Int. J. School. Health. 2022; 9(3)

Published online 2022 July.

Original Article

Effects of Playground Availability on Participation of Children in Physical Activity: The Role of Socioeconomic Status

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Received March 08, 2022; **Revised** May 13, 2022; **Accepted** June 02, 2022

Abstract

Background: A possible influential factor in participation of physical activity can be playground availability. The current study aimed to assess the effects of playground availability on participation of children in physical activity, considering parental socioeconomic status as a mediator.
Method: This study employed a cross-sectional method based on structural equation modelling. We recruited 384 children (145 girls, mean age of 11.92±1.72 years) from primary schools in Tehran, Iran in 2021. They completed the questionnaires related to playground availability, physical activity, and parental socioeconomic status. For data analysis, we used structural equation modelling.
Results: Generally, the physical activity of our sample was low (2.24±1.35). Both playground availability (T=9.129) and parental socioeconomic status (T=6.564) had significant effects on children participation in physical activity. Moreover, parental socioeconomic status has not significantly mediated the association between playground availability and children participation in physical activity (β=0.221, P=0.684).
Conclusions: These findings indicated that playground availability and socioeconomic status of parents affect children participation in physical activity; however, these factors do not necessarily work together to strengthen children participation in physical activity.

Keywords: Children, Park and playground availability, Physical activity, Socioeconomic status

How to Cite: Abdoshahi M, Ghorbani S. Effects of Playground Availability on Participation of Children in Physical Activity: The Role of Socioeconomic Status. Int. J. School. Health. 2022;9(3):186-191. doi: 10.30476/INTJSH.2022.96051.1245.

1. Introduction

Engagement in physical activity (PA) is assumed as an important determinant of physical and mental health among children. Physical activity refers to any body movement with the help of muscles and bones which requires energy expenditure (1-3). PA may be done as part of recreational activities, operating sports, active transportation, or family sports (2, 3). Research has shown that regular PA is associated with numerous fitness benefits such as advanced cardiorespiratory and muscular health, strong bones, better memory characteristics and cognitive management, and reduction in depressive symptoms, and obesity (1, 4-10). Furthermore, it has been reported that PA at early ages can have an effect on the level of PA in the course of adulthood and public health in advance (11, 12). Hence, World Health Organization (WHO) released recommendations for doing at least 60 minutes of moderate-to-vigorous PA (MVPA) on a daily basis (13). On the other hand, research has indicated that nowadays, people, due to modern lifestyle, tend to have a sedentary life, which is also evident in children; for example, numerous studies have documented that only 20-40% of children meet WHO guidelines (14, 15). The studies in Iran have also found that a small percentage of Iranian children meet WHO guidelines for daily MVPA (16-21). Accordingly, physical activity for children has become a key topic in research on sport and health over the past decades. A great deal of research has tried to find out the influential factors on children participation in PA.

A vital factor associated with their participation in PA is the proximity of parks and playgrounds. In fact, being outside provides the opportunity to have further physical activity and can have a vital influence on PA pattern of youth. Children would like to spend most of their time outside since many games cannot be done in their rooms. Large spaces in parks and playgrounds in neighborhoods can facilitate many physical and sport activities, even

with higher intensities. Outdoor spaces, such as parks and playgrounds, could provide children with greater opportunities for being physically active. As a result, proximity to neighborhood parks and playgrounds must be available for children to facilitate doing physical activity. It may not necessarily increase PA in youth, but can provide them with possibilities for being more active in these environments. While proximity to parks and playgrounds is an important factor influencing PA of children, there are very few studies on the effects of environmental built on children participation in PA; for instance, Reimers and Knapp (22) found that the number of children using the playgrounds and the number of children actively playing in them were higher in those with more varied facilities and without naturalness. Moreover, girls performed greater in terms of PA in playgrounds without multi-motive regions. Floyd and colleagues (23) additionally stated that environmental features of parks were associated with interest rates while neighborhood characteristics were not. Molina-García and colleagues (24) found that the number of parks and playgrounds were positively associated with MVPA among children. Ultimately, An and co-workers (25) confirmed that availability of and accessibility to greenspaces, parks, recreational centers, and sidewalks in proximity are associated with extended PA ranges amongst youth. While the mentioned studies have clearly shown the positive effects of proximity to neighborhood parks and playgrounds on participation of children in PA, there are a number of issues that need to be addressed; for example, it is not well understood whether parents' socioeconomic status can play a role in the association between proximity to neighborhood parks and playgrounds and children participation in PA. Numerous studies have shown that children with decreased socioeconomic popularity are at higher risk of obesity and are exposed to home and community environments which can be unconducive to health-promoting behaviors (26, 27). Other papers have indicated that parental socioeconomic status directly affects participation of children and adolescents from different age groups in PA and sports (28, 29). Accordingly, it seems essential to survey whether parents' socioeconomic status plays a role in the association between closeness to neighborhood parks and playgrounds with PA. Therefore, the current study aimed to investigate the associations between proximity to neighborhood parks and playgrounds and PA among children by considering parental socioeconomic status as a mediator.

2. Methods

This study employed a cross-sectional method based on structural equation modelling. The protocol of this survey was reviewed and confirmed by institutional ethics committee with the code of IR.IAU.AK.REC.1398.001. Our participants voluntarily attended this study whose parents subscribed written informed consent.

2.1 Participants

Our sample included 384 children (145 girls, mean age of 11.92±1.72 years) from Tehran, Iran in 2021, who were selected based on convenience sampling method. In the present research, the inclusion criteria were studying in primary and elementary schools in Tehran, being healthy without any physical or mental disorders, and providing written informed consents. A student was excluded from the study when he/she had not completed questionnaires.

2.2 Measures

2.2.1 Playground availability: Perceived availability of community game facilities was defined as sport grounds (indoor/outdoor), bike/walk lanes, table tennis courts, or swimming pools within a five-minute walk from home. Tehran is a densely populated city, with high levels of land use mix, in which people are very likely to have access to services near to their house. Hence, a 5-minute walking distance was used to define neighborhood boundaries. Children answered to this question as "Yes" or "No".

2.2.2 Physical activity: PA was measured with the Physical Activity Behavior in Leisure-Time Scale (19), together with three questions scored based on an eight-point Likert scale from zero days (0) to seven days (7). In this study, 10 experts confirmed the validity of the Persian model of this questionnaire (CVI=0.90, CVR=0.88). Moreover, we measured the reliability of this instrument with a Cronbach's alpha coefficient of 0.90.

2.2.1 Parental socioeconomic status: To measure parental socioeconomic status consisting

of parents' education level and household income, we used parental socioeconomic status scale (28). Accordingly, we asked the parents about the details of their highest education degree and their annual household income. Subsequently, they were divided into three categories, namely low (score 1), medium (score 2), and high (score 3) educational level and low (score 1), medium (score 2), and high (score 3) household income (28). The total score was obtained by calculating the average scores of educational status and income. As such, a score between 0 to 1 represented low, 1 to 2 medium, and 2 to 3 high parental socioeconomic status. In this study, 10 experts confirmed the validity of the Persian model of this questionnaire (CVI=1.00, CVR=1.00). In addition, Cronbach's alpha of this questionnaire was 0.88.

2.3 Data Analysis

Descriptive data were provided using means and standard deviations. Pearson chi-square test was applied for measuring bidirectional associations. Finally, structural equation method was used via Lisrel to investigate the impacts of playground availability on children participation in PA by the mediating role of parental socioeconomic status. The level of significance was considered at the alpha level of 0.05.

3. Results

3.1 Descriptive Data

The participants were 384 children (145 girls, mean age of 11.92±1.72 years) from Tehran, Iran in 2021. Table 1 shows the results of descriptive statistics regarding the study sample. It is seen that the mean of PA of our sample is lower than average, indicating the low level of PA in children. Moreover, 85% of our participants reported a playground available just near their house (5 minutes away from their house). Additionally, children's parental socioeconomic status is mostly at a medium level based on Table 1.

Table 1: Descriptive data of our sample

Variables	**Mean±SD**	
Age (years)	11.92±1.72	
BMI	19.93±1.58	
Physical Activity	2.24±1.35	
	Yes	**No**
Playground Availability	85%	15%
Parental Socioeconomic Status	**N**	**Percentage**
Low	65	17%
Medium	286	74%
High	33	9%

3.2 Bidirectional Relationships

We observed a significant direct association between playground availability and PA (X^2=19.617, P<0.001). Moreover, there was a significant direct association between parental socioeconomic status and PA (X^2=17.290, P<0.001).

3.3 Structural Equation Modeling

Table 2 and Figure 1 illustrate the results of structural equation modeling. As shown, playground availability has a significant effect on PA (T=9.129). Moreover, parental socioeconomic status had a significant effect on PA (T=6.564).

Table 2: Results of path analysis between research variables

	Path	**β**	**T value**
1	Playground Availability=> Physical Activity	0.582	9.129
2	Parental Socioeconomic Status=> Physical Activity	0.467	6.564
		Z	**P value**
3	Playground Availability=> Parental Socioeconomic Status=> Physical Activity	0.221	P=0.684

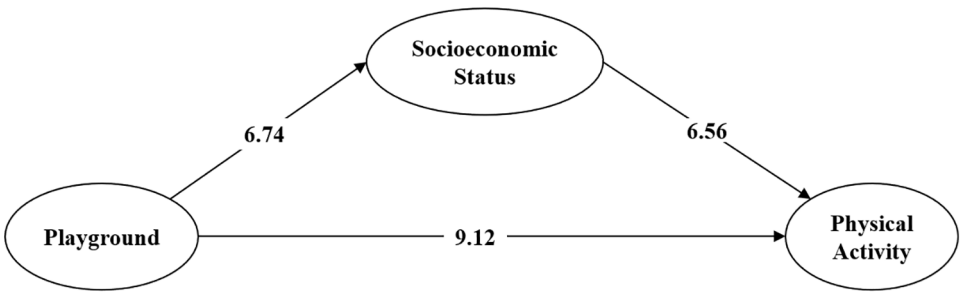

Figure 1: The figure shows the results of path analysis in the form of T values.

Parental socioeconomic status does not significantly mediate the association between playground availability and PA (P=0.684). The results of model fit showed that our research model had a good fit (RMSEA=0.05; X^2/df=2.82; RMR=0.02; NFI=0.98; CFI=0.98).

4. Discussion

Generally, we found that both playground availability and parental socioeconomic status had significant effects on participation of children in physical activity. Specifically, we found that our sample was engaged in an almost low amount of PA, which is in line with past research (16-20), indicating that children do not follow the WHO guidelines of daily PA. Owing to the numerous benefits of regular PA, it is vital to discover strategies to boost the level of PA amongst youth.

Regarding playground availability, we found that proximity to park and playground had significant effects on PA in children. Our findings confirmed those reported by previous studies, suggesting that neighborhood playgrounds positively affect engagement of youth in PA (22-25). Therefore, it can be said that proximity to parks and playgrounds is associated with enhanced PA engagement of youth. Our findings also supported social cognitive theory (30); that is environmental factors influencing participation of children in PA. According to the present findings, it is necessary to improve the availability of local exercise facilities in society. Governments should impose a few rules and construct new exercise facilities (community fitness centers, parks, roadside open spaces with exercise equipment). They also need to facilitate the accessibility of the existing facilities (extend the operating hours of school gyms/playgrounds and opening them to the public).

Concerning parental socioeconomic status, the results showed that it significantly affects PA among children. However, it did not significantly mediate the association between playground availability and engagement of youth in PA. The present findings confirmed the results of previous studies indicating positive effects of parental socioeconomic status on PA participation among children (26-29); nonetheless, playground availability and parental socioeconomic status do not necessarily work together to boost the level of children's participation in PA.

4.1. Limitations

The limitation of this study was that we utilized self-report questionnaires for measuring the research variables. The use of devices for measuring the variables in this study may provide more validated data.

5. Conclusions

Using a cross-sectional design, we found that our sample did not have enough PA. Moreover, playground availability and parental socioeconomic status positively affect the participation of children in PA; however, they do not necessarily work together to improve youth engagement in PA. Based on these findings, one may suggest that playground availability and socioeconomic status of parents are critical factors playing role in children's PA. Hence, it seems to be essential to improve the availability of parks and playgrounds as well as the level of socioeconomic status of parents.

Ethical Approval

This research was approved by University Ethics Committee with the code of IR.IAU.AK.REC.1398.001. All students voluntarily attended in this study and written informed consent was obtained from the teachers, students, and parents.

Acknowledgments

We are grateful to all students and their parents who participated in this study.

Conflict of Interest: None declared.

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