Physical activity participation and the youth: A review of correlates based on the social-ecological framework

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The major objective of this review was to identify and summarize the current literature that used the social-ecological model to address factors associated with young people’s physical activity participation. A review of the literature was undertaken using a reference between Jan 2004 and Nov 2012, based primarily on the Medline and PubMed; SPORTDiscus; PsychInfo; Cochrane; CINAHL; ScienceDirect; Web of Knowledge; and Social SciSearch databases. Only those original papers that explicitly used the social-ecological framework to analyze factors associated with physical activity participation in children and adolescents were included. A total of five original articles were deemed relevant to the topic. Current evidence suggests that individual factors (self-efficacy and fun), social environmental factors (peer support, parents’ and families’ support, physical education teachers’ support and economic status of the family), physical environmental factors (equipment availability, school facilities and location), and policy factors (higher level policies, school implementation strategies, teacher supervision, safety rules, sports equipment accessibility and play areas accessibility) would all affect young people’s physical activity participation. Synthesis: To date, only a few studies have used the social-ecological framework to analyze factors affecting physical activity participation behavior in young people. Further quantitative studies are essential to confirm how these factors interact and affect physical activity participation in the younger generation.

Key words: adolescents, children, ecological model, exercise behavior, health.

INTRODUCTION

Physical activity is of paramount importance in the developing individuals because it is associated with a number of physical and psychosocial health benefits (Andersen et al., 1998; Butcher, 1983). In spite of these benefits, many young people are not meeting the daily physical activity guidelines (McKenzie, 2001). Improving physical activity levels in the youth is indeed a public health challenge around the world (Aaron et al., 1993).

Numerous studies have tried to understand the determinants of physical activity participation in young people (Hinkley et al., 2008; Park and Kim, 2008; Sallis et al., 2000) so as to design proper strategies or interventions to improve their exercise level. However, not many studies have analyzed the correlates of physical activity systematically by using theory or model (Hinkley et al., 2008; Park and Kim, 2008; Sallis et al., 2000). Identifying model-based factors that influence physical activity behavior could provide a clearer understanding of the decisions young people made regarding being physically active. In addition, it could facilitate the development of more effective intervention strategies aimed at the promotion of physical activity among children and adolescents (Zhang et al., 2012).

One of the contemporary models used by researchers to explain physical activity behavior is the social-ecological model (Sallis et al., 2008). The term, social ecology, refers to individuals’ interactions with their physical and socio-cultural environment (Sallis and Owen, 1999). This theoretical framework is attractive for identifying factors affecting physical activity and health promotion programs because multiple levels (that is, individual level, social environmental level, physical environmental level, and policy level) of influences can be addressed simultaneously rather than a conventional unitary focus on individual-level factors (Emmons, 2000; Sallis et al., 2008). It could then give a better direction to the design of effective intervention strategies for improving physical activity participation in different
populations including children and adolescents (Sallis et al., 2008; Zhang et al., 2012).

Nowadays, there is increasing number of researchers advocate the use of a social ecological perspective of human behavior as an organizational framework to identify specific correlates that might influence students' physical activity (Welk, 1999; Zhang et al., 2012). This paper aimed to review all the inter-related factors that might affect physical activity participation in young people based on this social-ecological framework.

MATERIALS AND METHODS

The following databases were searched for English-language and original research articles published between Jan 2004 (because the social-ecological model was not well developed until 2003) (Sallis et al., 2008) and Nov 2012; Medline and PubMed; SPORTDiscus; PsychInfo; Cochrane; CINAHL; ScienceDirect; Web of Knowledge; and Social SciSearch. Search terms included social, ecological, physical, activity, exercise, play, sports, participation, environment, school, family, community, and policy. In addition, adolescent, children, youth, and student were added to the above terms in order to limit studies pertain to the younger populations. The bibliographies of the identified studies were also reviewed to obtain additional references. Only those papers that explicitly used social-ecological framework to analyze factors associated with physical activity participation were included. Those used social learning theory, social cognitive theory, ecological model of health behavior or other models; did not use any framework; without full text (e.g., conference proceedings); unpublished studies; or review articles were all excluded.

RESULTS

After manual screening, a total of five papers were deemed relevant to the topic. Three of them were qualitative researches and two of them were quantitative researches. Regarding the quantitative researches, all were cross-sectional in design. The participants, measurements and results of these studies were summarized in Table 1.

DISCUSSION

Although there are a number of review articles summarizing factors affecting physical activity participation in children and adolescents (Davison and Lawson, 2006; Park and Kim, 2008), they did not highlight the importance and interactions among individual factors, social environmental factors, physical environmental factors, and policy factors (that is, use the social ecological model). To our knowledge, this is the first review article aimed to summarize recent studies that used the social-ecological framework to evaluate factors affecting physical activity participation behavior in young people.

Individual factors

Among the five studies reviewed, only two studies described how individual factors affected physical activity in school-aged children. Using an eight-item scale to measure students’ confidence in different physical activities, Zhang et al. (2012) found that self-efficacy was a strong predictor of middle-school students’ physical activity participation behavior. Students with higher self-efficacy were more likely to engage in physical activities regularly than those with lower self-efficacy. Moreover, self-efficacy was related to social and physical environmental factors such as encouragement from physical education teachers and availability of resources. Apart from self-efficacy, Hyndman et al. (2012) reported that having fun was a major intrapersonal factor affecting non-curricular physical activity participation in primary and secondary school students. Fun was described by the students as participating in activities with friends or when an activity gave them a thrill. Since this was an exploratory qualitative study that used a focus group discussion method, further quantitative studies might be necessary to describe and quantify the subjective feeling ‘fun’ with objective measures so that proper strategies can be suggested to improve physical activity participation in school-aged children.

Social environmental factors

Social support from friends, parents, and physical education teachers were significant predictors of self-reported engagement in physical activity in middle-school students, after accounting for the variance beyond the contribution of self-efficacy (Zhang et al., 2012). Among these three social environmental factors, positive peer support (e.g., encouragement and praise from friends and engaging in physical activities with friends) was found to be the most important factor affecting physical activity participation in young people (Hyndman, 2012; Zhang et al., 2012), particularly in adolescent boys (Ries et al., 2008). The second most important factor, as perceived by students and adolescents, was parents’ support (Ries et al., 2008; Zhang et al., 2012) perhaps because children and adolescents still relied on their parents’ financial support and encouragement in their daily activities. Parents’ beliefs and behaviors might still affect their child’s lifestyle (e.g., being physically active or not) (Zhang et al., 2012). This finding was in line with Xu et al. (2010) who
### Table 1. Summary of research studies.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample</th>
<th>Study design</th>
<th>Measurements</th>
<th>Theoretical framework</th>
<th>Results (associated with physical activity participation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhang et al. (2012)</td>
<td>285 middle school students (142 boys and 143 girls; Mean age: 13.8 years)</td>
<td>Quantitative; Cross-sectional</td>
<td>(1) An 8-item scale was used to assess the students’ confidence to be physically active under various conflicting situations; (2) the participants' perceived social support from friends and parents, and physical education teachers were assessed by a 5-point Likert scale and a 6-item scale, respectively; (3) physical environment scale; and (4) physical activity questionnaire for older children.</td>
<td>Social-ecological</td>
<td>Significant predictors of physical activity behavior in students, in descending order of importance, were barrier self-efficacy, friends' support, parents' support, physical education teachers' support, and equipment accessibility. Neighborhood safety was not a significant predictor.</td>
</tr>
<tr>
<td>Xu et al. (2010)</td>
<td>292 physical education teachers</td>
<td>Quantitative; Cross-sectional</td>
<td>An online questionnaire, targeting the physical education teachers, was used to determine the physical activity opportunities and its association with different social and physical environmental factors.</td>
<td>Social-ecological</td>
<td>Significant associations between physical activity opportunities and facilities availability, school location, school policies, and family support.</td>
</tr>
<tr>
<td>Ries et al. (2008)</td>
<td>50 adolescents</td>
<td>Qualitative</td>
<td>Concept mapping with 50 adolescents was used to obtain cluster maps of conceptual domains (with focus on social and physical environmental factors) affecting physical activity participation.</td>
<td>Social-ecological</td>
<td>Seven domains might affect physical activity participation namely, physical activity settings, social support, negative social influences, parental control, negative environmental influences, transportation and technology, and financial issues. Their relative importance to physical activity was affected by gender.</td>
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<tr>
<td>Langille and Rodgers (2010)</td>
<td>4 government representatives, 3 public school board members, 3 principals, and 4 teachers (total: 8 women and 6 men)</td>
<td>Qualitative</td>
<td>Interviews</td>
<td>Social-ecological</td>
<td>Higher level policies trickled down into the organizational level. There was pivotal responsibility for schools to determine how to implement physical activity strategies. School might have difficulty in implementing physical activity because of the continued higher priority of academic achievement.</td>
</tr>
<tr>
<td>Hyndman et al. (2012)</td>
<td>47 primary and 29 secondary school students</td>
<td>Qualitative</td>
<td>Focus group discussion and/or map drawing.</td>
<td>Social-ecological</td>
<td>There were a lack of facilities and play spaces conducive to active play during transition from primary to secondary school. Moreover, factors influencing physical activity participation of primary and secondary school students were fun, positive peer influence, teacher role models, availability of sporting facilities and equipment, supervision, safety rules, and accessibility of sports equipment and play areas etc.</td>
</tr>
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</table>

reported that family support was independently associated with students’ extracurricular physical activity opportunity, as perceived by the physical education teachers.
A third significant social environment factor affecting students’ engagement in physical activity was ‘perceived physical education teachers’ support’. This might be because physical education teachers could provide a supportive environment during physical education classes that might encourage students to be physically active (Zhang et al., 2012). Moreover, teachers could act as a role model to facilitate students’ participation in physical activities (Hyndman, 2012).

Economic status of the family might also affect physical activity participation in adolescents because lower income populations might not be able to afford the costs of physical education activities (Ries et al., 2008). However, further quantitative studies are needed to confirm the influence of this factor on physical activity participation in younger people. Indeed, earlier qualitative study suggested that crime rate might be a factor that hindered physical activity participation in adolescents (Ries et al., 2008). Recent quantitative study proved that neighborhood safety was actually not a factor affecting school students’ physical activity (Zhang et al., 2012). Therefore, further quantitative studies confirming the correlates of physical activity in young people are warranted.

Physical environmental factors

Equipment availability was found to be a significant physical environmental factor on students’ physical activity participation, though the contribution of this factor was relatively small. It accounted for only 1.1% of the variance in physical activity participation (Zhang et al., 2012). Xu et al. (2010) also found that school facilities and school location were multivariately associated with students’ physical activity opportunity. The authors suggested that when compared with inner-city middle schools that had limited space, suburban schools tended to have better facilities (Wang et al., 2003) and this might offer more physical activity opportunities for students (Xu et al., 2010). However, it should be noted that making equipment and facilities easily accessible might not be sufficient to increase students’ physical activity level. Health promoters need to provide a supportive social environment (e.g., offer low-cost physical activity programs for low-income families) in addition to enough facilities and equipment within the school and community settings in order to enhance young people’s physical activity self-efficacy and engagement (Ries et al., 2008; Zhang et al., 2012). This is a good example to illustrate that individual, social environmental and physical environmental factors interact to affect physical activity participation behavior in young people (a key concept of the social-ecological model) (Stokols, 1996).

Regarding the facilities and equipment, which kinds of facilities or equipment are most ideal for improving physical activity participation in young people? A recent qualitative study has provided some insights. In general, students perceived that sporting facilities, adventure type equipment and playground equipment could facilitate their participation in physical activity. Specifically, primary school students preferred spacious play areas with safety measures while secondary school students preferred natural environment more than built environment (Hyndman et al., 2012).

Interestingly, Xu and colleagues (2010) reported that transportation did not have a strong impact on students’ extracurricular physical activity opportunities. Their finding was in some contrast to Timperio et al. (2006)’s finding who reported that busy road barrier en route to school was an obstacle to active commuting to school and so physical activity opportunities. Further studies are, therefore, necessary to confirm this potential physical environmental barrier to activity participation in school-aged children.

Policy factors

Policy is the highest level process that has a strong influence on lower levels within the social-ecological model (Langille and Rodgers, 2010; Stokols, 1996). However, there are only two qualitative studies exploring the policy factors that might affect physical activity participation in young people by using the social-ecological framework (Hyndman et al., 2012; Langille and Rodgers, 2010). Through face-to-face interviews with stakeholders of different levels, Langille and Rodgers (2010) found that although higher level (e.g., government) policies “trickled down” into the organization level (e.g., school level), there was pivotal responsibility for schools to determine how to implement physical activity strategies. Indeed, schools had difficulty when implementing physical activity programs because of the continued higher priority of academic achievement (Langille and Rodgers, 2010). Hyndman et al. (2012) supplemented that teacher supervision, safety rules, sports equipment and play areas accessibility were the key policy factors at the school and organization level that might affect physical activity participation in children and adolescents (Hyndman et al., 2012). Further studies might fruitfully explore how these policy factors interact with individual, social environmental and physical environmental factors so that more effective strategies could be developed to improve physical activity participation in children and adolescents.

LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

Since there are only a few studies reporting factors affecting physical activity in young people by using the social-ecological model, those factors reviewed in this
article might only be the tip of the iceberg. Perhaps many other factors affecting young people's activity participation behavior are not yet explored. Moreover, based on the social-ecological model, how factors from different levels interact in regard to physical activity participation (Emmons, 2000; Stokols, 1996) is not clear. The current scientific evidence is of relatively low levels (qualitative and cross-sectional studies) and so further quantitative studies (e.g., longitudinal studies) are awaited to confirm how factors from different levels of the social-ecological model interact and affect physical activity participation in young people.

To conclude, adopting the social-ecological model to analyze factors affecting physical activity behavior is desirable because multiple levels of influences can be acknowledged at the same time (Sallis et al., 2008). However, to date, not many studies have used this framework explicitly to analyze factors affecting physical activity participation behavior in young people. Nevertheless, current evidence suggests that individual factors (self-efficacy and fun), social environmental factors (peer support, parents' and families' support, physical education teachers' support and economic status of the family), physical environmental factors (equipment availability, school facilities and location), and policy factors (higher level policies, school implementation strategies, teacher supervision, safety rules, sports equipment accessibility and play areas accessibility) would all affect students’ physical activity participation. Further quantitative studies are needed to confirm how these factors interact and affect physical activity participation behavior in the younger generation.

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