase in their activity level, and during out-of-school time 63% reported an increase in their activity levels. Family support to be physically active was reported by 47% of the children.

The gender and age differences in children's program evaluation are presented in Table 2. Compared with boys, girls found the lessons significantly more pleasant ($t_{(410)} = 2.7, p < .01$) and more important ($t_{(410)} = 2.6, p < .01$). Furthermore, girls liked the physical activity homework tasks ($t_{(410)} = 2.6, p < .01$) significantly more than did the boys. No gender differences were found for children's perceived activity levels during recess periods ($t_{(410)} = 1.1, p < .27$) or out of school ($t_{(410)} = 1.04, p < .30$) or for the difficulty of the homework tasks ($t_{(410)} = -0.37, p < .71$). Pearson correlation coefficients indicated that age was significantly related to perception of the self-management lessons. Younger pupils had significantly higher perceptions of pleasantness ($r = .18, p < .01$), interestingness ($r = .17, p < .01$), and importance ($r = .11, p < .05$). Age was also significantly positively related to "perceived increase in activity levels during recess periods" ($r = .11, p < .05$).

Table 3 presents teachers' perceptions of the self-management program. In general, most (i.e., 95%) of the teachers perceived the self-management lessons as useful for the children. Lessons about the importance of physical activity, the possibilities to be active, and self-talk were perceived as useful by 90% of the teachers. The lesson about planning time (scheduling) was perceived as useful by 65% of the teachers. Half of the teachers (55%) reported that physical activity awareness was improved in most of the children. Eighty percent of the teachers reported that most children increased their activity level at school. The physical activity

homework tasks were supported by 80% of the teachers. Finally, 70% of the teachers reported that they would be willing to teach the lessons themselves.

Table 4 presents parents' perceptions of the self-management program. Most of the parents (i.e., 96%) received and read the information letter at the beginning of the school year and perceived the extra focus on physical activity at school as useful. With regard to the physical activity homework tasks, 83% of the parents were informed about the tasks and 88% supported the tasks. An increased physical activity awareness in the children as a result of the lessons was reported by 56% of the questioned parents, and 32% reported increased activity levels of their child out of school.

Discussion

The aim of the current study was to investigate the perceptions of self-management lessons promoting an active lifestyle among children, classroom teachers, and parents and to evaluate their perceptions of the impact of the self-management lessons on children's physical activity awareness and activity levels.

In general, the results indicated that the self-management lessons were well perceived by the children, classroom teachers, and parents. Most children were enthusiastic about the program and perceived the lessons as pleasant, interesting, and important. This is a significant study finding because according to several health-promoting models, such as the attitude, social influence, and self-efficacy (ASE) model, positive attitudes toward a health promotion program may exert a positive influence on behavioral change (De Vries, Backbier, Kok, & Dijkstra, 1995; De Vries, Dijkstra, & Kuhlman, 1988).

Among children, age was related to the receptiveness of the program. The program was better received by younger children. Hence, there is a need to search for specific lesson topics and lesson examples that will better trigger the interests of older children. Compared with those of boys, girls' perceptions of the self-management lessons were more positive. Because girls are typically at risk for low activity levels (Biddle et al., 2004; Riddoch et al., 2004), this is an important finding from a public health perspective. A possible explanation could be that girls are more attracted to health-related topics than boys are—a finding similar to the Vandongen et al. (1995) gender study. Nevertheless, additional attention may be needed to enhance boys' enthusiasm for the program.

Almost all classroom teachers perceived the overall self-management program as useful. However, the lessons about goal setting and scheduling were perceived as less useful compared with the lessons about the importance of physical activity (introduction lesson) and self-talk. Furthermore, 14 of the 20 teachers indicated that they would be willing to teach the lessons themselves. These findings suggest that the teachers were receptive to the program. Previous studies showed that the implementation of health education programs were poor when teachers were not receptive to the program, implying that teachers' enthusiasm about the program is an important condition for a good implementation (Cardon, De Bourdeaudhuij, & De Clercq, 2001; Resnicow, Robinson, & Frank, 1996). However, it is unknown if teachers' enthusiasm in the current study would be similar if they had to implement the lessons themselves.

Although the overall perception of the lessons by the teachers was positive, the evaluation of the SPARK self-management lessons revealed that the teachers perceived some difficulties in the actual implementation of the lessons (Marcoux et al., 1999). Therefore, it will be important to inform classroom teachers about the importance of teaching behavioral skills to promote lifelong physical activity and to train them how to teach behavioral skills through in-service programs.

As in the United States, in most European countries using physical activity-based homework tasks is a new concept. Children receive homework for most school subjects (such as mathematics, language) but not for physical activity or physical education. In the current study, the physical activity homework tasks were well received by the children and most of the classroom teachers and parents. The physical activity homework tasks included goal setting to increase children's physical activity levels. Because physical activity homework tasks can increase children's awareness of the importance of daily physical activity engagement and goal setting, it can help them to develop an active lifestyle; thus, physical activity homework tasks need to be encouraged in Europe. Furthermore, parental involvement can be stimulated through physical activity homework tasks.

The self-management lessons were designed to increase children's physical activity awareness and to promote regular physical activity away from school by teaching the children behavioral skills. An improvement in children's physical activity awareness as a result of the lessons was reported by half of the teachers and by half of the parents. The self-report data indicated that more than half of the children perceived being more active at school and at home as a result of the lessons. Most teachers reported an increase in children's physical activity levels at school when the lessons were given, whereas only 32% of the parents perceived an increase in children's activity levels at home as a result of the lessons. These results were in line with a previous SPARK self-management program study, revealing that 70% of the parents reported no increase in children's out-of-school physical activity as a result of SPARK (Marcoux et al., 1999). From the current study results, it seems that the classroom-based self-management lessons were more successful in promoting children's physical activity at school than at home.

According to the literature (Biddle et al., 2004; Sallis, 1998), family involvement in the promotion of leisure-time physical activity is recommended because the family can have a strong influence on children's activity levels. However, several family-based health promotion programs reported low parent participation rates, suggesting that it may be difficult to get parents involved in child health promotion programs (Sallis, 1998). The SPARK study also revealed low parent participation in the program (Marcoux et al., 1999). In the current study, parental involvement was limited to one information letter, in which the importance of family support was emphasized, and parents were asked to support their child to be active, along with the sample who were also surveyed. Nevertheless, the self-report data revealed that family support to be physically active was reported by half of the children.

Limitations of the present investigation include the possible influence of social desirability in participants' responses, especially with parent and teacher surveys in which dichotomous questions provoked forced responses. It is also not known whether teachers' enthusiasm will be similar when they are implementing

the lessons. Hence, further studies are necessary to evaluate the implementation of the self-management program by the teachers. Furthermore, it was not possible to objectively measure the isolated effect of the self-management program on children's activity levels due to other program aspects. The isolated effects of the self-management program on children's at-school and out-of-school physical activity levels should be further investigated in a larger randomized controlled study along with more intensive parental involvement.

In conclusion, the results of the current study demonstrated that the self-management program was well perceived. Because the classroom teachers were expected to give the lessons in the future, their receptiveness to the program was an important study finding. The self-management lessons to promote lifelong physical activity in elementary schools are new to elementary schools in Europe. Because the promotion of regular physical activity is also necessary for all young people and the development of an active lifestyle implies behavioral change, further evaluation of the classroom-based self-management lessons are needed. Evaluating the receptiveness of the self-management program was only a first step.

Acknowledgments

This study is part of a broader research project entitled Sport, Physical Activity, and Health (*Sport, Beweging, en Gezondheid*), carried out by the Policy Research Centre, a consortium of researchers from KULeuven, Ghent University, and VUBrussel, and funded by the Flemish government. The authors gratefully thank James Sallis, Thomas McKenzie, and Paul Rosengard for their support, helpful suggestions, and practical advice in this study.

References

- Almond, L., & Harris, J. (1998). Interventions to promote health-related physical education. In S.J.H. Biddle, J.F. Sallis, & N. Cavill (Eds.), *Young and Active?* (pp. 133–149). London: Health Education Authority.
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 31*, 143–164.
- Barlow, J., Wright, C., Sheasby, J., Turner, A., & Hainsworth, J. (2002). Self-management approaches for people with chronic conditions: A review. *Patient Education and Counseling, 48*, 177–187.
- Biddle, S.J.H., Gorely, T., & Stensel, D.J. (2004). Health-enhancing physical activity and sedentary behaviour in children and adolescents. *Journal of Sports Sciences, 22*, 679–701.
- Cardon, G., De Bourdeaudhuij, I., & De Clercq, D. (2001). Back care education in elementary school: a pilot study investigating the complementary role of the class teacher. *Patient Education and Counseling, 45*, 219–226.
- Cardon, G.M., & De Bourdeaudhuij, I.M.M. (2002). Physical education and physical activity in elementary schools in Flanders. *European Journal of Physical Education, 7*, 5–18.
- Cardon, G.M., De Bourdeaudhuij, I.M.M., & De Clercq, D. (2002). Back education in Belgian elementary schools: knowledge and perceptions of pupils, parents and teachers. *The Journal of School Health, 72*, 100–106.

- Cavill, N., Biddle, S., & Sallis, J.F. (2001). Health enhancing physical activity for young people: Statement of the United Kingdom Expert Consensus Conference. *Pediatric Exercise Science, 13*, 12–25.
- De Vries, H., Backbier, E., Kok, G., & Dijkstra, M. (1995). The Impact of Social Influences in the Context of Attitude, Self-Efficacy, Intention, and Previous Behavior as Predictors of Smoking Onset. *Journal of Applied Social Psychology, 25*, 237–257.
- De Vries, H., Dijkstra, M., & Kuhlman, P. (1988). Self-efficacy: third factor besides attitude and subjective norm as a predictor of behavioral intentions. *Health Education Research, 3*, 273–282.
- Dishman, R.K., Motl, R.W., Sallis, J.F., Dunn, A.L., Birnbaum, A.S., & Welk, G.J. (2005). Self-management strategies mediate self-efficacy and physical activity. *American Journal of Preventive Medicine, 29*, 10–18.
- Douthitt, V.L., & Harvey, M.L. (1995). Exercise counseling - how physical educators can help. *Journal of Physical Education, Recreation and Dance, 66*, 31–35.
- Harris, J. (2005). Health-related exercise and physical education. In K. Green & K. Hardman (Eds.), *Physical education: essential issues* (pp. 78–97). London: SAGE Publications Company.
- Harsha, D.W. (1995). The benefits of physical activity in childhood. *The American Journal of the Medical Sciences, 310*(Suppl. 1), 109–113.
- Kanfer, F.H., & Gaelick-Buys, L. (1991). Self-Management Methods. In F.H. Kanfer & A.P. Goldstein (Eds.), *Helping people change: A textbook of methods* (pp. 305–360). New York: Pergamon Press.
- Karoly, P., & Kanfer, F.H. (1982). *Self-management and behaviour change: From theory to practice*. New York: Pergamon Press.
- Lefevre, J., Philippaerts, R., Delvaux, K., Thomis, M., Vanreusel, B., Eynde, B.V., et al. (2000). Daily physical activity and physical fitness from adolescence to adulthood: a longitudinal study. *American Journal of Human Biology, 12*, 487–497.
- Malina, R.M. (1996). Tracking of physical activity and physical fitness across the lifespan. *Research Quarterly for Exercise and Sport, 67*(Suppl. 3), 48–57.
- Marcoux, M., Sallis, J.F., McKenzie, T.L., Marshall, S., Armstrong, C.A., & Goggin, K.J. (1999). Process evaluation of a physical activity self-management program for children: SPARK. *Psychology & Health, 14*, 659–677.
- Nader, P.R., Stone, E.J., Lytle, L.A., Perry, C.L., Osganian, S.K., Kelder, S., et al. (1999). Three-year maintenance of improved diet and physical activity: the CATCH cohort. Child and Adolescent Trial for Cardiovascular Health. *Archives of Pediatrics & Adolescent Medicine, 53*, 695–704.
- NASPE. (2004). *Physical Activity for Children: A Statement of Guidelines for Children Ages 5-12* (2nd ed.). Reston, VA: NASPE Publications.
- Pate, R.R., Freedson, P.S., Sallis, J.F., Taylor, W.C., Sirard, J., Trost, S.G., et al. (2002). Compliance with physical activity guidelines: Prevalence in a population of children and youth. *Annals of Epidemiology, 12*, 303–308.
- Resnicow, K., Robinson, T.N., & Frank, E. (1996). Advances and future directions for school-based health promotion research: commentary on the CATCH intervention trial. *Preventive Medicine, 25*, 378–383.
- Riddoch, C.J., Andersen, L.B., Wedderkopp, N., Harro, M., Klasson-Heggebo, L.K., Sardinha, L.B., et al. (2004). Physical activity levels and patterns of 9- and 15-yr-old European children. *Medicine and Science in Sports and Exercise, 36*, 86–92.
- Roberts, C., Tynjälä, J., & Komkov, A. (2004) Physical activity. In C. Currie, C. Roberts, A., Morgan, R. Smith, W. Settertobulte, O. Samdal, et al. (Eds.), *Young people's health in context. Health Behaviour in School-aged Children (HBSC) study: international report from 2001/2002 survey (PP90-97)*. Copenhagen: World Health Organization.

- Sallis, J. (1998). Family and community interventions to promote physical activity in young people. In S.J.H. Biddle, J.F. Sallis, & N. Cavill (Eds.), *Young and Active?* (pp. 150–161). London: Health Education Authority.
- Sallis, J.F., McKenzie, T.L., Alcaraz, J.E., Kolody, B., Faucette, N., & Hovell, M.F. (1997). The effect of a 2-year physical education program (SPARK) on physical activity and fitness in elementary school students. *American Journal of Public Health, 87*, 1328–1334.
- Simons-Morton, B.G., Parcel, G.S., Baranowski, T., Forthofer, R., & O'Hara, N.M. (1991). Promoting physical activity and a healthful diet among children: Results of a school-based intervention study. *American Journal of Public Health, 81*, 986–991.
- Trost, S.G., Pate, R.R., Sallis, J.F., Freedson, P.S., Taylor, W.C., Dowda, M., et al. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine and Science in Sports and Exercise, 34*, 350–355.
- Vandongen, R., Jenner, D.A., Thompson, C., Taggart, A.C., Spickett, E.E., Burke, V., et al. (1995). A controlled evaluation of a fitness and nutrition intervention program on cardiovascular health in 10- to 12-year-old children. *Preventive Medicine, 24*, 9–22.
- Verstraete, S.J., Cardon, G.M., De Clercq, D.L.R., & De Bourdeaudhuij, I.M.M. (2006). Increasing children's physical activity levels during recess periods in elementary schools: the effects of providing game equipment. *European Journal of Public Health, 16*, 415–419.
- Verstraete, S.J., Cardon, G.M., De Clercq, D.L.R., & De Bourdeaudhuij, I.M.M. (2007a). Effectiveness of a two-year health-related physical education intervention in elementary schools. *Journal of Teaching in Physical Education, 26*, 20–34.
- Verstraete, S.J., Cardon, G.M., De Clercq, D.L.R., & De Bourdeaudhuij, I.M.M. (2007b). A comprehensive physical activity promotion programme at elementary school: the effects on physical activity, physical fitness and psychosocial correlates of physical activity. *Public Health Nutrition, 10*, 477–484.
- Wright, C.C., Barlow, J.H., Turner, A.P., & Bancroft, G.V. (2003). Self-management training for people with chronic disease: an exploratory study. *British Journal of Health Psychology, 8*, 465–476.

Copyright of Journal of Teaching in Physical Education is the property of Human Kinetics Publishers, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.