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Effectiveness of interventions promoting physical activity in young people in Europe

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Abstract

Despite a significant evidence base about the benefits of physical activity [PA], most children remain resistant to adopting and maintaining active lifestyles. There have been several large studies of the physical activity characteristics of young people in Europe over the last decade. European boys of all ages participate in more physical activity than European girls and the gender difference is more marked when vigorous activity is considered. There is a marked reduction in activity over the adolescent years (Armstrong & Welsman, 2006). Several types of intervention have been used to increase the PA levels of young people in Europe. In a recent systematic review of interventions, Van-Sluijs et al. (2007) identified 57 studies worldwide, of which 17 were conducted in Europe (9 in UK, 3 in Greece, 1 in Ireland, 1 in France, 1 in Finland, 1 in Netherlands, and 1 in Spain). Eight of the 17 EU studies exhibited high methodological quality. The studies (13 out of 17) focusing on children (<12 years) employed educational (6 studies), environmental (4 studies), and multi-component (3 studies) interventions. Three high quality educational studies, 1 high quality environmental study, and 1 high quality multi-component study reported a significant positive effect. All except one (family-based intervention) study of children involved school-based interventions. Five studies were restricted to school setting only and six evaluated school-based interventions which also included family or community components. Four of the school setting only interventions, and four of the school plus family or community interventions reported a significant positive effect. The studies (4 out of 17) focusing on adolescents (>12 years) employed educational (2 studies) and multi-component (2 studies) interventions. Only 1 multi-component study was considered to be of high quality and this study reported a significant positive effect of a school plus family or community component. The limited number of European studies highlights the need for more high quality studies. From the 13 studies conducted with children, 8 reported a significant positive effect and they were all school-based interventions. Only 4 European studies focused on adolescents, stressing the urgent need for interventions targeting this population. Overall, the evidence from the 57 studies worldwide was inconsistent for children with the strongest effects coming from studies with adolescents. Specifically, some evidence of effect was shown for environmental interventions targeting children, whereas multi-component interventions may make important differences in physical activity levels in adolescents. These findings support recent calls for the incorporation of both individual-level and environmental-level factors in an integrated approach to physical activity research and practice. Considering multiple levels (e.g., intrapersonal, interpersonal, home, school, community, policy) of influence on young people's behaviour will contribute to the understanding of the principal determinants of PA and the causes of the inactivity among young people. This approach requires interventions that are context-specific, expand outside the school setting and are developed locally. Although there are currently no interventions which could be described as a model for "best practice", new interventions need to mesh better with how the problem of inactivity is dealt in real life settings.

Effectiveness of interventions promoting physical activity in young people in Europe

Lifelong physical activity reduces the risk for a variety of chronic diseases developed in adulthood (Department of Health, 2004). As most of these diseases result from processes that begin early in life, promoting active lifestyles in children presents an attractive strategy for promoting adult health (Boreham & Riddoch, 2001), pushing physical activity promotion high on the health policy agenda for children and young people.

Despite a significant evidence base about the benefits of physical activity, most children remain resistant to adopting and maintaining active lifestyles. There have been several large studies of the physical activity characteristics of children and youth in Europe over the last decade. European boys of all ages participate in more physical activity than European girls and the gender difference is more marked when vigorous activity is considered. There is a marked reduction in activity over the adolescent years (Armstrong & Welsman, 2006).

Accelerometry data from the European Youth Heart Study on 2185 nine and 15 year-old children and youth demonstrated a large drop in moderate to vigorous physical activity (MVPA) over this time (Riddoch et al., 2004). More recently, the Avon Longitudinal Study of Parents and Children stressed the low number of children who meet the recommended levels of physical activity. Among 5,000 11-year old children only 2% met the criterion for continuous MVPA of at least 20 minutes duration, instead undertaking most activity at a lower intensity. This large cohort study confirmed that boys are more active than girls as 40% of boys undertook MVPA for 5 minutes whereas the equivalent figure for girls was 22% (Riddoch et al, 2007).

At the lower end of the physical activity continuum, sedentary behaviour corresponds to a complementary dimension of physical activity behaviour (Katzmarzyk et al., 2007). The amount of sedentary behaviour might be more important to measure

than physical activity levels especially with pre-school children. Cross-sectional and longitudinal data show that more than 2-3 hours daily of inactivity has been associated with increased overweight and obesity in pre-school children, whereas, high amounts of TV viewing in infants has been shown to track into childhood. Shifts at the patterns and levels of sedentary behaviours over time and the causes for these shifts need to be examined. Studies should broaden their focus from solely examining markers of television viewing to the investigation of the so-called "small screen recreational activities" (Katzmarzyk et al 2007:6) which include use of computers for surfing the internet and playing video games. This dimension of sedentary behaviour will require the development and validation of new measurement tools.

Several types of interventions have been used in increasing physical activity levels of young people in Europe. In a recent systematic review of interventions to promote physical activity in young people, Van-Sluijs et al. (2007) identified 57 studies worldwide, from which 17 were contacted in Europe (9 in UK, 3 in Greece, 1 in Ireland, 1 in France, 1 in Finland, 1 in Netherlands, and 1 in Spain). Eight of the 17 European exhibited high methodological quality.

The studies (13 out of 17) focusing on children (<12 years) employed educational (6 studies), environmental (4 studies), and multi-component (3 studies) interventions. Three high quality educational studies, 1 high quality environmental study, and 1 high quality multi-component study reported a significant positive effect. All except one (family-based intervention) study of children involvedschool-based interventions. Five studies were restricted to the school setting only and six evaluated school-based interventions which also included family or community components. Four of the school setting only interventions, and four of the school plus family or community reported a significant positive effect. The studies (4 out of 17) focusing on adolescents (>12 years) employed educational (2 studies) and multi-component (2 studies) interventions. Only 1 multi-component study was considered to be of high quality and this study reported a significant positive effect of a school plus family or community component.

The limited number of European studies highlights the need for more high quality studies. From the 13 studies conducted with children, 8 reported a significant positive effect and they were all school-based interventions. Only 4 European studies focused on adolescents, stressing the urgent need for interventions targeting this population. Overall, the evidence from the 57 studies worldwide was inconsistent for children with the strongest effects coming from studies with adolescents. Specifically, some evidence of effect was shown for environmental interventions targeting children, whereas multi-component interventions may make important differences in physical activity levels in adolescents.

These findings support recent calls for the incorporation of both individual-level and environmental-level factors in an integrated approach to physical activity research and practice. This approach is the base for a shift to the transdisciplinary paradigm which combines concepts and methods from disciplines ranging from exercise and behavioural sciences, to urban planning and transportation (Sallis et al, 2006). Considering multiple levels (e.g., intrapersonal, interpersonal, home, school, community, policy) of influence on young people's behaviour will contribute to the understanding of the principal determinants of PA and the causes of the inactivity among young people. This approach requires interventions that are context-specific, expand outside the school setting and are developed locally. Research conducted in naturalistic settings, and from an ecological approach could provide valuable insights into our currently restricted knowledge of why physical activity is decreasing, and how we might tackle it. Although there are currently no interventions which could be described as a model for "best practice", new interventions need to mesh better with how the problem of inactivity is dealt in real life settings. That in turn, requires close collaboration between researchers and decision makers and development of new evaluation tools for complex multi-method physical activity promotion programmes (Nutbeam and Bauman, 2006).

Sixty-seven per cent of the studies reviewed by Van-Sluijs et al showed a positive intervention effect; this varied from a 42% increase in participation in regular physical activity to an increase of 83 minutes per week in MVPA. In order to conduct a meaningful overview of the results of different trials the different levels of PA need to be clearly differentiated in results sections. Studies often contain information about physical activity of more than one intensity or type, and we need to reinforce the importance of reporting the relationship between the determinants, mediators and intervention manipulations separately for each.

The variety of measures of PA expressed in terms of duration (e.g. in minutes), frequency (e.g. times per week), intensity (e.g. vigorous) or a combination of these, i.e. in terms of volume (e.g. METs or kcal) carries several implications. The lack of precision in exposure variable (PA) leads to underestimation of strength of relationships with outcome (health) variables. Self reported PA carries substantial error and hence until very recently, our ability to detect relationships was limited. Assessing physical activity in children poses specific challenges because their movement is characterised by short bursts of activity and velocity and movement types can vary considerably. Children also, find it more difficult than adults to accurately recall activity (Oliver, Schofield, &Kolt, 2007). The development of objective methods of measuring PA have greatly improved our measurement precision and uncovered strong relationships with health parameters. This picture will further be improved by new developments in the use of global positioning systems (GPS) in monitoring young people's activities within their physical environments.

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