

# Research on the Relationship Between Family Factors and Physical Activity Level of Young Children Based on Social Cognitive Theory

Deepa Shukla<sup>1,2</sup>, Ravi Jagadish<sup>1\*</sup>

<sup>1</sup>Faculty of Sport Science and Coaching, Universiti Pendidikan Sultan Idris, Malaysia

<sup>2</sup>School of Physical Education and Health, Zhaoqing University, China

\*ravijagadish@fsskj.upsi.edu.my

**Abstract:** *This study aims to explore the influence of family factors on the physical activity levels of young children from the perspective of Social Cognitive Theory. By measuring the physical activity levels of 229 young children in Guangzhou, Foshan, and Zhaoqing, China, and analyzing the survey results from their parents, this study examines the impacts of parental awareness, parental behavioral support, parental psychological support, and the family physical activity environment on children's physical activity levels. The results indicate that parental awareness ( $\beta=0.167$ ,  $p=0.033$ ), parental behavioral support ( $\beta=0.186$ ,  $p=0.021$ ), parental psychological support ( $\beta=0.259$ ,  $p=0.001$ ), and the family physical activity environment ( $\beta=0.371$ ,  $p<0.001$ ) all significantly positively predict the physical activity levels of young children. The overall explanatory power of the model is 42.9% (adjusted  $R^2=0.408$ ), suggesting that family factors play a crucial role in promoting physical activity among young children. The study recommends that enhancing parental awareness, strengthening parental behavior and psychological support, and improving the family physical activity environment can significantly elevate the physical activity levels of young children. This research provides empirical evidence for developing family - based strategies to promote physical activity in young children.*

**Keywords:** Social Cognitive Theory, family factors, physical activity levels in young children, relationship

## 1. Introduction

The World Health Organization's "Guidelines on Physical Activity, Sedentary Behavior, and Sleep for Children Under 5 Years of Age (2019)" identify a lack of physical activity as a major risk factor for global mortality and a driving force behind the increase in overweight and obesity [1]. Numerous studies have confirmed that insufficient physical activity is the fourth leading risk factor for death globally, following high blood pressure, smoking, and high blood sugar [2]. Inadequate physical activity not only affects the physical development of young children but also impacts their psychological state, cognition, sleep quality, and bone health [3].

Despite extensive research confirming the benefits of physical activity, insufficient physical activity among children and adolescents has become a global trend, with 81% of this group globally not meeting the daily recommended levels of physical activity [4]. The situation in China is even more severe, with about 60% of children and adolescents not meeting these recommendations [5]. Moreover, there is a notable decline in the physical activity levels of children and adolescents as they age, hindering their future healthy growth. Since the late 1980s, the number of overweight and obese individuals in China, especially among preschool - aged children, has rapidly increased [6]. According to data from the General Administration of Sport of China (2015), the

health level of children and adolescents has continued to decline in recent years, with the morbidity rate of urban preschool children estimated at 6% to 14% [7]. This is closely linked to the lack of physical activity caused by modern lifestyles and family upbringing methods. The range of health problems caused by insufficient physical activity in young children has drawn significant national and social attention. Enhancing the physical activity levels of young children and improving their physical health is not only a crucial measure in implementing the "Healthy China" strategy and the construction of a "Sport Powerhouse" but also a social reality that requires proactive responses.

Young children are at the educational enlightenment stage of their lives, and the family is the birthplace of their early education. The family environment plays a significant role in the growth of young children. Social Cognitive Theory suggests that behavior changes are influenced by cognition and environment [8]. On one hand, children aged 3 - 6 years do not yet possess complete cognitive abilities, and their behavior is largely controlled by parental cognition; on the other hand, most family environmental variables have direct (non - mediatory) and indirect (mediatory) relationships with children's participation in sports. Parents significantly influence children's sports behavior, which can be direct or indirect, intentional or unintentional. It is necessary to implement family - based physical activity interventions, focusing on parental awareness, parental support, and the

family environment to encourage children's participation in physical activities.

## 2. Survey Participants and Research Methods

### 2.1 Survey Participants

The sample size for quantitative research can be determined by the type of statistical analysis used for data analysis. According to previous studies, a sample size of 200 to 500 is typically used in SEM applications, with larger sample sizes yielding more reliable results [9]. Furthermore, according to international scale principles, the sample size should be at least five times the number of items on the scale [10]. The sample size for this study was determined based on the above analysis.

#### 2.1.1 Young Children

A total of 240 children were randomly selected from kindergartens in the surveyed areas, including 80 from younger classes, 80 from middle classes, and 80 from older classes. All subjects could only participate in the study after their parents/guardians agreed and signed an informed consent form. Subjects could withdraw from the study at any time without conditions if they felt discomfort. When the number of participating children decreased, additional participants were recruited to ensure the number remained constant.

The inclusion and exclusion criteria for the subjects were as follows:

#### a) Inclusion criteria for subjects:

- Pre - school children aged 3 - 6 years;
- Physically healthy, capable of participating in

moderate to high - intensity physical activities;

- Their parents/guardians are informed about the entire trial process and have signed an informed consent form.

#### b) Exclusion criteria for subjects:

- Those with cardiovascular or respiratory diseases, or other conditions unsuitable for physical activity;
- Those confirmed by their parents/guardians' medical questionnaire screening as unable to participate in moderate - intensity activities. The final number of participating children was 229.

#### 2.1.2 Parents

In Guangzhou, Foshan, and Zhaoqing, 229 parents of the children involved were selected as the subjects for the questionnaire survey, with 229 valid questionnaires ultimately retrieved.

### 2.2 Research Methods

#### 2.2.1 Questionnaire Survey Method

The questionnaire survey method is primarily aimed at parents.

#### (a) Source of the Questionnaire

The study referred to several questionnaires on factors affecting young children's physical activity developed by renowned scholars. Taking into account the real - life scenarios and cultural differences, the initial questionnaire was developed after several rounds of discussions with scholars in related fields. Based on existing scales, it was further refined into a parental questionnaire to investigate family factors affecting the physical activity levels of young children. Specific items and sources of the questionnaire are shown in Table 1, which outlines the selection of various dimensions of family factors that promote physical activity in young children.

**Table 1:** Statistical Table of Family Influence Factors on Promoting Physical Activity in Young Children

Dimensions	Questionnaire Items	References
Parental Awareness	Physical activities can promote the all - round development of young children	Wang Kaizhen et al., (2011) Cronbach's $\alpha$ =0.903, KMO=0.856,
	Your friends or colleagues are interested in sports activities	
Parental Psychological Support	You support your child's participation in various sports competitions	Cai Jie, (2021) Cronbach's $\alpha$ =0.868 KMO=0.786
	You encourage your child to engage in more outdoor activities	
	You actively inquire about whether your child participates in sports at kindergarten	
Parental Behavioral Support	I regularly participate in physical activities	Cai Jie, (2021) Cronbach's $\alpha$ =0.854 KMO=0.786
	I often participate in physical activities with my child	
	We have sports equipment or toys (such as balls, bicycles, etc.)	
	I limit my child's use of electronic devices	
Family Physical Activity Environment	I am concerned about safety issues during sports activities	Wang Kaizhen et al., (2011) Cronbach's $\alpha$ =0.903 KMO=0.856,
	I am concerned that sports activities will affect my child's learning	
	My family's economic condition or standard of living can support my child's participation in sports activities	
	The athletic quality of parents can enhance their child's level of physical activity	

#### (b) Validity of the Questionnaire

During the validation process, the researchers invited six experts in childhood physical education and two Chinese language experts. These experts assessed the content of the

questionnaire. They reviewed the dimensions of the family questionnaire and evaluated its applicability.

The experts scored each dimension of the questionnaire

developed by the researchers on a 10 - point scale (from 'disagree' to 'strongly agree'), following the standards set by Mohd Said (2020). It is generally considered acceptable if the content validity index for each item reaches or exceeds 0.78 [11]. The results showed that the average content validity index for the factors influencing family promotion of young children's physical activity was 0.79, indicating that the scale has high content validity. The two Chinese language experts evaluated the language expression of the scale for family influences on promoting young children's physical activity, with an overall average of 0.82, indicating that the scale has high linguistic validity.

As seen in Table 2, the KMO value for the scale of family promotion factors is 0.688, which is greater than 0.6. Furthermore, the Bartlett's test of sphericity for the scale yielded a p - value of 0.000, indicating high construct validity and suitability for factor analysis.

**Table 2:** Results of the KMO and Bartlett's Test of Sphericity for the Preliminary Survey of the Parent Questionnaire

KMO and Bartlett's Test of Sphericity			
KMO Measure of Sampling Adequacy		0.688	
Bartlett's Test of Sphericity	Approximate Chi - Square	203.336	
	df	45	
	Sig	0.000	

Further exploratory factor analysis was conducted, using

**Table 4:** Reliability Analysis of Preliminary Test Variables of the Parent Questionnaire

Factors Comprising Each Element	Item	Corrected Item - Total Correlation (CITC)	Alpha if Item Deleted	Cronbach's Alpha Coefficient
Parental Awareness	JZRZ1	0.648		0.786
	JZRZ2	0.648		
Parental Psychological Support	XLZC1	0.690	0.811	0.849
	XLZC2	0.662	0.803	
	XLZC3	0.788	0.704	
Parental Behavioral Support	XWZC1	0.468	0.785	0.773
	XWZC2	0.792	0.595	
	XWZC3	0.310	0.831	
	XWZC4	0.792	0.595	
Family Physical Activity Environment	HDHJ1	0.614	0.248	Initial Value 0.527 Final Value 0.889
	HDHJ2	0.387	0.439	
	HDHJ3	0.614	0.248	
	HDHJ4	0.034	0.889	

The Cronbach's alpha values for parental awareness, parental psychological support, parental behavioral support, and the family physical activity environment in the scale of family promotion factors are 0.786, 0.849, 0.773, and 0.527, respectively. The Cronbach's alpha value for the family physical activity environment is below 0.7, indicating certain issues with the scale. Considering the Corrected Item - Total Correlation (CITC), it was found that the value for HDHJ4 was 0.034, which is significantly below the minimum requirement of 0.3, suggesting a weak relationship with the other items. Removing HDHJ4 would notably increase the reliability coefficient. After deletion, the reliability coefficient value increased from 0.527 to 0.889, indicating

eigenvalues greater than 1 as the criterion and the principal component method for factor extraction, with varimax rotation to display the factor score coefficient matrix. The rotated factor loading matrix for the scale of family promotion factors is shown in Table 3. The results indicate that the factor loadings for all items are greater than 0.7, and there are no instances of high dual factor loadings, suggesting overall good exploratory factor analysis results. The scale demonstrates high construct validity.

**Table 3:** Rotated Component Matrix of Family Promotion Factors

Item	Factor			
	1	2	3	4
XWZC3	0.796			
XWZC2	0.78			
XWZC4	0.726			
XWZC1	0.723			
XLZC3		0.853		
XLZC2		0.733		
XLZC1		0.799		
HDHJ2			0.828	
HDHJ3			0.765	
HDHJ1			0.723	
JZRZ1				0.797
JZRZ2				0.771

(c)Reliability of the Questionnaire

that the data reliability quality is acceptable at this point.

**2.2.2 Measurement Method**

In this study, the ActiGraph GT3X+ accelerometer was used to measure the physical activity levels of young children. Participants wore the triaxial accelerometer continuously for 7 days, with valid recording times reaching 480 minutes per day. Data meeting this criterion were considered valid, and participants with valid data for all 7 days were included in the final statistical analysis [12].

Given the discrepancies in the units between the collected

questionnaire data and the physical activity level data of children, it was necessary to standardize the two types of data. This study utilized Z - score normalization in SPSS to make the data dimensionless, thus eliminating the impacts caused by the different natures of the data.

### 3. Research Results

#### 3.1 Analysis of the Correlation Between Family Factors and Physical Activity Levels in Young Children

To explore the impact of family factors on the physical activity levels of young children, this study first conducted descriptive statistical analysis and then analyzed the relationships between variables using Pearson's correlation coefficient (see Table 5). The data in Table 5 show that there is a significant positive correlation between physical activity levels and family factors. Firstly, there is a significant positive correlation between young children's physical activity levels and parental awareness ( $r = 0.361$ ,  $p < 0.01$ ), indicating that the higher the parental awareness of the

importance of physical activity for young children, the higher the physical activity levels of the children. Secondly, there is a significant positive correlation between children's physical activity levels and parental behavioral support ( $r = 0.414$ ,  $p < 0.01$ ), where parental support in behavior (such as providing opportunities and equipment for physical activities) positively correlates with the children's physical activity levels. Thirdly, there is a significant positive correlation between children's physical activity levels and parental psychological support ( $r = 0.409$ ,  $p < 0.01$ ), where emotional support from parents (such as encouragement and praise) significantly positively affects the children's physical activity levels. Lastly, there is a significant positive correlation between children's physical activity levels and the family physical activity environment ( $r = 0.499$ ,  $p < 0.01$ ), indicating that the physical activity environment provided by the family (such as adequate space and facilities at home) has the greatest correlation with the children's physical activity levels. The significant correlations among other variables also provide a foundation for further analysis.

**Table 5:** Correlation between Family Factors and Physical Activity Levels in Young Children

Variables	M	SD	1	2	3	4	5
1. Physical Activity Level	71.086	25.874	1				
2. Parental Awareness	5.684	0.946	0.361**	1			
3. Parental Behavioral Support	5.533	0.820	0.414**	0.242**	1		
4. Parental Psychological Support	5.974	1.142	0.409**	0.292**	0.267**	1	
5. Family Physical Activity Environment	5.442	1.183	0.499**	0.197*	0.320**	0.138	1

#### 3.2 Linear Regression Analysis of Family Factors and Physical Activity Levels in Young Children

To further explore the impact of family factors on the physical activity levels of young children, this study employed multiple linear regression analysis. The overall fit indices for the regression model were:  $R^2 = 0.429$ , adjusted  $R^2 = 0.408$ ,  $F = 20.444$ ,  $p < 0.001$ . The specific regression coefficients and statistical results are shown in Table 6.

The overall explanatory power of the model is 42.9%, with an adjusted explanatory power of 40.8%. This indicates that the selected family factors can explain 42.9% of the variance in young children's physical activity levels. The regression coefficient for the constant term is - 66.673 ( $p < 0.001$ ), suggesting that under the hypothetical condition of all family factors being zero, the physical activity level of young children would be significantly below average, further confirming the important impact of family factors on the physical activity levels of young children. First, the regression coefficient for parental awareness is 4.578 ( $p = 0.033$ ), with a standardized regression coefficient of 0.167. This means that for every unit increase in parental awareness of the importance of physical activity, the physical activity level of young children increases by 4.578 units, indicating

that parental awareness effectively promotes the physical activity levels of young children. Second, the regression coefficient for parental behavioral support is 5.881 ( $p = 0.021$ ), with a standardized regression coefficient of 0.186. This implies that for every unit increase in parental behavioral support, the physical activity level of young children increases by 5.881 units, showing that parental behavioral support has a significant positive impact on the physical activity levels of young children. Third, the regression coefficient for parental psychological support is 5.868 ( $p = 0.001$ ), with a standardized regression coefficient of 0.259. This suggests that each additional unit of psychological support increases the physical activity level of young children by 5.868 units, demonstrating that emotional support from parents, such as encouragement and praise, significantly positively affects the physical activity levels of young children. Lastly, the regression coefficient for the family physical activity environment is 8.113 ( $p < 0.001$ ), with a standardized regression coefficient of 0.371. This indicates that each additional unit of family physical activity environment increases the physical activity level of young children by 8.113 units, showing that the physical activity environment provided by the family has the largest and most significant positive impact on the physical activity levels of young children.

**Table 6:** Linear Regression Analysis of Family Factors and Physical Activity Levels in Young Children

Variables	Regression Coefficient ( $\beta$ )	Standard Error	Standardized Regression Coefficient (Beta)	T - value	P
Constant	- 66.673	16.449		- 4.053	0.000
Parental Awareness	4.578	2.119	0.167	2.16	0.033
Parental Behavioral Support	5.881	2.506	0.186	2.347	0.021

Parental Psychological Support	5.868	1.756	0.259	3.342	0.001
Family Physical Activity Environment	8.113	1.686	0.371	4.811	0.000

Note:  $R^2 = 0.429$ , Adjusted  $R^2 = 0.408$ ,  $F = 20.444$ ,  $P < 0.001$ .

#### 4. Discussion

Consistent with previous research findings, the present study also confirms the association between family factors and the promotion of physical activity in young children. The results indicate that the family is a key element in promoting physical activity in young children and the most significant environment affecting children's physical exercise [13]. The family factors that influence the physical activity levels of young children mainly include the family physical activity environment, parental behavioral support, parental psychological support, and parental awareness. Family support has a significant direct predictive effect on children's attitudes towards participation in physical activities, subjective norms, and perceived behavioral control. It also has a significant indirect predictive effect on children's intentions to engage in physical exercise and both a significant positive predictive and an indirect significant predictive effect on children's leisure - time MVPA [14].

##### 4.1 Analysis of the Family Physical Activity Environment in Promoting Physical Activity Levels in Young Children

The family physical activity environment refers to various apparatus and equipment that affect the sports exercise participation of children and adolescents. Research has found that the diversity and availability of sports equipment can significantly predict children's physical exercise behavior [15]. However, some studies also indicate that the family physical activity environment can have both positive and negative effects on the physical exercise of children and adolescents. Good sports facilities and equipment can promote the participation of children and adolescents in physical exercise, but an excess of electronic devices and online games can increase children's screen time, reducing their participation in physical exercise and outdoor activities, thus adversely affecting their physical health [16]. Therefore, a supportive physical environment at home may help enhance the physical activity levels of young children. Parents' shaping of the home physical environment is influenced by multiple factors, not only related to their internal cognition of physical activity but also potentially linked to external factors such as economic level, working hours, and community safety [17]. Thus, future research could consider the family physical sports environment as a "medium" to further explore the underlying internal and external factors affecting the physical activity behavior of young children.

##### 4.2 Analysis of Parental Behavioral Support in Promoting Young Children's Physical Activity

Parental behavioral support refers to the influence of parents' own physical exercise habits and behaviors as role models for children and adolescents engaging in sports [18].

Firstly, from the perspective of the family sports behavior

environment. Parental support behavior refers to providing relevant actions and modeling for their children. Parents are considered the first teachers and role models for their children; hence, parents' exercise habits and behaviors significantly impact children's participation in sports. Research by Kitzmann et al. indicates that families where parents enjoy exercising with their children and actively support their involvement in sports activities often see their children exhibiting more active physical behaviors compared to families unwilling to spend time interacting and providing encouragement [19].

Secondly, from the perspective of parenting styles. Overly strict and controlling parents might restrict children's freedom of movement and space by imposing too many rules, leading to a resistance towards exercise in children [20]. Conversely, a relaxed and autonomy - encouraging parenting style is more beneficial for the development of children's physical activities. Such parents usually grant more freedom and autonomy to their children, encouraging them to engage in various sports activities in a safe environment. This not only enhances children's participation in physical activities but also boosts their confidence and autonomy, fostering their interest in sports [21].

Furthermore, parental behavioral support also includes purchasing sports equipment, arranging exercise times, and creating opportunities for physical activities, providing necessary material and environmental support [22]. This active support significantly increases children's physical activity levels and also helps strengthen parent - child relationships, promoting children's psychological health and social adaptability [23]. Conversely, in families lacking support and encouragement, children may exhibit lower levels of physical activity and even develop negative attitudes towards sports [24].

Additionally, parents' own exercise habits have a particularly significant impact on children. Studies show that children of parents who themselves have good exercise habits are more likely to participate in sports activities [25]. This modeling effect is not only evident in daily life but also influences children's attitudes and interests in sports through the creation of a supportive family atmosphere.

##### 4.3 Analysis of Parental Psychological Support in Promoting Young Children's Physical Activity

Parental psychological support refers to the expectations, beliefs, and attitudes of parents that influence young children's participation in physical activity. Parents can impact their children's beliefs and behaviors regarding sports participation through activities such as explaining the value of certain activities to their children. In terms of sports participation, if parents believe their children are capable in sports, regardless of the actual performance, and always provide encouragement, considering sports participation as a

valuable activity for their children, the children are likely to view themselves as capable in sports and value their participation in physical exercise. This, in turn, increases the likelihood of children engaging in physical activity.

Numerous studies have validated the impact of parents as interpreters on their children's involvement in sports. Research by Kimieik and others using the family influence model explored how parents' interpretation of their sports experiences affects their children's level of sports participation. The findings revealed that the more children perceive their parents consider them capable in sports, the more the children believe in their own sports abilities [26]. Research by Julien and others further supports this view, finding that parents' expectations for their children's physical exercise influence their children's sports behavior. The more aligned parents' expectations are with their children's behavior, the more beneficial it is for their children's sports activities [27]. In such families, children believe they possess higher physical activity capabilities and are more likely to enjoy participating in sports activities. Research by Chinese scholars like Li Binbin has found that parents' attitudes towards sports are a significant factor influencing children's participation in sports exercises, and the level of parental support is directly related to the extent of their children's sports participation [28]. When parents believe their children have good sports abilities and value sports highly or encourage their children to engage in sports, the children are likely to believe in their capabilities and value sports highly, and are more likely to participate in sports.

Parental psychological support is not only reflected in the recognition of children's sports abilities but also in their attitudes and expectations towards sports activities themselves. For example, if parents actively participate in sports and show enthusiasm for sports, this attitude can be transmitted to their children, making them more willing to engage in sports. Moreover, by setting reasonable expectations, parents can motivate children to make progress in sports activities, thereby enhancing their confidence and interest in sports. Conversely, if parents have a negative attitude towards sports or do not value physical activities, this can also negatively affect children's enthusiasm for participating in sports.

#### 4.4 Analysis of Parental Sports Cognition in Promoting Young Children's Physical Activity

Sports cognition is based on an objective understanding of sports and integrates rational factors such as people's needs, desires, beliefs, and emotions. It is crucial for setting sports goals, determining sports value orientations, and attitudes [29]. In the family environment, parents' cognition and attitudes towards sports significantly influence their children's sports participation and physical activity levels.

Firstly, parents' emphasis on and positive attitudes towards sports can directly affect young children's sports motivation and attitudes. If parents believe that sports activities are very important for their child's growth and actively participate in and support their child's sports activities, the child will also

be influenced by this positive attitude, displaying higher participation motivation and a positive attitude [25].

Secondly, parents' recognition of the value of physical activity can affect young children's participation in physical activities. In Zhang Fengling's research on the relationship between family and youth physical activity, parents' sports values were introduced as a psychological environment in family sports. It was analyzed that parental support is based on their recognition of the value of sports. The deeper parents understand the value of sports, the greater their support for their children's physical activities [30].

Thirdly, parental cognition also indirectly influences children's sports participation by shaping the family's sports atmosphere. In families with a strong sports atmosphere, children are more likely to be influenced by the family environment and actively participate in various sports activities [31]. This sports atmosphere includes not only interaction and encouragement among family members but also the family's investment in time and resources. These practical supports can provide children with more opportunities to participate in sports and enhance their interest and confidence in sports activities.

## 5. Conclusion

This study demonstrates that parental cognition, behavioral support, psychological support, and the family physical activity environment have significant positive impacts on the physical activity levels of young children. The higher the parental cognition regarding physical activity, and the more behavioral and psychological support provided, the higher the physical activity levels of young children. Additionally, a conducive physical activity environment provided by the family is a key factor in promoting physical activity among young children.

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### Author Profile



**Wang Menghua Wang** received her Bachelor's degree in 2009 and her Master's degree in 2015. She is currently employed at Zhaoqing University in Guangdong Province, China, and her research focuses on the theory and practice of early childhood physical education.