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ARTICLE

The Relationship between Rural Left-Behind Children's Physical Activity and Hope: The Mediating Effects of Perceived Social Support

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ABSTRACT

It has been confirmed in previous studies that there is a positive correlation between physical activity and hope. In this study, rural left-behind children in China was taken as the participants to investigate the impact of physical activity on hope in rural left-behind children and examine the mediating role of perceived social support in the relationship between physical activity and hope. 797 valid copies of the questionnaire were collected from China. Pearson correlation coefficient was employed to analyze the relationship between physical activity and hope; SEM and Bootstrap were used to test the mediating effect of perceived social support. The results show that physical activity can not only directly and positively predict the level of hope in rural left-behind children but can also predict the level of hope through perceived social support; perceived social support plays a mediating role in the relationship between physical activity and hope. These results highlight the necessity to pay more attention to the physical activity of left-behind children and the possibility to improve the level of hope by increasing their physical activity; at the same time, the acquisition of more material, emotional and psychological support from teachers and guardians is more conducive to improving the sense of hope in left-behind children. These findings can deepen the understanding of the sense of hope in left-behind children, and provide new methods for and enlightenments on improving the level of hope in left-behind children.

KEYWORDS

Left-behind children; physical activity; hope; perceived social support; mediating role

Introduction

Left-behind children refer to those minors who stay at home with both or one of their parents working in other places for a long time. With the development of society, the continually growing number of Asian migrant workers, the majority of whom are in the prime of their reproductive lives and leave families including children behind in their home countries, raises important questions about how families are sustained across transnational spaces [1]. The high-degree reliance of China's economic development on cities and the lack of employment opportunities in rural areas inevitably urge rural parents to seek jobs in economically developed cities. In this sense, rural left-behind children can be considered as the product of China's economic development. The existence of left-behind children has become a social issue and attracted extensive academic attention. Specifically, rural left-behind children are children under 16 who live in rural areas with both or one of their parents working in cities [2]. They usually live with one of their parents, or with their grandfather and/or grandmother, or even with other relatives and friends of their parents. According to a survey, there were 60 million rural left-behind children in China in 2016 [3]. Particularly, 57.2% of these children were left behind by one of their parents, and 42.8% of them were left behind by both parents who were working in other places, generally facing the difficulty to get love and care from their parents [3]. As revealed in the survey, 70% of these parents went home less than three times a year, and some even went home only

once a few years. Due to the long-term absence of their parents, left-behind children fail to meet their emotional needs or to have mental nursing when encountering psychological problems, which greatly undermines their physical and mental health. In this context, left-behind children are prone to abepithymia, inferiority, cowardice, antisocial behavior and other psychological problems, and are likely to be irritable, impulsive and irritable [4]. Left-behind children in Vietnam, Thailand, India, the Philippines and other countries were also found to have a series of mental health problems [5–7]. For example, the mental health level of left-behind children was significantly lower than that of non-left-behind children, and the scores of left-behind children in three dimensions including learning anxiety, social anxiety and self-blame tendency were significantly higher than those of non-left-behind children [8]. Therefore, it is of great social significance and research value to improve the mental health of left-behind children.

Hope

While paying attention to negative psychology in left-behind children, researchers have also begun to focus on the development of positive psychology in left-behind children in recent years. At present, the cultivation of positive psychological qualities has been proposed as a measure to resist negative psychology in left-behind children. Notably, hope is a highly important positive psychological quality. It refers to an internal cognitive evaluation mechanism established based on an internal sense of success under a positive motivation state in order to achieve desired goals; it evaluates internal and external conditions and seeks all feasible methods, especially "agency", in the pursuit of goals [9]. Specifically, it includes two aspects: pathways (path and plan to achieve goals) and willpower (a kind of goal-consumed energy). The quality of hope, on the one hand, helps individuals resist the impact of negative psychology [10,11] and, on the other hand, plays a role in enhancing other positive psychological qualities in individuals [12]. Those individuals with high-level hope are strict with themselves, establish long-term goals and values in life, have firm beliefs, take actions for their goals, and tend to find more effective methods in the process of pursuing their goals [13]. Hope is also importantly related to children's resilience in response to challenges and stressors [14]. Therefore, when it comes to the special group of rural left-behind children, it is especially significant and beneficial to cultivate their quality of hope and improve their mental health level through exploring and manipulating the influencing factors and mediating mechanism of their sense of hope.

Physical activity and hope

Among the various factors that affect mental health, physical activity has received more and more attention in virtue of its positive effects. It was found in a research on middle school students that the amount of exercise in physical activity can positively predict their level of hope, and that individuals can obtain positive emotional experience during the engagement in physical activity, which is conducive to enhancing their positive psychological qualities and boosting up their level of hope [2]. Those with high-level hope are more able to devote themselves to physical activity than those with low-level hope [15]. At the same time, with the rise of positive psychology, researchers are widely concerned with how to improve individuals' mental health by giving full play to their positive psychological resources (e.g., social support). However, the mechanism through which physical activity affects the level of hope in rural left-behind children is still unknown at present. Therefore, this study was conducted to examine the role of perceived social support in the relationship between physical activity and hope in rural left-behind children.

Physical activity and perceived social support

Perceived social support is the degree to which individuals feel understood, supported and respected in social life [16,17]. Wu et al. [18] investigated college students and found that perceived social support is closely related to individuals' physical activity behavior. Physical activity allows rural left-behind children to broaden their interpersonal interaction channels and increases the possibility for them to get peer support or other support [2]. The research of Dyck et al. [19] also showed that physical activity is positively related to perceived social support, indicating that individuals can obtain more social support to a certain extent through actively participating in physical activities.

Perceived social support and hope

According to the theoretical model of social support, social support has a direct expansionary effect on the physical and mental health of individuals. One's psychology and behavior are affected by multiple external factors. For instance, in-family care and love from parents, in-school support from classmates and encouragement from teachers all have a positive effect on individuals' physical and mental health [20]. Hence, those left-behind children that receive more social support have access to more objective resources when encountering problems. Consequently, they can face life with a positive attitude, and have a higher level of hope. Sica et al. [21] observed that social support from both parents and peers can significantly predict hope in adolescents in the future. Bareket-Bojmel et al. [22] found a positive correlation between perceived social support and hope. It was also confirmed in a one-year follow-up study that there is a significant positive correlation between perceived social support and hope [23].

As suggested in previous studies, physical activity and hope have a positive correlation. However, there is neither a clear conclusion nor sufficient discussion on the mechanism through which physical activity affects hope in rural left-behind children. For this reason, rural left-behind children were taken as the participants of this study to analyze the predictive effect of physical activity on hope, and the mediating effect of social support on the relationship between physical activity and hope, so as to provide reference for improving their mental health level.

Methodology

Objective

It is necessary to first estimate the size of the sample before starting a survey. Kline [24] suggested that the sample size should be 15–20 times or more than 20 times the number of items in the questionnaire. Considering that there are 27 questions in the four questionnaires adopted in this study, it was believed that the sample size should be more than 540.

This study was conducted in Hunan Province. A multistage stratified cluster sampling method was used to select participants. Volunteers were recruited among students from Grade 3 to Grade 9 in 8 rural schools in Hunan Province, China. The questionnaire was distributed to the group of volunteers. After collecting all the copies of the questionnaire, the research team immediately checked all the completed copies and removed invalid ones. The criteria for judging invalid copies are: (1) those copies filled in regularly, including those with the same option selected throughout the questionnaire, those with all the options selected regularly throughout the questionnaire, and those with untrue and unreliable answers; (2) those copies with more than 5 missing questions; (3) those copies completed overtime. The participants of this study were selected according to the basic information filled in by the volunteers. The inclusion criteria are: (1) those under the age of 16; (2) those who have both or one of their parents leaving their hometown and family and working in other places. Eventually, 797 left-behind children were included, including 401 male students and 396 female students. There are 142, 128, 130, 122, 96, 105 and 74 students respectively from Grade 3 to 9, with the age ranging from 9 to 15 years old (11.67 ± 1.94 years old).

Data collection

Before the investigation, all the school administrators, teachers and students who participated in this study were informed of the research purpose, main operation methods and precautions of this study. After obtaining consent from relevant school administrators and teachers, the research team then recruited volunteers by grade from the student group. Before the volunteers filled in the questionnaire, the teacher explained the precautions for filling in the questionnaire. Then, the volunteers filled in the questionnaire in the classroom. All the copies of the questionnaire were filled in anonymously and should be completed within a specified period of time. All the completed copies were collected by the teacher on the spot. This study meets the standards and requirements of the ethics committee.

Measuring instruments

Basic Demographic Information Questionnaire: This questionnaire was used to collect basic information according to the corresponding research needs, including the gender, age, grade, left-behind situation and commuting way of the participants.

Physical Activity Rating Scale (PARS-3) [25]: PARS-3, compiled by Liang, was used to investigate left-behind children's physical activity. The scale consists of three questions, mainly to evaluate the participation of left-behind children in physical activity in the past month. These three questions test intensity, time and frequency respectively. Each question is provided with five options for selection. Intensity and frequency are scored from 1 to 5 points corresponding to Option 1 to 5, while time is scored from 0 to 4 points corresponding to Option 1 to 5. The amount of exercise is the result of multiplying intensity, time and frequency. This scale has a minimum score of 0 and a maximum score of 100. The test-retest reliability of this scale is 0.82.

Perceived Social Support Scale (PSSS) [26]: Perceived Social Support Scale was compiled by Zimet et al. [26]. It contains 12 questions, each of which is scored from 1 to 7 points. Therefore, the total score in the scale is 12 and 84 points. Perceived Social Support Scale has three subscales, namely peer, family and other support. There are four questions for each subscale. Yan et al. [27] revised this scale by changing "colleagues, relatives and leaders" to "classmates, relatives and teachers". The three subscales measured are perceived support from friends, family and others. The sum of the scores in these three subscales is the total score in Perceived Social Support Scale. If the total score is high, it suggests that the individual perceives a high level of total social support. The Cronbach's α of the scale is 0.865 in this study.

Children's Hope Scale (CHS) [28]: CHS, compiled by Snyder et al. [28], consists of 6 items and two subscales respectively to measure agency (3 items: 1, 3, 5) and pathways (3 items: 2, 4, 6). Likert 6-grade scoring is adopted in this scale. The options are scored 1 point, 2 points, 3 points, 4 points, 5 points and 6 points, respectively corresponding to "strongly disagree", "disagree", "slightly disagree", "slightly agree", "agree" and "strongly agree". A larger score implies a higher level of hope. The internal consistency reliability of CHS was between 0.72 and 0.86 when it was used to test 6 child samples, with its test-retest reliability being 0.71 at an interval of 4 weeks. Zhao et al. [29] translated this scale into a Chinese version, which was verified to have high reliability and validity, and can be used as an instrument to measure the trait of hope in Chinese children. The Cronbach's α of the scale is 0.747 in this study.

Statistical methods

The data was analyzed by SPSS 21.0 and AMOS21.0 statistical software. The qualitative data was expressed as the number of cases and percentage, and the quantitative data was expressed as mean ± standard deviation. The correlation between variables was analyzed through Pearson correlation analysis; the mediating effect was analyzed using the structural equation model; the significance of the mediating effect was tested by the Bootstrap method. Maximum likelihood method was used to estimate the parameters of the model. Sampling was performed 2000 times by following Bootstrap self-sampling method to calculate the effect value and 95% confidence interval for the significance of the mediating effect. The difference with $p < 0.05$ was considered to be statistically significant.

TABLE 1

Basic information of the participants

		n	Percent (%)
Gender	Male	401	50.31
	Female	396	49.69
Age	9	138	17.31
	10	132	16.56
	11	127	15.93
	12	125	16.68
	13	97	12.17
	14	97	12.17
	15	81	10.16
Grade	3	142	17.82
	4	128	16.06
	5	130	16.31
	6	122	15.31
	7	96	12.05
	8	105	13.17
	9	74	9.28
Mode of commuting to school	No lodging at school	558	70.01
	Lodging at school	239	29.99

TABLE 2

Descriptive statistical results and analysis of correlation between variables

	Mean	Standard deviation	1	2	3
1. Physical activity	1.33	0.62	–		
2. Social support	54.18	14.48	0.382**	–	
3. Hope	23.80	5.77	0.316**	0.494**	–

Results

Basic information

Among the 797 left-behind children, there are 401 male students and 396 female students; there are respectively 142, 128, 130, 122, 96, 105, and 74 students from Grade 3 to Grade 9; they are aged between 9 and 15, with an average age of 11.67 ± 1.94. See Table 1.

Descriptive statistics and correlation analysis of variables

The correlation analysis method was used to analyze the correlation between variables. The correlation matrix of each variable is shown in Table 2. As shown in Table 2, there are significant positive correlations among physical activity, social support and hope. These results provide a good basis for the subsequent mediating effect test.

Mediating effect test

The results of mediating effect analysis show that the Bootstrap 95% confidence interval of the total effect (0.281–0.433) produced by physical activity and hope does not contain the value of 0. This indicates that the total effect of physical activity on hope is significant (the standardized effect value is 0.354). The absence of the value of 0 in the Bootstrap 95% confidence interval (0.052–0.215) of the direct effect of physical activity on hope indicates that physical activity has a significant direct effect on hope (with the standardized effect value being 0.127, accounting for 35.88% of the total effect); the absence of the value of 0 in the Bootstrap 95% confidence interval (0.175–0.289) of the mediating effect of social support between physical activity and hope indicates that the mediating effect is significant (with the standardized effect value being 0.227, accounting for 64.12% of the total effect). Therefore, social support plays a partial mediating role between physical activity and hope. The effect values of the paths above are shown in Table 3, and the mediation model is shown in Fig. 1.

As for model fitting indexes, X^2/DF = 2.862 was lower than the acceptable minimum value of 3, indicating that the analysis result was acceptable. RMSEA (Root Mean Square Error of Approximation) = 0.066, lower than the acceptable minimum value of 0.080. NFI (Normed Fit Index) = 0.982, CFI (Comparative Fit Index) = 0.986, IFI (Incremental Fit Index) = 0.986, GFI (Goodness-of-Fit Index) = 0.987, AGFI (Adjusted Goodness-of-Fit Index) = 0.962, all higher than 0.9, meeting the value standard for fitting indexes. It can be seen that the fitting degree of the model and data was within the acceptable range.

Discussion

The quality of hope is highly important to individual development and is significantly related to academic achievement, mental health and physical health. It can foster and cultivate positive psychology in individuals, for example, improving one's well-being. In addition, it can also alleviate and regulate negative emotions such as depression, irritability and hostility [13,30]. Due to the long-term separation from their parents, left-behind children are unlikely to form a stable attachment relationship. As a result of the inaccessibility of timely help, emotional and material support, left-behind children are prone to negative emotions, and high incidence of psychological problems. The quality of hope may have an important role in regulating left-behind children's negative emotions and improving their positive emotions. Nevertheless, left-behind children are often faced with some obstacles to the development of the positive quality of hope due to the shortage of education, comfort and support, and therefore generally have a lower score in hope than non-left-behind

TABLE 3

Bootstrap analysis of mediating effect

	Effect value	Boot CI lower limit	Boot CI upper limit	Effect size
Direct effect	0.127	0.052	0.215	35.88%
Indirect effect	0.227	0.175	0.289	64.12%
Total effect	0.354	0.281	0.433	100%

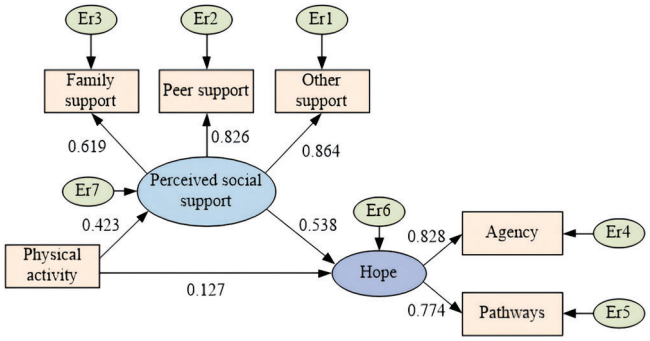

FIGURE 1. Mediation model of social support acting between physical activity and hope.

children [30]. Hence, improving and maintaining the level of hope in left-behind children is conducive to promoting their mental health.

Correlation between physical activity and hope in rural left-behind children

It was found in this study that physical activity can positively predict the level of hope in left-behind children. To be specific, those left-behind children who engage more frequently in physical activity have a higher level of hope. There may be the following reasons: first of all, physical activity in a constructive behavior that enables children to gain positive emotional experience and permanently maintain a favorable psychological state. Besides, left-behind children can obtain more self-efficacy and sense of achievement in physical activity or sports competitions, which is conducive to the enhancement of their self-confidence [31,32]. As a consequence, their level of hope would rise to some extent. Secondly, physical activity can exercise children's endurance and willpower, strengthen their competence to cope with difficulties and promote their ability to resist pressure. It can also reinforce their motivation and belief to complete tasks, cultivate their agency, and eventually boost up their sense of hope for life in all aspects. Finally, physical activity is not only related to exercising the body. Left-behind children can learn how to set reasonable goals, how to achieve their goals, and how to adjust their methods and strategies or goals in response to changes in the environment. The acquisition of these skills makes it more possible for left-behind children to solve problems, and thus improves their sense of hope. Therefore, it is suggested that school administrators should attach more importance to the participation of left-behind children in physical activity [33]. For example, they need to ensure the normal offering of physical education courses for rural left-behind children; rural schools can seek social help through public welfare activities to solve the problem of insufficient sports funds, so as to increase and improve the construction of sports facilities in schools and communities; children's interest in physical activity can be aroused and enhanced by organizing sports games and school sports meetings; in the attempt to engage children in physical activity, some events that can stimulate their positive emotional experience can be incorporated to cultivate the quality of hope in left-behind children.

Mediating effect of perceived social support

It was found in this study that perceived social support has a positive promoting effect on the level of hope in left-behind children. This result is consistent with the results of previous studies [10,34]. According to the main effect model of social support, social support has a general beneficial effect on the physical and mental health of individuals. As a kind of resource, social support provides left-behind children with emotional support and understanding, allows them to perceive more available resources to solve problems and face difficulties, and offers protection for left-behind children who are in a relatively vulnerable position. It can reduce their stress, anxiety, tension, depression and other adverse emotions. Its effect in stimulating and regulating resilience in response to stressors enables left-behind children to quickly recover from injuries or hardships, thus improving their level of hope. Additionally, social support makes left-behind children feel respected, supported and understood. With the perception of social support, left-behind children tend to believe that they are cared and loved. Consequently, they have stronger adaptability to the environment and higher-level hope for the future [35].

The results of this study also show that physical activity can indirectly predict the level of hope in left-behind children through perceived social support. Firstly, physical activity can positively predict perceived social support in left-behind children. This result is consistent with the results of previous studies [2,36]. When participating in physical activity, left-behind children can perceive social support more directly. On the one hand, paired or multiplayer sports events are remarkably characterized with team work. In the process of cooperating with team members in sports events, left-behind children can get guidance, assistance and encouragement from others. Meanwhile, they would also manage to help other team members, leading to the formation of a virtuous circle of mutual help. As a result, left-behind children can effectively improve their interpersonal interaction, shorten their emotional distance with others and attain more social support. At the same time, physical activity provides left-behind children with more opportunities to interact with their peers. Such interaction is conducive to expanding their social networks, optimizing their peer relationships, and bringing them peer support, teacher support or other support in the absence of family support [36,37].

According to the discussion above, active and regular participation in physical activity increases the channels for left-behind children to have more interpersonal interaction, expands their social networks, and enables them to obtain more objective or subjective social support. In addition, social support allows left-behind children to change their self-cognition and evaluation, maintain a positive psychological state, relieve pressure and bad emotions, and obtain protection. In brief, rural left-behind children who receive more social support are more likely to experience life with a positive attitude and have a higher level of hope for life in all aspects. Therefore, while advocating and encouraging physical activity, schools can cooperate with parents and teachers to give left-behind children more material and emotional support. The aim is to improve their level of hope, quality of life and mental health. Among a variety of sports options, schools are suggested to launch more group sports events that can contribute to peer relations, including school basketball and football [38].

Conclusion and Perspectives

Theoretical and practical significance

This study was conducted to examine the relationships among physical activity, perceived social support and hope in the group of rural left-behind children. It was found that physical activity can not only directly and positively predict the level of hope in rural left-behind children. It can also indirectly predict their sense of hope through perceived social support. Moreover, perceived social support was found to have a mediating effect on the relationship between physical activity and hope in rural left-behind children. These findings can deepen the understanding of left-behind children's sense of hope and have important implications for maintaining and improving rural left-behind children's mental health. Meanwhile, the results of this study also provide new methods and enlightenments for boosting up left-behind children's hope level. For instance, schools can directly improve left-behind children's sense of hope by encouraging them to participate in physical activity. Teachers and parents can promote left-behind children's sense of hope by giving them more material and emotional support.

Limitations and prospects

First of all, the self-rating questionnaire survey method was mainly adopted in this study to collect data, which may lead to certain deviation in the results. In the future, more objective evaluation methods should be applied for data collection. Secondly, the cross-sectional investigation model was used in this study. It is still necessary to further verify the results by employing the longitudinal research design. Finally, the participants selected in this study are mainly rural left-behind children in Hunan Province, China. This sample has certain limitations and affects the representativeness and universality of the research results. The survey scope should be appropriately expanded in the future.

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