

Frequency of preschool children's outdoor physical activity and relations to body mass index and motor performance

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Background

Children today in most industrialized countries are growing up in altered living conditions compared to previous times. Due to the trends of urbanization, motorization and rapid technological progress, children spend less time actively playing in natural surroundings and more time passively consuming audio-visual media – this may lead to an increasing alienation from nature (San Jose & Nelson, 2017). Moreover, sedentary behavior potentially results in overweight and poor motor performance.

Whereas the positive effects of physical activity in general are well documented, physical activity in an outdoor natural environment may lead to additional positive effects. For example, outdoor physically active children have a lower risk for developing chronic illnesses and physical activity in natural environments was found to be associated with a lower risk of poor mental health (Thompson Coon et al., 2011). Importantly, Wells and Lekies (2006) point out that the number of hours spent outdoors in childhood is the most important factor associated with people's long-term environmental attitudes and behaviors. Frequent experiences in nature during childhood predict higher levels of physical activity in natural environments in adulthood (Calogiuri, 2016). Therefore, it may be a public health issue to bring children back to nature as early and as often as possible.

The present study aims at the question, how frequent preschool children are physically active outdoors and if there are relations of the frequency being active outdoors to body mass index and motor performance.

Methods

Presented data originates from different health promotion projects conducted in preschools in Cologne, Germany (Klein et al., 2015). Relevant cross-sectional data is available for $n=799$ children (44.7% girls, 55.3% boys). Mean age of participating children was 4.7 ± 0.9 years, mean height was 108.3 ± 7.9 cm, mean weight was 19.1 ± 3.6 kg and mean body mass index was 16.1 ± 1.6 kg/m².

First, anthropometric data of the children were collected in a standardized procedure and the body mass index was calculated in kg/m². Afterwards, a motor screening with five test items covering relevant motor abilities (the "KiMo test") has been conducted (Klein et al., 2012). Parents completed a questionnaire, one question aiming at the weekly frequency their children were physically active outdoors beyond the time spent in preschool. Possible answers were "daily", "on 4-6 days" or "on 1-3 days".

Descriptive statistics are shown as mean values and standard deviations. Relations between the categorical variables “gender” and “frequency of physical activity outdoors” are tested by the chi²-test. Differences between the groups (“daily”, “on 4-6 days”, “on 1-3 days”) regarding body mass index and motor performance are calculated by analysis of variance (ANOVA).

Results

48.6% of the children were active outdoors on a daily basis, 38.2% on 4-6 days and 13.3% on 1-3 days per week. No gender-specific differences ($p=0.132$) and no differences in age ($p=0.904$) occurred related to outdoor activity.

The body mass index did not differ between children being active outdoors every day or less, neither in total ($p=0.095$) nor regarded separately for girls ($p=0.815$) or boys ($p=0.076$). Motor performance did not differ due to the frequency of outdoor activity in the test items “shuttle run” ($p=0.303$), “standing long jump” ($p=0.662$), “sit and reach” ($p=0.830$) or “lateral jumping” ($p=0.861$). Children being active outdoors on 4-6 days per week achieved the best results in the test item “one leg stand” compared to children being active outdoors on a daily basis or on 1-3 days ($p=0.017$).

Conclusions

The present study shows that nearly half of the German preschool children are active outdoors on a daily basis and additionally more than one third on 4-6 days per week. It clearly has to be stated as a limiting factor that neither the duration nor the quality of the activities have been assessed. This also may be one explanation, why no relations could be detected between the frequency of outdoor activity and the body mass index as well as the results concerning motor performance in 4 out of 5 test items. Only in the test item “one leg stand” (representing balance) differences in favor of children being active outdoors on 4-6 days could be proven. One explanation may be that preschool children take the opportunities to balance that outdoor surroundings offer (like overturned trees or curbstones).

Another explanation of missing relations between the frequency of outdoor activity and the body mass index as well as motor performance may be the fact that numerous factors are associated to the development of overweight and poor motor performance. Being active outdoors is just one parameter of many that are expected to be significant (like nutrition and physical activity in general). Moreover, the present study has been conducted in the urban area of a metropolis. The physical activity of inhabiting children may often take place in closed rooms like gyms. Finally, parents self-reported the frequency of their children’s outdoor activity by questionnaire. In this context social desirability of the answers has to be taken into account.

In summary, it is an encouraging result that a considerable amount of preschool children is active outdoors on at least every second day up to daily, even in an urban metropolitan area. Regarding the numerous positive health effects of being physically active, that may be increased if the activity takes place in a natural outdoor environment, it is a public health issue to promote outdoor activities of children. Future concepts for the management of natural resources for recreation should account for options for outdoor physical activity of preschool children.

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