Interventions to Promote Physical Activity in Young Children
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Introduction

Adequate participation in physical activity during early childhood is considered essential for normal growth and development. Physical activity is also an important contributing factor in the prevention of overweight and obesity in young children. In recognition of the importance of regular physical activity, the National Association for Sport and Physical Education (NASPE) in the United States has issued guidelines recommending that all children from birth to age five engage in daily physical activity that promotes health-related fitness and movement skills. Similar recommendations have been issued by clinicians, researchers and early childhood education stakeholders in Canada, Australia and the United Kingdom. Yet, despite the importance of regular physical activity, objective monitoring studies conducted in North America, Australia and the United Kingdom suggest that young children accumulate relatively small amounts of moderate-to-vigorous physical activity daily.

Subject

The widespread problem of physical inactivity, taken alongside the continued rise in the prevalence of obesity in children under the age of 5, underscores the need for effective but readily translatable policies and programs to promote physical activity in young children. This brief review will summarize what is currently known about interventions to promote physical activity in early childhood settings.

Problem

Relatively few interventions to promote physical activity in children under 5 have been rigorously evaluated. Consequently, we have very limited scientific evidence to tell policy makers, service planners and providers what works and what doesn’t work when it comes to getting young children more physically active.
Research Context

Because a large percentage of children under the age of 5 are in some type of regular child care arrangement, intervention studies have been primarily implemented and tested in center-based early childhood education settings. Notably, however, physical activity interventions targeting other types of child care settings such as family child care homes are beginning to appear in the research literature.

Key Research Questions

Published studies in this area have primarily addressed the question of whether curricula emphasizing structured physical activity, movement skill training or reductions in television watching are effective at increasing physical activity. Other studies have investigated the impact of specific environmental or policy changes on physical activity levels during child care.

Recent Research Results

To date, eight studies have employed experimental study designs to evaluate interventions to increase physical activity in young children. Five studies tested the effectiveness of specialized physical activity curricula or movement training programs, while the remaining three studies evaluated the impact of environmental or policy changes on physical activity level.

In the five studies testing curriculum-based approaches, activity sessions ranged from highly prescriptive exercise training regimens (jumping, hopping, skipping, circuit training) to developmentally-appropriate, physically active imagination games and skits. Two investigations included strategies to improve fundamental movement skills. The planned activity sessions or lessons were implemented on-site by research staff and/or trained teachers. Children participated in the activity sessions between three and six days per week. The duration of the entire program ranged from 14 weeks to 12 months.

In general, the curriculum-based approaches were not successful in promoting physical activity in young children. Of the five curriculum-based studies identified, only two reported significant improvements in physical activity. However, both of these investigations could be regarded as controlled exercise training studies that implemented highly structured and repetitive physical activity regimens. The three studies reporting null findings trained child care staff to implement developmentally-appropriate games and activities that provided opportunities for moderate-to-vigorous physical activity and movement skill development. The failure of these studies to increase physical activity may be related to the program’s focus on obesity prevention rather than physical activity per se. It is also possible that the interventions were insufficient in length and intensity to significantly change behaviour; however, two of the three studies reported significant reductions in body fatness. Considering the positive impact on fatness, it is possible that the measurement protocols used to quantify physical activity behaviour may not have been sufficiently sensitive to detect changes in physical activity.

Although few in number, studies evaluating environmental or policy interventions to promote physical activity have reported mostly positive findings. The addition of portable playground equipment and training teachers to incorporate physical activity into their usual classroom lessons resulted in significant increases in objectively
measured daily physical activity.\textsuperscript{13,14} Notably, providing an additional 60 minutes of outdoor recess or free play each day did not result in significant increases in moderate-to-vigorous physical activity.\textsuperscript{15}

**Research Gaps**

To advance our understanding in this area, some key research questions would include: 1) What are the key behavioural settings for promoting physical activity in young children? 2) Are programs to promote movement or physical activity in infants and toddlers warranted, and if so, what settings and strategies would be effective? 3) Are modifications to the child care environment such as incorporating natural playground design and improving service provider’s physical activity leadership skills effective in increasing physical activity in young children? 4) Are structured physical activity programs led by physical education specialists or community-based physical activity providers feasible, sustainable, and effective in promoting physical activity in other behavior settings? 5) How can child care providers engage and motivate parents and other caregivers to promote and support physical activity at home?

**Conclusions**

Relatively few interventions to promote physical activity in children under 5 have been rigorously evaluated. The available evidence, although limited, suggests that simple modifications to the outdoor play environment such as the provision of “off the shelf” portable play equipment can increase physical activity behaviour. Additionally, training teachers to incorporate movement into the standard classroom curriculum appears to be effective in increasing physical activity levels during the preschool day. Nevertheless, because these results were obtained in small feasibility studies, such findings require replication in larger cluster randomized trials.

To date, providing curricula that offer opportunities for developmentally-appropriate moderate-to-vigorous active play and fundamental movement skill development has not been effective in promoting physical activity. It may be that such approaches are simply ineffective and that alternative strategies require exploration. Nonetheless, it should be noted that these studies: 1) focused on obesity prevention rather than physical activity, 2) provided activity sessions that were relatively brief in duration (~30 min) and low in frequency (three days per week); 3) were implemented over a relatively short time period (12 - 24 weeks); and 4) employed physical activity measurement protocols with limited sensitivity to detect changes in physical activity behaviour.

Adult-led physical activity programs delivering highly structured exercise training sessions on a daily basis resulted in higher levels of physical activity. However, it is important to note that these studies were primarily exercise training studies in which physical activity was the factor being changed, not the outcome of the change. Thus, it is questionable whether these findings can be generalized to public health approaches to promoting physical activity in young children.

**Implications for Parents, Services and Policy**

For policy makers and service providers, the extant research literature provides relatively little guidance as to what approaches are effective in promoting physical activity in young children. The research suggests that training child care staff to increase opportunities for physical activity in the classroom and during recess may be an effective strategy. From a public health perspective, the focus on child care provider training is particularly
attractive, since the trainings could be mandated as a licensure requirement and delivered through existing child care worker education and training networks.

Based on the evidence, policy makers and service providers should be wary of adopting stand-alone curricula offering structured physical activity and movement skill training, as there is currently little evidence to support their effectiveness. However, it should be noted that structured programs are not likely to do harm to young children; and in practice, such programs may off substantial benefit to children when they are implemented in a responsible, developmentally-appropriate manner.

While the evidence related to physical activity interventions in child care settings is not definitive, it is well-established that parents play a significant role in shaping and supporting their children’s physical activity behaviour. In the absence of evidence-based programs to promote physical activity in child care settings, parents must be willing to take responsibility for encouraging and supporting their children’s physical activity behaviour. The development of programs to educate and support parents in this endeavour should therefore be a priority.

References
