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Abstract

The association of physical activity level with respiratory tract infections frequency among preschool children

On a multi-national scale upper respiratory tract infections (URTIs) are the most commonly quoted causes for individuals of preschool children to visit a general practitioner. Several factors have been held responsible for children's increased susceptibility to frequent respiratory infections especially: having siblings, allergies, second hand tabaco smoking, air pollution. The role of physical activity (PA) in children in this regard has not been described in detail so far.

The aim of this PhD study was to determine whether there is a correlation between the frequency of respiratory tract infections and the level of physical exercise (average daily step count) in a cohort of preschool children.

Firstly, we designed and published a study protocol, study assessing PA and daily upper respiratory infection's symptoms in group of preschool children. For the purposes of the future study, the tool for assessing the symptoms of URTIs - Wisconsin Upper Respiratory Symptom Survey for Kids (WURSS-K) - was translated into Polish and validated. Then, a study was performed to assess the relationship between the level of PA and the occurrence of respiratory infections. One hundred and four participants aged 4–7, were included. PA and sleep duration was measured by the Garmin vivofit pedometer. URTI symptoms were monitored and evaluated using the Polish version of the WURSS-K.

Results showed that the average daily step count from healthy days was a significant determinant of the total number of days with the URTI symptoms in 40 days observation period. The severity of the URTI's symptoms depended on daily step count. The level of PA accounted for 44% ($p < 0.001$) of this variable variance, confirming that the occurrence of URTI symptoms in preschool children was inversely associated to the degree of PA. Moreover the

lag effect analysis of PA levels and the risk of URTI allowed to conclude that low initial level of PA (initial 14-day “run-in” observation period) was associated with a significant increased risk of URTI.

Additionally, we separately analyzed group of children who participated in sport activities regularly (3 or more hours per week) and showed that they had significantly less URTI symptoms than children who did not regularly practice in sports. No significant correlation was found between sleep duration and the number of URTI days.

The results of this study confirm previous observations in other age groups that regular PA significantly influence the frequency and severity of URTIs. We suggest that daily physical activity may contribute to improve immunity in prevention of seasonal infections in children.