

INFLUENCE OF HOME ENVIRONMENT SIZE ON MOTOR PROFICIENCY OF PRESCHOOL CHILDREN

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Abstract

Environmental influence is important to child motor development. It is well documented how early motor stimulation or deprivation affects motor and cognitive development of a child (Santrock, 2009). Recently, great number of research shows also that different environmental settings have impact to physical activity of children and adolescents. The purpose of this paper is to determine how home physical environment size is associated with children's motor proficiency. Sample of subjects consisted of 259 preschool children and their parents from three kindergarten institutions in Croatia's capital city. Testing was conducted in two parts. In first part parents filled out a socio-demographic questionnaire and in the second motor skills and abilities of children were tested. Main results of this research show that living area size (Mean value 92,11m²) is significantly correlated to child's motor proficiency ($r = 0.16$), while yard area size (Mean value 343,58m²) was not significantly correlated ($r = 0.12$). Values of both coefficients indicate, although for house area size significant, that the correlation is poor. The explanation for results in our study can be that most children are physically active and developing motor skills away from the home environment (parks, playgrounds, etc.). More studies of environment correlates of physical activity and motor skills in children and youth are needed.

Introduction

Process of development occurs according to the pattern that is established by the genetic potential and also by the influence of environmental factors. Environmental influence is important to child motor development. It is well documented how early motor stimulation or deprivation affects motor and cognitive development of a child (Santrock, 2009). Child's family plays a leading role in its development. Factors, such as the family's socioeconomic status, mother's educational level and the existence or the absence of siblings affect children's development (Venetsanou & Kambas, 2010). Permissive, accepting families, providing a healthy effective environment and plenty of opportunities for perceptual-motor experiences help their children's development. Preschool centers with adequate equipment and appropriate care, as well as a specific pedagogic methodology for the age group, provide more opportunities for an appropriate development of children's motor abilities. Apart from schooling, the society in which a child lives forms a specific cultural context that favors certain aspects of motor development (Venetsanou & Kambas, 2010). Recently, great number of research shows also that different environmental settings have impact to physical activity of children and adolescents. In children potential determinants of higher physical activity are father's physical activity habits, school physical activity related policies and time spent outdoors (Ferreira et al., 2007). In this review, the other variables association's with physical activity, like home and neighborhood physical environment, were inconsistent or not possible to infer from the limited number of existing studies (Ferreira et al., 2007). Cools and associates (2011) determined that environmental risk factors such as the prosperity index of the municipality, type of housing, and street traffic of the home environment were not directly associated with preschool children's fundamental motor skills.

The purpose of this paper is to determine how home physical environment size is associated with children's motor proficiency.

Methods

Subjects

Sample of subjects consisted of 259 preschool children and their parents from three kindergarten institutions in Croatia's capital city. Parent signed written informed consent for each child to participate in this study. Research was conducted in accordance with Declaration of Helsinki and was approved by Institutional Ethical Board.

Testing protocol

Testing was conducted in two parts. In first part parents filled out a socio-demographic questionnaire and in the second motor skills and abilities of children were tested. Questionnaire consisted information on physical living environment,

parents determined living area size and yard area size in square meters. Prior to motor testing, verbal information and demonstration was given to a child and he/she had one non-recorded trial. We used Bruininks-Oseretsky Test of Motor Proficiency – Second Edition (BOT2) to measure motor skills and abilities of children. Test is suited for children from 4 up to 21 years of age and measures motor precision, motor integration, ambidexterity, manual coordination, balance, bilateral coordination, speed, agility and strength. The test result is standardized overall motor score, with very good reliability (0.86 do 0.89)(Cools et al., 2009).

Statistical procedures

Data was processed in Statistica 13.2. (Statsoft, Inc., Tulsa, OK, SAD). Correlation between variables of home environment and motor skills of children was determined using Pearson coefficient of correlation. Level of statistical significance was set to $p < 0.05$.

Results and discussion

Main results of this research show that living area size (Mean value 92,11m²) is significantly correlated to child's motor proficiency ($r = 0.16$), while yard area size (Mean value 343,58m²) was not significantly correlated ($r = 0.12$). Values of both coefficients indicate, although for house area size significant, that the correlation is poor. Mean values of overall standardized score (BOT2=52,19±8,24) show average motor proficiency of Croatian capital city preschool children. We presumed that children that live in larger houses or flats have more space for movement and greater level of motor skills. Furthermore, we presumed that having larger yard and outside area to play would potentiate greater motor proficiency. It seems that size of living space and outside yard area is not related to motor proficiency of preschool children. One previous study suggested that children who had limited physical environments at home demonstrated low levels of activity, with over 80% of time at home spent lying, sitting or standing (Johns and Ha, 1999). Given many parents' concerns about children playing outside due to safety reasons, the home environment may be an important setting in which to target physical activity behaviors, and development of basic motor skills (Hume et al., 2005). In parent's reports, availability of play spaces and frequency and time spent playing outside were very important correlates to child's physical activity (Sallis, 1993; Ferreira et al., 2007).

According to the distribution of movement of children in different environments by Dunton and associates (2012) most of children's physical activities is carried out in the open spaces away from home (42%), followed by children physical activity at home (indoors) (30%), in the yard at home (8%) or at somebody else yard (8%), in the gym and recreation centers (3%), and elsewhere (9%). Children's physical activity was pronounced while with more people (friends and the family) (39%), followed by family members (32%), independent (15%) and finally with friends (13%). All three kindergarten in our research are located in the City of Zagreb where some of children is living in small apartments and do not have a yard. It seems that having a yard or a flat of different size does not make a difference for a child's motor proficiency. In a study conducted in England with greater number of participants (6,497 children) no significant difference was found between the yard characteristics and physical activity (Pouliou et al., 2014). The explanation for this and results in our study can be that most children are physically active and developing motor skills away from the home environment (parks, playgrounds, etc.).

Several studies have identified aspects of the built environment that are related to adult physical activity (see Norman et al., 2006). The few studies examining this association in children have demonstrated that time spent outdoors was associated with observed physical activity and that preschool centers with larger indoor play areas (20.4 steps per minute) tended to have higher step counts than centers with smaller indoor play areas (18.2 steps per minute)(see Trost et al., 2010). Research of Sallis and associates (2001) indicated a possibility that school area size, equipment availability and adult supervision could affect child's physical activity. Their results implicate that making realistic improvements to school environments could increase the physical activity of children throughout the school day. When the school environment had high levels of physical improvements, the percentage of physically active boys and girls was 4-fold higher (Sallis et al., 2001). Based on previous studies it was reasonable to hypothesize that a child's immediate surroundings may play a role in influencing their physical activity and skills. Within the broader neighborhood, environmental factors such as living in an apartment block with a courtyard, living near a park and the age of the neighborhood were positively associated with children's independent mobility (Prezza et al., 2001). Furthermore, the number of play spaces near children's homes, and the amount of time children used those play spaces were positively associated with activity levels (Norman et al., 2006). In our research, majority of the parents (97%) indicated their satisfaction on playground area near to their house, so children had opportunity to be active. Although, the difference in living space conditions and backyard area did not reflect the children's motor proficiency. In our research, children who have availability and larger inside and outside play areas, do not have greater motor skills as a result of potential greater physical activity. In research of Norman and associates (2006) built environment variables explained only 2% to 3% of the variance in physical activity. More studies of environment correlates of physical activity and motor skills in children and youth are needed.

Conclusion

When consistent correlates are identified, it will be useful to estimate the number of youth exposed to environments in risk and to develop strategies to ensure that young people grow up in environments that make it easy and safe for them to be physically active (Norman et al., 2006). To increase children's physical activity it may be important to create child friendly communities, and provide skills to safely negotiate the environment (Timperio et al., 2006). The challenge for researchers and practitioners wishing to promote motor skills, physical activity and prevent obesity in preschool children is to identify which policies and what types of environments best promote regular physical activity in child care and home settings.

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