Seasonal Variation in Physical Activity Among Children and Adolescents: A Review

Valerie Carson and John C. Spence
University of Alberta

The purpose of this review was to examine seasonal variation in physical activity among children and adolescents. Searches were conducted of electronic databases for studies on seasonal differences in physical activity levels. A total of 35 studies, including children and adolescents between the ages of 2–19 years, were reviewed. Overall, 83% (29/35) of the studies found seasonal variation in physical activity among children and/or adolescents. The results were consistent regardless of the region, physical activity measure, or the study design but the findings were inconsistent across age categories.

Physical activity plays a key role in the physical growth, biological maturation, and behavioral development of children (29,52). Children who are more physically active are less at risk for chronic diseases such as obesity and type 2 diabetes (29,52). Recommended guidelines for children and adolescents range from 60 min of daily physical activity in the United States (61), United Kingdom (16) and Australia (17,18) to 90 min in Canada (27). However, reports indicate that 90% of Canadian children and adolescents are not meeting these guidelines (11). Similarly low levels of habitual physical activity have been documented among U.S. and British children and adolescents (2,39,58). For instance, 58% of U.S. children and 92% of adolescents are not meeting these guidelines (58) A large international study found the proportion of youth aged 10–16 years who were physically active for at least 60 min, at least 5 days of the week, was below 50% for all 34 countries examined; the lowest being 19.3% in France (30). Therefore, understanding the determinants of physical activity among children and adolescents is necessary to design effective interventions (46,62).

The determinants of physical activity involve many individual, social, and environmental factors (44,45,51). More recently, associations between physical activity and the physical and built environment have been explored. For example, access to facilities/programs/parks, neighborhood safety, time outdoors, and exercise equipment in the home have all been shown to be associated with physical activity among children and adolescents (19,46,47,59,62). However, the influence of aspects of the natural environment such as seasons and weather on physical activity among children is less understood (31). Seasonal variation of physical activity can

Carson and Spence are with the Sedentary Living Lab, Faculty of Physical Education and Recreation, University of Alberta, Edmonton, Alberta T6G 2H9, Canada.
be defined as a fluctuation in physical activity levels that is associated with changes in weather and daylight hours that accompany different seasons. In the northern hemisphere, we may expect that children and adolescents will be more physically active in the spring and summer months (March to August) than the fall and winter months (September to February) as warmer temperatures and longer daylight hours may encourage more outdoor play and activities. In the southern hemisphere, we would expect to observe the same pattern except that the months will be reversed with the spring and summer months falling in the September to February period.

Though a review recently found seasonal variation in physical activity among humans (60), it did not have a specific focus on children or adolescents. As a result the bulk of studies reviewed involved adults and many key studies involving children and adolescents were not included. Furthermore, the review did not examine moderating variables that may have been unique to children and adolescents (e.g., age, type of physical activity measure). Because children are not just little adults, it is unreasonable to assume that changes in seasons may have the same influence on physical activity patterns among children as observed for adults. Seasonality is important to study in children and adolescents because patterns of inconsistent physical activity participation may carry over into adulthood (36). As well, if children are not active year round their fitness levels will most likely decrease and therefore they will not enjoy the beneficial health outcomes associated with physical activity (5,36). Thus, interventions may need to be modified according to seasons as more opportunities and programs for children and adolescents may be required at different times of the year. Therefore the purposes of this review were to examine seasonal variation in physical activity among children and adolescents and determine the role of potential moderators such as region, age, physical activity measure, and research design.

**Method**

To obtain articles for the review, a computer search of PubMed, Google Scholar, and Sport Discus was conducted. The search terms used were “seasons”, “weather”, “physical activity”, “exercise”, and “energy expenditure”. The review ended February 15, 2009. The abstracts of articles located in the initial search were reviewed for relevance. To be included in the review, studies needed to be published in English, include samples of either children and/or adolescents between the ages of 2–19 years, and report results for measurements of physical activity or energy expenditure in more than one season or month. Of the 914 abstracts initially reviewed, 46 appeared to fit these criteria and journal articles were located and more thoroughly reviewed. Of those, 18 articles were kept and 28 were dropped (21 were on adults only, 6 were not relevant, and 1 was a qualitative study). The bibliographies of all reviewed articles, including a previously published review on seasonal variation (60), were then searched and 16 more journal articles were located and thoroughly reviewed. Of those, 4 were dropped (2 were on adults only and 2 were not relevant). Finally, 5 new relevant articles were published during the review process. Therefore, a total of 35 relevant articles were coded with some overlap across age groups. The entire review process involved both authors and any differences of opinion were resolved. The following characteristics were recorded for all 35 articles: author, year, age, sample size, country, design, physical activity measure (e.g., questionnaire), definition of season, and finding. As well, most and least active seasons or months were recorded (see Table 1).
### Table 1  Seasonality of Physical Activity Among Children and Adolescents

<table>
<thead>
<tr>
<th></th>
<th>Summer</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Month/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baranowski et al. (3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nov./Dec. = 1; Jul. = 4</td>
</tr>
<tr>
<td>Males</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td></td>
</tr>
<tr>
<td>Beighle et al. (4)</td>
<td>NM</td>
<td>4</td>
<td>1</td>
<td>NM</td>
<td></td>
</tr>
<tr>
<td>Belanger et al. (5)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Benefice et al. (6)</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>Rainy = 1; Dry = 4</td>
</tr>
<tr>
<td>Bitar et al. (7)</td>
<td>NM</td>
<td>ND</td>
<td>NM</td>
<td>ND</td>
<td>NM</td>
</tr>
<tr>
<td>Booth et al. (8)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Burdette et al. (10)</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>NM</td>
</tr>
<tr>
<td>Carson et al. (12)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Coe et al. (13)</td>
<td>NM</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Crocker et al. (14)</td>
<td>NM</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Duncan et al. (20)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Finn et al. (22)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>NM</td>
</tr>
<tr>
<td>Fisher et al. (23)</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>NM</td>
</tr>
<tr>
<td>Garcia et al. (24)</td>
<td>NM</td>
<td>NM</td>
<td>4</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Goran et al. (25)</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Hagger et al. (26)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Huang et al. (28)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Kristensen et al. (31)</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Kristensen et al. (31)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>NM</td>
</tr>
<tr>
<td>Loucaides et al. (32)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Lunt et al. (33)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Mattocks et al. (34)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Poest et al. (36)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Riddoch et al. (39)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Ridgers et al. (40)</td>
<td>ND</td>
<td>NM</td>
<td>ND</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Rifas-Shiman et al. (41)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Ross et al. (42)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Ross et al. (42)</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>NM</td>
</tr>
<tr>
<td>Rowlands et al. (43)</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Santos et al. (48)</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Shephard et al. (49)</td>
<td>NM</td>
<td>1</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
</tr>
<tr>
<td>Smith et al. (50)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Tremblay et al. (57)</td>
<td>ND</td>
<td>ND</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Vermorel et al. (63)</td>
<td>NM</td>
<td>4</td>
<td>NM</td>
<td>1</td>
<td>NM</td>
</tr>
<tr>
<td>Wennlof et al. (64)</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>April/May = 1</td>
</tr>
</tbody>
</table>

Note. 1 = Most active; 2 = Second most active; 3 = Second least active; 4 = Least active; NM = Not measured in the study; ND = No difference.
A detailed review table is available upon request from authors.
Results

Included studies were published between the years 1980–2009 and represented 39,010 participants ranging from 16 to 11,892 participants per study. The studies were conducted in 12 different countries (Canada, United States, England, Scotland, France, Portugal, Cyprus, Denmark, Sweden, Australia, New Zealand and Senegal). Overall, 83% (29/35) of the studies found seasonal variation in physical activity among children and/or adolescents (3–6,8,10,12–14,20,23–26,28,31–34,36,39,41–43,48,49,63,64; see Table 1). The age of the samples varied with some studies focusing on a specific age group (e.g., preschool children) while others spanned various age categories. A variety of techniques were used in the measurement of physical activity and approximately half the studies used a repeated-measure design while the other half used a cross-sectional design.

Region

The impact of seasonal variation can depend on the region where children reside. For example, seasonal variation might influence the behavior of children in regions that experience extremely cold temperatures and short daylight hours in the winter differently than those in regions that do not experience such dramatic changes in temperature and daylight. The majority of studies conducted in the European region did in fact find seasonal variation in children’s physical activity with higher levels of activity occurring in the spring/summer months compared with the fall/winter months (22,26,31,32,34,39,43,48,63,64). For example, children in England had lower physical activity levels in the winter compared with other seasons (26,34,39,43).

Similar conclusions can be drawn for the North American region. Physical activity was highest in the spring/summer and lowest in the fall/winter among studies conducted in the United States (4,10,13,24,25,28,36,41,42) and Canada (12,14,49). Although, Baranowski et al. (3) found seasonal variation through direct observation of 191 children in Texas was the exact opposite. Outside activities of children were lower during the summer months, with the lowest level occurring in July.

Among studies conducted in the southern hemisphere, seasonal variation was also found with higher levels of physical activity occurring in the summer than the winter (8,20,33). For example, children and youth between the ages of 5–18 years were more active in the summer (December to February) compared with the winter (June to August) in New Zealand and Australia (8,20,33). Benefice and colleagues (6), reported higher levels of physical activity during the rainy season, in comparison with the dry season, among 40 girls in Senegal.

However, in both the European and North American regions several studies reported no significant seasonal differences in children’s and/or adolescents’ physical activity levels (7,22,31,40,50,57). For example no seasonal differences in moderate to vigorous physical activity (MVPA) and vigorous physical activity (VPA) were found in a sample of English children during recess between summer (June) and winter (November; 40). Similarly, inactivity among children in the winter months was not significantly different in comparison with other months in Vancouver, Canada (50).

Another variant of regions is the distinction between rural and urban areas. For instance, more time was spent playing outside in the summer in both rural and
urban settings in Cyprus among 11 and 12 year-olds (32). However, rural school children were significantly more active than urban school children in the summer. On the other hand, urban school children were significantly more active than rural school children in the winter. Similar results were seen in Canada, where rural children were more active in the summer compared with fall and urban children were more active in the fall compared with the summer (57).

**Age**

The studies in this review included children and/or adolescents ranging from 2–19 years. Because younger children are known to be more active than older children (11,45), we examined whether age had any influence on seasonal variation of physical activity. The World Health Organization defines adolescents as the period roughly between 10 to 19 years old (65). However, many of the samples included participants ranging across child and adolescent age groups. Therefore, we looked for natural breaks among samples and identified three age groups that the majority of studies could fit into. The young age group encompassed children less than 6 years old, the middle group included children and adolescent between 8 and 12 years old, and the older age group encompassed adolescents over the age of 12. There were 6 studies that examined seasonal variation exclusively in the young age group (3,10,12,22,23,36). The findings on seasonality of physical activity are not clear for this age group. For example, seasonal variation was found in children aged 4–5 years in Edmonton, Canada where the highest levels of physical activity occurred in the summer and the lowest in the winter (12). As well, physical activity was significantly lower in spring (February–April) compared with summer (May–July), autumn (August–October) and winter (November–January) among 3–6 year-olds in Scotland (23). However, it was concluded in the latter study that the differences were not practically significant and seasonality in physical activity was relatively unimportant. No seasonal variation was observed among 3–5 years olds in South Dakota (22). As well, Baranowski and colleagues found seasonal variation in outdoor physical activity but little variance was seen in indoor physical activity (3).

Seasonal variation in children and adolescents primarily between the ages of 8–12 years was examined in 14 studies (13,24,26,28,31,32,34,39,40,42,43,49–51). The findings for this age group are clearer as 79% (11/14) of studies found seasonal variation (13,24,26,28,31,32,34,39,40,42,43,49). For example, physical activity among 9–10 year-olds was significantly lower in the winter than any other season in Massachusetts (28). Similarly, physical activity was the lowest in the winter for 11–12 year-olds in England (34,39), Cyprus (32), and the United States (13). Further, 83% (5/ 6) of studies found seasonal variation in the older age group (5,6,8,33,63). Of the studies that did not fit mainly in the middle or older age category, 89% (8/9) reported seasonal variation in physical activity (4,14,20,25,41,42,48,64).

**Physical Activity Measure**

Seasonal variation may also depend on the measurement tool used. Assessing physical activity in children can be challenging as the behavior is spontaneous, sporadic and of short duration (1,34,55). As well, children may lack the cognitive ability to recall activity accurately (1,34,43,55). Furthermore, proxy reports by parents or teachers are limited to adult’s opportunities to observe the child being physical
active (55). Direct measures (e.g., pedometers, accelerometers) are thought to offer more accurate and robust estimates of physical activity (1). A recent systematic review found considerable disagreement and low to moderate correlations between direct and indirect measurements (1). Thus, when examining an outcome such as seasonal variation, it is important to consider the measurement tool being used. For example, Burdette and colleagues found seasonal variation among 2.5–4.5 year-olds when physical activity was measured by proxy reports from parents, however when accelerometers were used seasonal variation was less pronounced (10).

A large proportion of studies examining seasonal variation among children and adolescents used direct measures in the form of accelerometers, pedometers, heart rate monitors or direct observation (3,4,6,7,10,20,22,23,25,31,32,34,39,40,43,57,64). However, among the studies reviewed, seasonal variation was present regardless of the type of physical activity measure used. Seventy-three percent (13/18) of studies using direct measures and 94% (16/17) of those using indirect measures found seasonal variation in physical activity. For instance, children who wore accelerometers for 7 consecutive days in England were most active in the summer and least active in the winter (34,39). Similarly, adolescents who wore pedometers for 3–4 consecutive days in Sweden were most active in the spring months of April and May (64). Based upon responses to a questionnaire, participation in organized and nonorganized sport was highest in the spring/summer period in Portugal (48). Of the studies that did not find seasonal variation, 5 used direct measures (7,22,31,40,57) while 1 used indirect measures (50).

**Design**

Cross-sectional designs measure physical activity among different children and adolescents in each season. Therefore it is possible, especially in studies with smaller sample sizes, that seasonal differences are the result of differences in the characteristics of children and adolescents being compared. Thus, a repeated-measure design should be the stronger of the two as the same children and adolescents are being measured across seasons. However, caution should be taken when interpreting the results of this type of design because differences in physical activity between measurements may be caused by growth and maturation of the child. Specifically, over a period of 3–6 months young children can experience substantial changes in fine and gross motor skills that may enhance their ability to engage in physical activity (23). Whereas in adolescence, a time when physical activity has been shown to decrease (1), a period of 3–6 months could be marked by declines in physical activity (5). Approximately half the studies used a repeated-measure design (3–5,13,14,24,26,32–34,40,41,43,49,50,57) while the others used a cross-sectional design (7,8,10,12,20,22,23,28,31,36,39,42,43,48,63,64). Regardless, the design of the study did not appear to impact the results of seasonal variation. Eighty-two percent (14/17) of studies using a repeated-measure design (3–5,13,14,24,26,32–34,41,49), and 83% (15/18) using a cross-sectional design, found seasonal variation in physical activity (8,10,12,20,23,25,28,31,36,39,42,43,48,63,64). For example, a cross-sectional study in the United States found the average days per week children spent in physical activity varied between seasons (28). Similarly, when accelerometers were worn for 7 consecutive days in the summer and the winter in England, children were more active in the summer (39). Of the studies that reported no seasonal
seasonal variation, 3 were cross-sectional designs (7,22,31) and 3 were repeated-measure designs (40,50,57).

**Discussion and Conclusions**

After our review of the literature it does appear that seasonal variation of physical activity may exist among older children and adolescents in many different geographic locations. The results are consistent regardless of the physical activity measure or the study design. However, the evidence for seasonal variation among younger children (2- to 6- years old) appears less clear. In fact, research on physical activity among preschool children is very limited (56), despite the fact overweight is becoming more common in preschool children in many parts of the world including Canada and the UK (37,38,56). The preschool years have been identified as a critical period for growth and acquisition of motor skills that are needed to be physically active throughout life (56). Recently, physical activity guidelines have been developed for children under the age of 5 years in the United States (35), preschoolers (3–5 years of age) should accumulate at least 60 min daily of structured physical activity. However, national guidelines for physical activity among preschool children is limited in other countries (56). Thus, more research is needed on what constitutes an appropriate level of physical activity for very young children and the factors that influence participation in this age group. Therefore, it is important to understand if seasonality impacts all age groups, or if the impact occurs later on when children begin to have more autonomy from their parents in terms of play and activities.

Several studies in this review report no significant seasonal differences in children’s and adolescent physical activity levels (7,22,31,40,50,57) and one study actually recorded lower physical activity levels in the spring/summer period (3). There are several possible explanations for these discrepancies. For example, it may not be reasonable to expect to observe seasonal variation in physical activity in locations with mild winter temperatures (40,50). However, two studies one in South Dakota and one in Saskatchewan, locations characterized by extremely cold winter conditions (21), reported no seasonal differences in physical activity (22,57). Potential limitations, that may lead to questions about the reliability of these findings, is that activity monitors were only worn for 2 days instead of the recommended 4 days for children in South Dakota (1) and winter was not measured in the Saskatchewan study. Since regions such as South Dakota and, Saskatchewan experience extremely cold temperatures in the winter more research is needed on seasonal variation of physical activity in regions characterized by extreme climates. Finally, the observation that activity levels were lowest in July in a study conducted in Texas was likely due to extremely hot temperatures in the summer (3). Therefore, activity levels may only be higher in warmer months to a certain threshold of temperature. Once average temperatures go beyond the threshold, then the extreme heat may impact children’s activity levels in a similar manner as extremely cold temperature do. It is also possible that the discrepancy in this study is due to differences in measurement methodology, as this was the only study in the review that used direct measurement to assess children’s physical activity levels (1). Regardless, this further emphasizes the point that additional research is need in locations characterized by extreme cold and hot climates.
Being outdoors was a significant predictor of physical activity levels in three of the studies (3,10,32). Play is an important source of physical activity among children (53). This has implications for regions that experience extreme temperatures in the winter and summer. However, Beighle and colleagues (4) speculated that children may still be active in colder weather if they experienced longer daylight hours. The authors found students measured in the spring experienced an additional 3.5 daylight hours compared with students in the winter. Similarly, there was additional 2 hr of daylight when children in Cyprus were measured in the summer compared with the winter (32). Thus, temperature and reduced daylight hours may reduce outdoor play which could limit children’s opportunities for physical activity.

Another interesting finding was the interaction between season and rural/urban regions among youth’s physical activity levels (32,57). In two different parts of the world, rural youth were more active in the warmer months and urban youth were more active in the colder months. A review conducted on the correlates of physical activity of children and adolescents found associations between physical activity and urban/rural environments were inconsistent and concluded more research is needed is this area (46). Loucaides and colleagues speculated youth in rural areas were more active in the summer because they spent more time outside due to greater access to larger, safer spaces (32). But, in the winter when the temperatures were colder and daylight hours were shorter, urban youth had more access to exercise equipment at home and a wider selection of sport facilities than rural youth (32). These findings suggest that when planning physical activity interventions for youth, both the time of year and the geographic location may influence the effectiveness of the intervention.

The main focus of this review was seasonal variation in physical activity; however day-to-day variation in weather within seasons can also have an impact on physical activity. Though either may be a barrier to physical activity (54) and active commuting to school for youth (15), little research exists on the direct effects of meteorological variables on physical activity levels among youth (5,9,20). Some studies in the review that did not find seasonal variation took place in locations with little variation in temperatures and weather between seasons (40,50). However, seasonal variation of physical activity was reported in similar locations in other studies reviewed (26,34,39,43). This suggests that although weather appears to be an important factor, other factors may also be associated with seasonal variation. One study in the review that looked at both seasonal and weather variation concluded that daily fluctuations in weather did not have as much impact on adolescents’ physical activity compared with the effect of month or season. As day-to-day variation in weather impacted unplanned activities more than planned activities (5). Regardless, more research is needed examining weather variation in physical activity among children and youth.

In summary, the majority of studies reviewed found that seasonal variation exists for physical activity among children and adolescents. As the seasons become more extreme in temperature, especially colder, children and adolescents were less likely to be physically active. These variations in physical activity were observed in countries such as England, Scotland, Canada, and the United States even though these countries have traditions around engaging in winter activities (e.g., skiing and ice hockey). Although another recent review found seasonal variation in physical activity among humans (60), only 13 of the 37 reviewed studies focused specifically on seasonal variation of physical activity among children and adolescents.
Therefore, our review synthesized the findings of a further 22 studies on the topic for a total of 35. Furthermore, the previous review did not examine moderating variables that may have been unique to children and adolescents (e.g., age, physical activity measure).

Our findings have important implications for the design of physical activity interventions, the provision of programs for children and adolescents, and for the monitoring/surveillance of physical activity. Specifically, a single measurement occasion will not adequately characterize children’s and adolescents’ usual physical activity. One study in the review reported increases in activity in the warm seasons did not balance the decreases in physical activity seen in the colder seasons among adolescents resulting in a 7% decrease in activity per year (5). If physical activity varies by season, children and adolescents may lose the health benefits associated with physical activity when not participating in it year round. As well, these patterns of inconsistent physical activity participation along with yearly decreases may continue on into adulthood. Therefore, parents, teachers, and community recreational programmers should be aware of seasonal variation and take it into consideration when working with, or caring for, children and adolescents.

References