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Original Article

PHYSICAL ACTIVITY OF CHILDREN TRANSITIONING FROM KINDEGARTEN TO PRIMARY SCHOOL: A PILOT STUDY

ATIVIDADE FÍSICA DE CRIANÇAS EM TRANSIÇÃO DA EDUCAÇÃO INFANTIL AO ENSINO BÁSICO: UM ESTUDO PILOTO

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RESUMO

Esta pesquisa foca na diminuição da atividade física (AF) à medida que as crianças passam da educação infantil para o ensino básico, destacando a importância de ambientes escolares de apoio e da influência dos pais na manutenção da AF. O estudo observou 43 crianças inicialmente na pré-escola e depois em ambientes escolares, medindo sua AF durante os dias escolares usando pedômetros digitais e dois questionários autoconstruídos. A análise da pesquisa piloto incluiu análise do fator de inflação da variância, análise de componentes principais, regressão linear múltipla, coeficiente de correlação de Spearman e teste de Wilcoxon. O estudo indica uma redução de 22,7% na AF das crianças ao fazerem a transição do jardim de infância para a escola primária, ressaltando o impacto significativo dos ambientes escolares. O impacto do estilo de vida familiar no número de passos durante os dias escolares não foi comprovado. Com base no estudo, os ambientes escolares e as atividades estruturadas impactam crucialmente a AF das crianças, levando a uma diminuição significativa durante a transição da educação infantil para o ensino básico. Há uma necessidade urgente de ações, iniciativas e políticas para promover a AF dos alunos durante os dias escolares.

Palavras-chave: Educação infantil, Ambiente escolar, Dia de aula, Transição escolar, Rotina de atividade física, Contagem de passos.

ABSTRACT

This research focuses on the decrease in PA as children transition from kindergarten to primary school, underscoring the importance of supportive school environments and parental influence in maintaining PA. The study observed 43 children initially in preschool and later in school settings, measuring their physical activity (PA) during school days using digital pedometers and two self-constructed questionnaires. The pilot study used variance inflation factor analysis, principal component analysis, multiple linear regression, Spearman's correlation coefficient and Wilcoxon signed-rank test to identify differences and key predictors. The study indicates a 22.7% decrease in children's PA upon transitioning from kindergarten to primary school, highlighting the significant impact of school environments. Family lifestyle's impact on school-day step count was not proven. Based on the study school environments and structured activities crucially impact children's PA, leading to a significant decrease during the transition from kindergarten to primary school. There is an urgent need to take all possible actions, initiatives and policies to promote pupils' school-day PA.

Keywords: Preschool education, School environment, School day, School transition, Physical activity regime, Step counts.

Introduction

The global scientific community underscores the crucial role of PA in the well-being of children and adolescents[1–3]. PA contributes to health-oriented fitness and physical fitness, as demonstrated in motor tests, correlates with the overall amount of PA per week. Physically fit students are more active in both physical education (PE) lessons and school breaks, resulting in higher overall weekly PA level[4]. Health recommendations advocate a minimum of 60 minutes of daily moderate-to-vigorous physical activity (MVPA)[1]. Gomes[5] highlights that a significant majority of adolescents (80.3%) worldwide fall short of meeting these guidelines. Children who are overweight in kindergarten face a higher risk of obesity during adolescence, and the percentage of overweight and obese children tends to rise as they get older[6]. The data highlight the importance of early targeted interventions to encourage replacing sedentary time with activities that cause children to pant and sweat, beginning in kindergarten and continuing through their school years[7]. The findings suggest that higher levels of VPA in pre-school age,

if maintained throughout childhood, may support the development of healthy body composition and aerobic fitness levels in later childhood[8].

Another benefit of sufficient PA is the impact on mental health in youth[9] and also impact on the process of education. Associations have been identified between PA and the dimensions of school engagement, including behavior (e.g., time-on-task), emotions (e.g., lesson enjoyment), and cognition (e.g., self-regulated learning, executive function), but also academic achievements (e.g. grades and test scores)[10–14]. Evidence is increasing to suggest that students who are physically active are more engaged with their classroom lessons[12,15,16] and there is a reduction of off-task classroom behavior and improvement of on-task classroom behavior[17]. While some authors question a direct correlation between PA and academic achievements, Taras[18] suggests short-term improvements in concentration but challenges the evidence for long-term academic gains from vigorous PA. Studies using observation measures report a large positive association between PA and school engagement, while subjective measures show a small positive association. Overall, PA has a small positive association with school engagement but no association with school disengagement[19].

The Report Card on Physical Activity for Children and Youth in the Czech Republic highlights a notable percentage of Czech children and adolescents failing to meet PA guidelines, supplied by high levels of excessive sedentary behavior[20]. For effective changes and improvement of PA in children the key issue is to understand the factors that influence it. Hu[21] identified support from friends, parents, and teachers, as well as availability of facilities and safe environments as the key predictors.

From the point of view of family and parents' influence on children's PA the research presents a mixed picture. Petersen[22] highlights the influence of parental behavior, whereas Trost[23], Bauman[24] and a meta-analysis by Pugliese and Tinsley[25] did not find correlation. Yao and Rhodes[26] identified a moderate effect. The impact of family on child's PA changes with age. In the preschool age, the model behavior of parents and their support play a key role, but with age this may decrease while peer influence increases. Overall, it appears that parents' support is related to the level of PA and also perception of this support by the children[25–28].

Some of the other factors include predictors from the area of environmental impacts such as opportunities for PA in school, access to facilities for PA and weather influenced children's time spent on PA and the types of activities they engaged in[29]. Studies consistently show a positive correlation between children's outdoor time and overall PA[30–32].

In addition to family, friends, conditions, and environment, schools play a crucial role in children's PA. The organization of the school day is particularly significant. Children in activity-permissive school environments exhibit significantly higher levels of movement compared to those in traditional school settings[33,34]. Another aspect related to organization of the school day to consider is the availability and use of sports facilities and equipment, as they impact the duration and types of physical activities for children. The provision of game equipment during recess notably enhances children's MVPA levels[21,29,35–37].

Other important factor is quality and quantity of PE lessons. Increasing the time dedicated to PA at school through extra PE lessons positively affected children's body mass[36]. It is important that allocating up to an additional hour per day of curricular time to PA programs does not affect the academic performance of primary school students negatively, even though the other subjects usually show a corresponding reduction[19].

In the Czech Republic there seems to be significant changes in the level of children's PA after transitioning from preschool age and preschool facilities to the first grade of primary school[38]. According to Brazendale[39] as well as according to Roscoe[40], school children are more active during the school days and preschool children are most active during weekdays, whereas Sigmund[38] points out to a decrease in PA during the week, especially during school lessons. Duncan[41] finds out that children are more active on weekdays than during weekends, but also

that lunchtime appears to be an important source of daily PA. It can be thus assumed that in preschool age, children move more on weekdays whereas school students move more on weekends or on schooldays when they "catch up" on PA during breaks, e.g. during lunch break. This signifies low support for PA on weekdays spent in school (excluded lunch time). Other studies point out to higher PA of preschool children compared to adolescents and young adults[42]. Usually, the younger the children the more is their natural need for exercise. It can be also said that the older the children the more support for their PA is needed.

The research design is a quantitative non-interventional survey using pedometers and structured questionnaires to determine the circumstances of children's PA. The research, with features of a longitudinal design, tracks changes in children's PA as they transition from kindergarten to primary school and analyses these changes. Based on the analysis of the literature review, two alternative hypotheses are established: H1: "The transition of selected children from kindergarten to primary school leads to a reduction in their physical activity during the school day." H2: "School environment and conditions have a significant effect on children's level of physical activity."

Methods

Sample and Procedures

To deliver the goals of the pilot study, quantitative measurement was applied using inSPORTline Strippy digital pedometers and two questionnaire surveys. The total number of the children involved in the pedometer measurement was 52. The measurement was completed by 43 pupils (21 girls and 22 boys) and the measuring period covered 5 days in May 2022 measuring children as kindergartners and 5 days in October 2022 measuring the same children as first grade primary pupils. The measurement took place within a standard kindergarten and school time range from 7:30 AM till 2:00 PM. The pedometers were attached to the children's ankles or wrists in accordance with the manufacturer's instructions.

Three kindergartens and three primary schools were selected by deliberate selection. Chosen conditions were a very similar or identical daily routine in terms of children's PA and the status of a regular public kindergarten. All the selected school facilities were in the Olomouc region of the Czech Republic, in a location with similar characteristics in terms of geography and city size. The selection of primary schools was made on the basis of a questionnaire survey designed for first grade classroom teachers in the selected region. The questionnaire was self-constructed. It focused on the so-called passive and active school conditions for PA of the fourth pillar of the document "Active School"[43]. Among the passive conditions, the questionnaire asked about the size of the school, the number of floors, sports facilities and equipment, their availability to pupils, and the length of the long recess. From the active conditions, we investigated the frequency of the implementation of lessons outside the school building, the inclusion of learning in motion and the organization of physically active breaks. Following the results of the questionnaire, three primary public schools with different conditions for PA of pupils were selected.

For final data collection self-constructed questionnaires designed specifically for the purpose of this study were used. The questionnaire was addressed to the parents of the children and was aimed to determine the family's lifestyle, the pupil's exercise regime and personal characteristics with a potential link to the pupil's PA. It was designed to capture specific aspects of children's PA and lifestyle that are relevant to the transition from kindergarten to primary school. The questionnaire items were based on current knowledge in the field of children's PA and included questions focused on the child's temperament, his/her tendency to spontaneous PA, his/her leisure time interests, and participation in sports clubs, sports skills and abilities and other regular sports activities. Also whether the family practices active transportation to school,

whether they implement family seasonal sports activities, and whether there is a competitive athlete in the family. The following questionnaires served as inspiration for the development of the individual survey items: Physical Activity Questionnaire for Children (PAQ-C)[44], International Physical Activity Questionnaire (IPAQ) – Short Form[45] and Family Eating and Activity Habits Questionnaire[46]. Content validity was assessed by gathering input from subject matter experts in the relevant field. Experts were invited to review the questionnaire items for clarity, relevance, and alignment with the research objectives.

To increase the robustness and generalizability of our results, cross-validation and sensitivity analysis were applied. For cross-validation of regression models we used 10-fold cross-validation to evaluate the prediction models. The data were divided into 10 groups, and the model was trained on 9 groups and tested on the remaining group. For the sensitivity analysis, we used several scenarios in which we varied the ranges of key variables such as child temperament, school conditions and family. The aim was to see how these changes affect the prediction of the number of steps. This analysis helped us identify which variables had the greatest impact on the results and how robust the results were to changes in the data.

Data cleaning and statistical analysis

The sourced data was processed using a publicly accessible statistic software Jeffrey's Amazing Statistics Program (JASP), version 0.17.3. Multiple linear regression was applied to identify significant predictors of PA. Prior to applying the regression model, the data were standardized and a variance inflation factor (VIF) analysis was performed to identify and address multicollinearity issues between variables. Variables with high VIF values (above 10) were considered potentially problematic. As a result of the high VIF values, Principal Component Analysis (PCA) was used to reduce the dimensionality of the data and create new variables (principal components) that represent the original dataset without multicollinearity. After applying PCA, multiple linear regression was performed to identify significant predictors of PA, represented by the number of steps. In this analysis, principal components were used as independent variables to model the relationship with step count as the dependent variable.

Spearman's Correlation Coefficient and Wilcoxon signed-rank test were calculated to assess monotonic relationships between variables. This nonparametric method was chosen for its robustness with respect to data that may not be normally distributed or may contain outliers.

This study approaches the analysis of children's PA using complex statistical modeling, which involves addressing multicollinearity using PCA and then using principal components as predictors in a regression model. This approach allows for a deeper understanding of the relationships between school environment, family lifestyle and children's PA.

Ethical Considerations

This study adhered to the ethical principles outlined by the Declaration of Helsinki and was approved by the Ethics Committee of University of Hradec Králové. The following key ethical considerations were addressed:

Informed Consent: Detailed information about the study's purpose, procedures, potential risks, and benefits was provided to the parents or guardians. Consent forms were signed to ensure voluntary participation.

Anonymity and Risk Minimization: All data collected was anonymized. The use of digital pedometers and questionnaires was non-invasive, and the activities conducted were part of their usual daily routines.

Right to Withdraw and Child Welfare: Participants and their guardians were informed of their right to withdraw from the study at any point without any consequences. Researchers

were trained to monitor the children's responses and ensure a supportive and positive environment during data collection.

Review and Approval: The research protocol, including the informed consent process and data management plans, was reviewed and approved by the Committee for Research Ethics at the University of Hradec Králové, ensuring that all ethical standards were met.

By incorporating these ethical principles, the study aimed to uphold the highest standards of research integrity and participant protection.

Results

The average number of steps per one child per the five-day period in the kindergarten was 35554 steps. Average number of steps per one child per the five-day period in the first grade of the primary school was 27470 steps. It is a statistically significant difference (at the level of significance of 0.01). In primary school, the same children walked on average 22.7 % less steps than they walked in kindergarten. A Wilcoxon rank-sum test was conducted to compare the number of steps in primary school and kindergarten children. The results show a statistically significant difference in the number of steps between the two groups ($W=474$, $p<0.001$), with higher median number of steps for kindergarten children. Rank-Biserial Correlation $r=0.487$ indicates a moderately strong relationship between school type and number of steps. Fig. 1 shows the distribution of sums of the steps and it is apparent that in primary school there is greater variance and variability besides the lower overall number of steps walked by pupils. There is statistically significant difference between the measures.

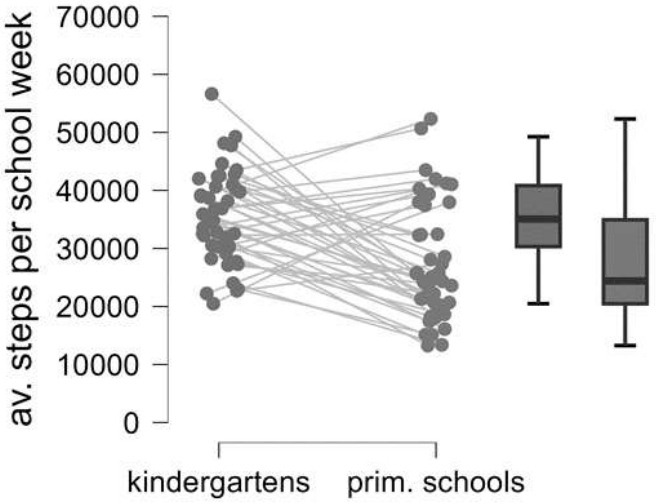

Figure 1. The difference in the weekly sums of steps children take after transition from kindergarten to primary school - shown in two different form**s**
Source: Authors

Figure 2 shows the differences in the number of steps individually per each of the school.

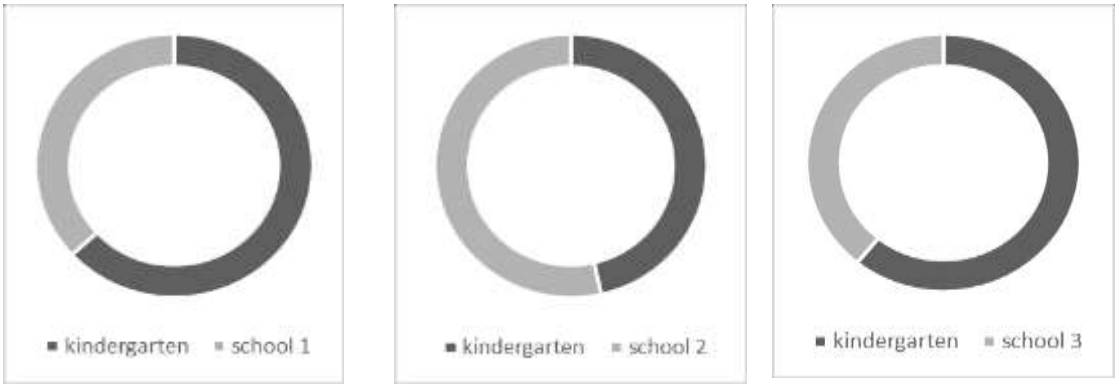

Figure 2. Amount of steps taken by children before and after the transition from kindergarten to primary school 1, 2 and 3.
Source: Authors

Children who transitioned from kindergarten to schools 1 and 3 experienced a significant drop in their PA as recorded by the pedometers. Pupils, who transitioned to school 2, were the only ones to increase their number of steps.

To comment on alternative hypothesis H2: "School environment and conditions have a significant effect on children's level of physical activity." PCA was applied to help disentangle the effects of each of the variables of interest. PCA was applied to the standardized variables to create principal components, which were then used as independent variables in the regression model. PCA revealed four principal components that together explain approximately 98% of the total variability in the data. After applying PCA, multiple linear regression was performed to identify significant predictor of PA, which turned out to be the child's temperament with a coefficient (β) of 6801.08, a standard error of 1571.56, a T-value of 4.328, and a P-value of less than 0.001. This indicates a significant relationship between a child's temperament and their level of PA, measured by the number of steps taken. Children with higher levels of extroversion or a greater tendency towards spontaneous activity showed higher step counts, highlighting the need to take individual differences into account when designing interventions aimed at increasing PA. The regression analysis found that family lifestyle ($\beta = 241.25$, $p = 0.706$) and having an athlete in the family ($\beta = 3592.21$, $p = 0.161$) did not significantly affect children's physical activity levels. This means that children's PA at school may have other dominant influencing factors than family environment or family lifestyle.

Integrating the results of the regression analysis with the findings from the Spearman correlation coefficient calculation provides a more robust view of the dynamics affecting PA. While the regression analysis provided quantitative estimates of the influence of individual factors, the Spearman coefficient complemented this insight by revealing the strength and direction of monotonic relationships between variables. Correlations between PA and School Environment Factors shows Tables 1.

Table 1. Spearman's correlations of School conditions, Family lifestyle, Child's activity, Sport skills, Gender, Tendency to spontaneous PA and Step counts.

Variable	Steps	Variable	Steps
Active school conditions	0.56***	*Passive conditions*	0.77***
Temperament	0.47**	*Family lifestyle*	0.13
Sports skills	0.01	*Sports participation*	0.01
Child activity	0.13	*Tendency to spontaneous PA*	0.11
Gender	-0.20	*Age*	-0.14

Notes: $p < .05$, ** $p < .01$, *** $p < .001$
Source: Authors

Where correlations did not emerge was between step counts and family life style (0.13) (athlete in the family, implementation of regular seasonal physical activities, and active transport to school). Low or no correlation came out with age (0.14), gender (-0.2), and tendency to the spontaneous movement (0.11).

The mean squared error (MSE) for the 10-fold cross-validation was -29,962,522.07 with a standard deviation of 27,781,812.64. Sensitivity analysis revealed that changes in temperament, family summary score and passive and active school conditions affected the predicted value of steps. This approach provides deeper insight into the influence of key variables on outcomes.

The graphs below illustrate how changes in selected variables affect the predicted average number of steps, allowing us to observe the variations at different values.

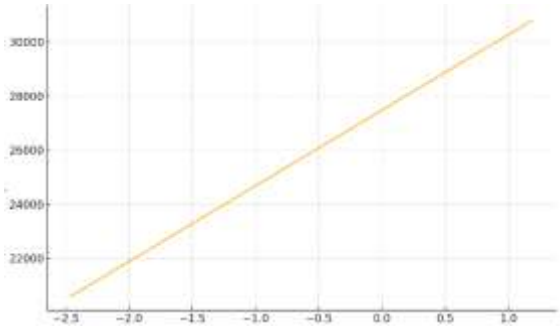

Figure 5. Sensitive analysis (SA): the impact of temperament on step counts.
Source: authors.

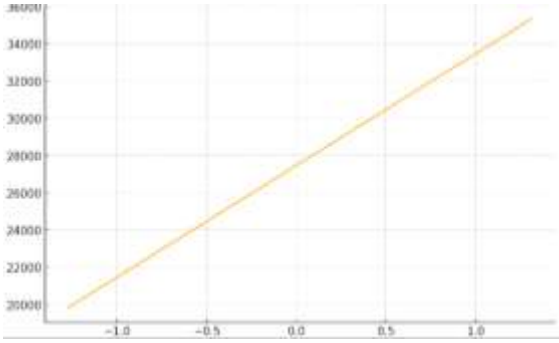

Figure 6. SA: the impact of passive school conditions on step counts.
Source: authors.

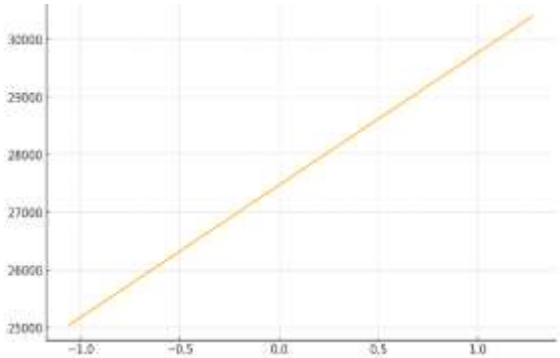

Figure 7. SA: the impact of active school conditions on step counts.
Source: authors.

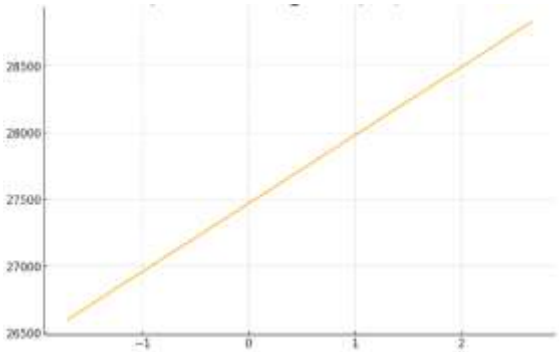

Figure 8. SA: the impact of family conditions on step counts.
Source: authors.

Child temperament was shown to have a significant effect on the predicted number of steps, suggesting that children with different temperamental levels may exhibit varying levels of PA. The influence of passive school conditions underscores the importance of the school environment in shaping children's PA levels. Similarly, the impact of active school conditions highlights the significance of available sports equipment and organized activities in promoting PA. Although the influence of the family environment and lifestyle on children's PA was also evident, the slight slope of the curve suggests a statistically insignificant result in the regression analysis.

In the final summary of the results we can say, that the most important factor affecting children’s PA appears to be the passive conditions of the school environment, as indicated by Spearman’s correlation coefficient of 0.77. Closely following are active conditions. This finding emphasizes that the school environment and temperament of pupils play a crucial role children’s PA during the school day.

Based on the results we cannot reject both alternative hypothesis:

H1: “The transition of selected children from kindergarten to primary school leads to a decrease in their physical activity during the school day.”

H2: “School environment and conditions have a significant effect on children’s level of physical activity.”

Discussion

On the observed sample, we found that a child's PA in terms of steps walked per week in kindergarten is 35554 on average, whereas in primary school it is 27470. That is a statistically significant difference with 22.7% decrease. The results thus confirm a significant decrease in children's PA during the transition from kindergarten to primary school, e.g. in line with the results of Sigmund[38] or Sacheck et al.[47] Sacheck et al.[47] also note that MVPA decreases during the primary school years, and prolonged periods of sedentary behavior highlight the need for more opportunities for movement throughout the school day.

Studies by Ferreira et al.[30] and Haug et al.[35] highlight the importance of the environment and availability of sports equipment on youth PA levels, supporting our findings on the influence of active and passive school conditions. When children are provided with appropriate PA facilities and organized activities at school, their MVPA increases significantly, as also reported by Verstraete et al.[37]. This is supported by our findings that children who transfer to schools with active PA-supportive environments show a smaller decrease or even increase in steps.

Analysis of the individual school cases shows that in children who transitioned from kindergarten to primary school 1 their PA decreased by 34 %, in children in school 2 it increased by 10 %, and in children in primary school 3 it decreased by 45 %. The observed primary school with the highest amount of steps supports the requirement for school-based PA interventions helping to reduce sedentary time. In combination interventions may be effective in increasing students' daily MVPA[48] and their overall PA[49]. Proven influence of the school environment on pupils' PA is in accordance with studies that emphasize the importance of facilities and equipment – their quantity, availability, and mode of use as a condition for higher PA of children[21,29,36,37]. Access to playgrounds, gymnasiums, and outdoor facilities impacts students' PA during school breaks[5,35]. Where appropriate material equipment was provided, children's moderate and intensive PA during lunch break increased from 38 to 50 %. During morning breaks, the children's moderate PA increased from 41 to 45 %[37].

Another way of increasing students' PA in school is through extra PE lessons[36] and it is important that allocating up to an additional hour per day of curricular time to PA programs does not affect the academic performance negatively[50]. Although the research did not focus on school engagement and academic achievement, these are the areas in which changes are observed based on the degree of students' PA[10,11,13,14,17].

The results of school 2 corresponds e.g. with the results of Aadland[51], who described a higher PA of children on weekdays than on weekends, during school day than during free time, and after transition to primary school compared to the preschool period. These examples of good practice provide a good model for quality in terms of PA during a school day. It should be kept in mind that children's PA and body composition have a significant impact on physical fitness during the transition from preschool to school. The document 'Common Features of Primary and Secondary Schools with Physically Fit and Physically Weak Pupils'[52] identifies key factors that distinguish schools with high levels of PA from those with low levels. Our findings that an active school environment and the availability of sports facilities significantly influence children's PA are consistent with these common features. The paper reports that schools with physically fit pupils tend to have better equipped sports facilities, more PE lessons and actively encourage pupils to engage in PA during breaks and after school.

The importance to make changes affecting the school environment towards the support of PA is very important, among other things because there is no doubt whether school conditions (passive and active) have an impact on students' PA.

At the same time, certain degree of doubt persists regarding the influence of family. The research showed that the lifestyle of the family has almost no influence on the measured number

of the child's steps in the school (correlation 0.13), which is consistent with the research of Bauman[24] and of Pugliese and Tinsley[25]. In free time, where freedom of movement and expression is greater, the activity of a child is significantly related with the lifestyle of the family, which is in line with the findings of this study - overall activity of the child and the lifestyle of the family showed more significant correlation (0.54). This supports the findings of Petersen et al.[22] and the commonly held assumption that family lifestyle has an impact on children's overall activity. However, this influence does not necessarily manifest itself during school days. This suggests that the school environment plays a crucial role in terms of PA during a school day. This finding is important for the design of interventions aimed at improving the school environment because it shows that also children from less active or disadvantaged families or backgrounds can achieve higher levels of PA at school.

Studies by Yao and Rhodes[26] and Pugliese and Tinsley[25] further confirm the importance of temperament and individual differences in PA levels. Children with higher levels of extroversion or a greater tendency towards spontaneous activity show higher step counts. Our analyses show that temperament is a significant predictor of PA, which is crucial for designing personalized interventions that account for individual differences between children. Increased levels of PA may also contribute to better school performance, as reported by Taras[18], although some studies, such as Trudeau and Shephard[19], suggest that the effect of PA on academic achievement may be limited.

The data supports the relevance of early targeted interventions to promote sedentary time replacements by activities that make children to pant and sweat, already at kindergarten age and also after entering school. It appears that replacing only couple of minutes of non-active time with more energetic activities at preschool age has further advantageous effect on body composition 12 months later at school age[6]. Especially increasing vigorous-intensity activities parallel with reducing sedentary behaviors are the possibilities to improve body composition, and particularly the physical fitness already in 6- to 8-year-old children[7]. Future research should focus on assessing both constructs of PA and sedentary behavior independently, as they do not necessarily need to be mutually exclusive[53]. Research findings suggest that higher levels of MVPA in pre-school age, if maintained throughout childhood, may support the development of healthy body composition and aerobic fitness levels in later childhood[8].

Overall, this study highlights the importance of promoting PA in the school setting and the need for strategic interventions aimed at increasing PA during the school day. Our findings support the need for changes in the school environment, which should include improving the availability of sports equipment, organizing physically active recess, and other interventions aimed at increasing PA levels in children. The responsibility for the necessary changes rests on the shoulders of teachers, schools, their founders, politicians, but also of the educators of future teachers.

Future research should include longer follow-up periods and qualitative methods that could provide deeper insights into children's experiences and motivations.

Limitations

We acknowledge several limitations that may have impacted our findings. Firstly, the small sample size of 52 children, influenced by limited resources and the study's focus on a specific educational setting, may have restricted the statistical power and generalizability of our results. However, this allowed for a more detailed follow-up of each participant, providing important baseline information and insights into the dynamics of PA during the transition period. The questionnaires, specifically designed for this study and not pilot tested, might have introduced social desirability bias. Future research should use validated instruments or pilot test new tools. The geographical limitation of conducting the study in the Olomouc region of the Czech Republic may affect the transferability of the results to other areas. The PA

measurements, taken over a limited period of five days, may not capture the full variability in children's activity levels across different seasons or longer periods. Study primarily used quantitative methods, lacking qualitative data that could provide deeper insights into children's experiences and reasons behind changes in activity levels. Including interviews or focus groups in future research could enrich these findings. While we examined school environments and family lifestyle, we did not consider other external factors like community programs or socio-economic status. Lastly, the short-term nature of this pilot study limits our ability to draw conclusions about long-term trends in PA during the transition from kindergarten to primary school. Longitudinal studies are needed to understand the sustained impact of this transition on PA levels.

Conclusion

The study's findings highlight a significant decrease in PA, measured by steps, as children transition from kindergarten to primary school, with an average reduction of 22.7%. The variance in PA among different schools suggests environmental factors play a crucial role, supported by statistical analyses revealing that both passive and active school conditions significantly affect PA levels. In contrast to the temperament of the child, the influence of the family does not appear to be significant in terms of pupils' PA at school. Neither are sport skills, pupil participation in sport activities, tendency to spontaneous PA or gender.

The study underscores the importance of school environments in supporting children's PA, which is particularly important for children from disadvantaged families or backgrounds, affirming the hypotheses that school transitions affect PA and that environmental conditions are significant determinants of PA levels. It is therefore the role of the school to provide the maximum possible quantity of PA and thus contribute to regular lifetime and voluntary implementation of PA, i.e. to influence the student's physical literacy level. For greater changes in children's PA it is necessary to take action on all levels of the educational process and its management.

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