Influencing Factors of Children Physical Activity in Family

Jie Cai

Shandong University of Finance and Economics

Yaping Zhao (✉ zhaoyapingyp@163.com)

Shandong Sport University

Jing Wang

Shandong University

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Abstract

Children physical activity is an important guarantee for children's physical and mental health. Understanding the relevant influencing factors of children physical activity in family is related to the healthy growth of children and the happy life of families. Based on social exchange theory and the structural equation model, this study investigated the influencing factors of children physical activity in family. The results showed that government had a significant negative impact on parents' perceived risks. Community has a significant positive effect on parents' perceived benefits and a significant negative effect on parents' perceived risks. Kindergarten has a significant positive effect on parents' perceived benefits, but has no significant effect on the parents' perceived risks. Children sports club has a significant positive effect on parents' perceived benefits. Parents' perceived benefits has a significant positive impact on children physical activity in family, while perceived risks has a significant negative impact. Based on this, the government should play a leading role in the development of children physical activity in family. Community provides supplementary support. Kindergarten is the key point of developing children physical activity in family. Children sports club is the auxiliary force of children physical activity in family.

1 Introduction

Children Physical activity is a great cause of the present and future generations. Childhood stage is the key period for the development of human character and emotion, and children Physical activity is an important guarantee for children's body health and mind health. Children Physical activity in family refers to the process of cultivating and developing the basic physical activity ability of children aged 3-6 within the family scope. The health problem of children's obesity has become a hot issue in today's society. The significance of children physical activity has been excavated and re-examined by people. However, due to the long-term lack of awareness of the importance of children physical activity in the past, many parents still believe that children physical activity is full of various uncertainties, ignoring the positive effects of children physical activities.

This article based social exchange theory, social exchange theory is also known as exchange theory, first proposed by sociologists Homans^[1], points out that people in social activities always want to obtain the biggest benefit with minimal cost, they tend to engage in activities that bring them obvious benefits and rewards. This rational process of balancing gains and losses is called social exchange behavior. Blau^[2] proposes that people will estimate their possible benefits in advance in social activities and make comprehensive comparison to select the activities that maximize their benefits. In the process of weighing advantages and disadvantages, people are trying their best to pursue maximum benefits and minimum risks, that is, there are perceived benefits and perceived risks in the process of social exchange behaviour. Physical activity is a conscious and purposeful social activity. Children physical activity in family can also be regarded as a kind of social activity. The process of children physical activity is an interactive process of individual, material and social environment. Relevant study shows that children physical activity is usually controlled by external factors, and the greatest influence factors are usually parents and other guardians^[3].

Children physical activity in family can not only improve children's physical health level and social development, but also drive family members to participate in physical activity, which can be regarded as perceived benefits; in exchange, children and their families have to pay costs such as time, energy and money, which can be considered as perceived risks. Therefore, according to social exchange theory, children physical activity in families can be

regarded as an exchange behavior. This study will take the social exchange theory as the starting point to explore the perceived risks and perceived benefits faced by parents in the decision-making process of whether to support children participating in physical activity and their mechanism of action, in the hope of expanding the relevant theories of children physical activity in family and providing guidance for the development of children physical activity in family.

2 Materials And Methods

2.1 Hypotheses

2.1.1 Government and parents' perceive risks

Government formulates policies and regulations have a huge impact on public awareness and behavior from various perspectives on a macroscopic level, World Health Organization (WHO) regards environmental and policy intervention as the first measure to prevent obesity, government's influence on physical activity is not only in establishing sports related laws and regulations but also reflected in the other auxiliary policies, etc. Policy and regulation are considered to be the most important factors influencing individual physical activity[[i]]. Research shows that the existence of policies does not make people perceive the benefits, but once the absence of policies, people will perceive the existence of risks[[ii]]. The formulated policies are only programmatic provisions, which need to be implemented with the cooperation of the functional departments, otherwise the rights and interests of the public will be damaged, that is, the lack of government functions or ineffective implementation will lead to the loss of rights and interests.

H1: Government will have a negative impact on parents' perceived risk.

2.1.2 Community and parents' perceive risk/benefit

The gradual improvement of community sports facilities has provided good fitness conditions and environment for the public. Community, as an external environment with close relationship between children and their families, can have an important impact on the development of children physical activity, and can also alleviate the difficulties of family physical education. Physical education support from community is easier to be accepted by families, and can bring positive influence on family education and children's development with better effect[[iii]]. However, children's outdoor physical activity space is generally less in China at present, children's outdoor physical activity facilities are insufficient, the design of community physical activity environment is unreasonable[[iv]]. All this increases the parents' perception of risk. Parent-child physical activity is important for children's social and emotional development as well as their future health and well-being, but many parents feel that community-based parent-child physical activities are infrequent and informal[[v]].

H2a:Community will have a positive impact on parents' perceived benefits.

H2b:Community will have a negative impact on parents' perceived risks.

2.1.3 Kindergarten and parents' perceive risk/benefit

Button[[vi]] found that school sports facilities and equipment will have a positive impact on children physical activity, which is embodied in the sports facilities and equipments' quantity and ease of use. Schools with larger

playgrounds and gyms per capita also had higher levels of physical activity among children[[vii]]. Moreover, Haug et al. [[viii]] found that the amount of students physical activity with more outdoor activity areas is significantly greater than that of students with less activity areas. Teachers have an important influence on students' participation in physical activity[[ix]]. While after the investigation on children physical activity in kindergarten in Beijing, it is pointed out that the level of sports equipment in kindergarten has a direct impact on the overall quality of children physical activity. On one hand, the physical quality and professional level of preschool teachers will affect the use of equipment function to be able to play, on the other hand, many kindergartens are under the pressure of safety responsibility from parents, as a result, kindergartens are limited in carrying out children physical activity[[x]].

H3a: Kindergarten will have a positive impact on parents' perceived benefits.

H3b: Kindergarten will have a negative impact on parents' perceived risks.

2.1.4 Children sports club and parents' perceived benefits

Children sports club mainly provide parent-child sports courses for parents and children or independent sports courses for children, and are committed to improving children's physical skills and comprehensive ability. Children sports clubs are at the meeting point between families and children, which can not only enable children to get physical development, but also benefit children's all-round growth and development[[xi]]. through some Internet platforms to obtain accurate family traffic, use its own resources and characteristics, continue to dig deeply and provide more additional physical activity services to families, improve the satisfaction of parents and childrens[[xii]].

H4 Children sports club will have a positive impact on parents' perceived benefits.

2.1.5 Parents' perceived risks and children physical activity in family

Considering safety factors, many parents believe that their children's daily physical activities are enough and there is no need to add extra physical activities. However, parents' misjudgment will have a negative impact on the healthy growth of children over time[[xiii]]. Some parents even believe that children sweat after physical activity easily lead to colds. Some believe that if children spend too much time in physical activity will lead to no mind to learn or be restless when go to elementary school. Some parents think that children lack safety awareness, physical activity is prone to risk[[xiv]]. Many parents give children a lot of learning courses, such as English, art, thinking training, etc., focus on the development of intelligence, but ignore the children physical activity, and even a small number of parents have a psychological resistance to children physical activity[[xv]].

H5: Parents' perceived risks will have a negative impact on children physical activity in family.

2.1.6 Parents' perceived benefits and children physical activity in family

Troste[[xvi]] found that the more times children participate in children physical activity, the faster their physical quality and skills will improve, and the improvement of physical quality and skills will enhance their self-efficacy. The reason why many parents support their children to participate in physical activity is that they think it can improve their children's health and help them develop excellent qualities such as self-confidence and courage[[xvii]]. Many parents encourage their children to participate in physical activity in order to improve their

physical quality and self-confidence, build a foundation for participating in a variety of social activities, and improve interpersonal skills[[xviii]].

H6: Parents' perceived benefits will have a positive impact on children physical activity in family.

2.2 Study Design

A cross-sectional online survey of parents of Chinese children were conducted. The study was conducted in accordance with the Declaration of Helsinki as established by the World Medical Association. Completion and submission of the online survey implied consent to participate in this study, which was declared to respondents at the commencement of the survey. The study protocol was approved by ethics committee of Shandong University of Finance and economics.

2.3 Participants

Parents of children in kindergartens (i.e., children are aged from 3 years to 6 years) living in the mainland of China were recruited for this survey study.

2.4 Procedure

Data collection took place between 1 February and 15 April 2021. Participants were invited to complete an online questionnaire that was administered via a free online Chinese survey platform (<https://www.wjx.cn>). Participants who completed the online questionnaire would get 5 yuan as a reward. At last, 323 were recovered with a recovery rate of 96.3%. Among them, 286 were valid, with an effective rate of 88.5%. The ratio of sample amount to item was 13.6:1. The total amount of sample in this study has reached the optimal requirement of structural equation modeling[[xix]].

2.5 Questionnaire Design and Data Collection

Likert seven-grade scale was used for the questionnaire. In order to ensure the content validity of the scale, the scale design was derived from existing literature. On this basis, after several research group discussions and expert opinions, the preliminary design was formed. Then, the parents and kindergarten teachers were interviewed, according to their feedback, the questionnaire was adjusted and the final questionnaire was determined. In addition to the basic information of the participants, the questionnaire involved 7 latent variables, including government, community, kindergarten, children sports club, perceived risks, perceived benefits, and children physical activity in family, with a total of 21 items (shown in table 2).

3 Results

3.1 Participant Characteristics

A total of 286 participants completed the survey (shown in Table 1). Participants were aged between 22 and 40 years ($M = 30.5$). Among these participants, most were female (62.6%), and Higher than bachelor's degree (44.8)

had Income sufficient for expenditurea(49.0%).

Table 1. Demographic characteristics of participants (n = 286).

Category	Mean	<i>n</i>	%
Age (years)	30.5		
Gender			
Female		179	62.6
Male		107	37.4
Education level			
Less than high school		48	16.8
TAFE/College		110	38.5
Higher than bachelor's degree		128	44.8
Family income			
Income insufficient for expenditure		51	17.8
Balance between income and expenditure		95	33.2
Income sufficient for expenditure		140	49.0

3.2 Reliability and Validity Test

Firstly, Cronbach's α coefficient for the scale was calculated using SPSS 22.0 software. As shown in Table 2, Cronbach's α coefficient of all latent variables exceeded 0.7, which met the requirements for internal consistency of the scale, reflecting a good reliability level. Using Mplus 7.0 software for further reliability and validity analyses, squared multiple correlations (SMC) values of all items in the questionnaire were greater than 0.36, indicating high reliability of the items (Table 2.). The composite reliability (CR) values all exceeded 0.7, which indicates that the reliability of the topic composition was high. Average variance extracted (AVE) values were all greater than 0.5, which demonstrates that the scale has good convergent validity. Table 3 shows the discriminant validity test results of each latent variable. The square root of the AVE value of most latent variables was greater than the absolute value of the correlation coefficient between these variables and other latent variables, reflecting higher discriminant validity among the variables incorporated for analyses[[i]].

Table 2. Variables and Measurement Indicators

Latent variable	Item	Item source	Estimate	SMC	CR	AVE	Cronbach's α
Governmentgov	Children physical activity needs government support	Zhuang Bi et al. [[ii]] 2019	0.918	0.843	0.930	0.816	0.930
	Implement policies on children physical activity in place		0.835	0.697			
	The content of children physical activity is standardized		0.953	0.908			
Community (com)	There are sports facilities for children in the community	Welk et al. [[iii]] (2013)	0.851	0.724	0.884	0.718	0.901
	The community regularly carries out children physical activity		0.873	0.762			
	The community has enough places for children to play		0.818	0.669			
Kindergarten(gar)	Kindergarten organize many physical activities	Button B et al. [[iv]] (2013)	0.880	0.774	0.892	0.734	0.811
	The sports facilities can meet children's needs		0.882	0.778			
	Physical education curriculum is reasonable		0.806	0.650			
Children sports club(clu)	Advanced physical educational concept	Wang Sijia [[v]] (2019)	0.761	0.579	0.838	0.633	0.757
	Lote of sports		0.836	0.699			

	fields and equipments							
	Professional physical education teacher		0.788	0.621				
perceived risks (ris)	Safety risks	Su Jianzhen et al. ^[18] 2012	0.655	0.429	0.781	0.547	0.790	
	Unprofessional children sports equipment may not safe		0.843	0.711				
	Children can catch a cold after sweating		0.707	0.500				
perceived benefits (ben)	May sweat and catch a cold after exercise	Lee et al. ^[20] 2015	0.691	0.477	0.877	0.708	0.746	
	Improve children's balance and coordination		0.887	0.787				
	Children's movements become more alert		0.927	0.859				
children physical activity in family (fam)	Family memnbers often play sports together	Thorn ^{[[vi]]} 2008	0.849	0.721	0.861	0.674	0.840	
	Children love physical activity		0.835	0.697				
	Encourage and accompany children in physical activity		0.777	0.604				

Table 3. Test Form for Discriminant Validity of Variables

	AVE	GOV	GAR	COM	CLU	RIS	BEN	FAM
GOV	0.816	0.903						
GAR	0.734	0.058	0.857					
COM	0.718	0.030	0.515	0.847				
CLU	0.633	0.036	0.264	0.239	0.796			
RIS	0.547	-0.142	-0.149	-0.127	-0.040	0.740		
BEN	0.708	0.018	0.539	0.581	0.434	-0.099	0.841	
FAM	0.674	0.017	0.175	0.186	0.134	-0.113	0.310	0.823

Note: Bold values represent the square root of AVE (Average Variance Extracted) values

3.3 Hypothesis testing

After several revisions, the final analysis model results are shown in Table 4. The fit indices suggest that the model fits the data well. Seven hypotheses were supported and one hypotheses were not. The empirical results and hypotheses are shown in Table 4.

Table 4. Parameter Estimation and Hypothesis Testing of Analytical Models

Path	Estimated value	P-Value	Hypothesis
perceived risks←Government	0.066	*	H1 supported
perceived benefits←Community	0.059	***	H2a supported
perceived risks←Community	0.083	*	H2b supported
perceived	0.061	***	H3a supported
perceived risks←Kingdergarten	0.083	0.227	H3b not supported
perceived benefits←children	0.054	***	H4 supported
Children physical activity in family←perceived risks	0.060	**	H5 supported
Children physical activity in family←perceived benefits	0.049	***	H6 supported
Fit Index	$\chi^2/df = 350.753/237 = 1.480$; RMSEA=0.050 , SRMR=0.074; CFI=0.972, TLI=0.967		

Notes: * P<0.05, ** P<0.01, *** P<0.001

The fit indexes of structural equation model in Table 4 are: $\chi^2/DF = 350.753/237 = 1.480$, which meets the requirement of less than 3. RMSEA=0.050, SRMR=0.074, meeting the requirements of less than 0.08; CFI=0.972 and TLI=0.967 meet the requirement of greater than 0.9. Therefore, all data fit indexes in this paper meet the test standard, indicating that the model matrix is close to the sample matrix and the model is acceptable.

As is shown in Table 4, the path coefficient of government to perceived risks is -0.143 and significant at the level of 0.05, indicating that government has a significant negative effect on perceived risks, H1 is supported. The path coefficient of community to perceived benefits is 0.379 and significant at the level of 0.001, indicating that community has a significant positive effect on perceived benefits, H2a is supported. The path coefficient of kindergarten to perceived benefits is 0.280 and significant at the level of 0.001, indicating that kindergarten has a significant positive effect on perceived benefits, H3a is supported, the path coefficient of kindergarten to perceived risks is not valid, and H3b is not supported. The path coefficient of children sports club to perceived benefits is 0.266 and significant at the level of 0.001, indicating that children sports club has a significant positive effect on perceived benefits, H4 is supported. The path coefficient of perceived risks to children physical activity in family is -0.205 and significant at the level of 0.01, indicating that perceived risks has a significant negative effect on children physical activity in family, H5 is supported. The path coefficient of perceived benefits to children physical activity in family is 0.564 and significant at the level of 0.001, indicating that perceived benefits has a significant positive effect on children physical activity in family, H6 is supported.

4 Discussion

The development of children physical activity in family needs society support. Each should not only play its own responsibility, but also cooperate to build a social support system for children physical activity in family. According to the above analysis, it is believed that the government plays a guiding role in the development of children physical activity in family through formulating policies, implementing policies and improving policies. Community provides supplementary support for the development of children physical activity in family. Kindergarten is not only the focus of developing children physical activity in family, but also play an important role in promoting children physical education to parents. The existence of children sports club plays an auxiliary role in the development of children physical activity in family. Government, community, kindergarten, family, children sports club, perceived benefits and risk will be discussed and analyzed as followings.

First, government has a significant negative effect on perceived risks, indicating that the more and the better government does, the less the parents' perceived risks. Parents hope to get more support from the government, such as clear guidance on children physical activity from laws, regulations, policies and systems, which can effectively reduce parents' perceived risks, improve the motivation for children to participate in children physical activity, and enhance parents' confidence and security.

Second, community has a significant positive effect on parents' perceived benefits, and a significant negative effect on parents' perceived risks. It shows that the greater the efforts of the community in children physical activity, the greater the perceived benefits of parents, and the smaller the corresponding perceived risks. Parents hope that children can get the opportunity of physical activity within the community. For example, parents can not only take their children to play games independently in the community, but also hope to have the opportunity to

participate in parent-child activities or parent-child sports meetings organized by the community, but the premise is to ensure the safety of children. This requires community children sport facilities and equipments, community children sport services, community children sports security and so on.

Third, kindergarten has a significant positive effect on parents' perceived benefits, but no significant effect on parents' perceived risks. It shows that the better the kindergarten physical education work is carried out, the greater the parents' perceived benefits will be. At present, parents have no obvious risk perception for kindergarten physical education. Many parents think that kindergarten for children's bounden responsibility, thus physical activity involved in kindergarten teachers, venues equipment, and course put forward higher request, it is gratifying that most parents generally affirm the safety of kindergarten physical education and do not worry about the risk of the development of children physical education.

Fourth, children sports club has a significant positive effect on parents' perceived benefits, indicating that parents hope to take their children to participate in physical activities in children sports club. children sports club not only provide parents with opportunities for parent-child physical activities, but also allow children to do physical activities in the company of children of the same age. In this case, children physical activity will be better carried out in family, children and parents will get more benefits.

Fifth, parents' perceived risks has a significant negative effect on children physical activity in family, and parents' perceived benefits has a significant positive effect on children physical activity in family, indicating that children's physical activity can improve their physical fitness, improve their balance, coordination, sensitivity and other benefits, and have a positive effect on whether parents support children to carry out physical activities. But if the relevant safety measures or other factors are not considered, it will also have a negative effect on parents' support for children physical activity. At the present stage, there is still a long way to go to carry out children physical activity in family. Many parents have a deep perception of the benefits of children physical activity in family that can bring physical and mental health development, but at the same time, there are still concerns about whether sports are safe or even delay children's learning of other subjects.

5 Conclusion

This study suggests that government is significantly related to parents' perceived risk, community and kindergarten are significantly related to parents' perceived benefits and risks, children sports club is significantly related to parents' perceived benefits. Parents' perceived benefits and risks are significantly related to children physical activity in family. There is a need to translate the findings of this research in future children physical activity in family intervention studies in order to improve children physical activity in family.

Declarations

1. Ethics approval and consent to participate:

The study protocol was approved by ethics committee of Shandong University of Finance and economics. Study participation was voluntary and informed consent obtained from all participants.

2. Consent for publication:

Not applicable

3. Availability of data and materials:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

4. Competing interests:

The authors have no competing interests to disclose.

5. Funding:

Not applicable

6. Authors' contributions:

J.C. participated in the study design and participants' recruitment, prepared the draft manuscript and subsequent manuscript revision prior to publish.

Y.Z. joined the study design and contributed to the manuscript revision.

J.W. did data analysis and text proofreading.

All authors have read and agreed to the published version of the manuscript.

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8. Authors' information (optional)

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