



Motivation of University Students to Participate in Sports Club Activities Based on Structural Equation Model

Xiqiu Liu (✉)

Physical Education Teaching and Research Department, Hunan Institute of Technology,
Hengyang 421002, China
320007450@qq.com

Abstract. Taking 1050 college students from 5 universities in Hengyang city as the research object, based on self-efficacy theory and social ecological model, using structural equation model analysis method, this paper discusses the influencing factors of college students' participation in extracurricular sports clubs from individual and interpersonal level. The results showed that self-efficacy was the internal cause of college students' participation in sports associations, while peer support and teacher support were the external cause. Peer support has a significant positive effect on the exercise self-efficacy of college students. Teachers support the influence of college students' attitude and cognition to participate in sports clubs; Peer support has greater influence than teacher support.

Keywords: College students · Physical exercise · Sports associations · Peer support

1 Introduction

China has issued the Outline of the “Healthy China 2030” Plan, which once again puts the promotion of the health level of the people on the agenda. The Outline is an action program to guide and promote the construction of a healthy China, which requires a substantial improvement of the health level of the people from a wide range of factors affecting health. According to the Development Course of Chinese Students' Constitution Monitoring in 2017, the physical health level of Chinese college students is still in a downward trend, and the obesity rate only increases by about 3% every five years [1]. College students are the new force among the youth and the backbone of the country's future construction. College students' physical and mental health is closely related to their physical exercise level. Therefore, how to promote college students' extracurricular physical exercise is closely concerned by scholars [2].

Scholars' research on the influencing factors of college students' physical exercise behavior mostly starts from the self-efficacy theory, social ecological theory and environmental factors [3]. The methods used are mainly literature method, questionnaire survey method, interview method, observation method and statistical description

method. The application of mathematical model or structural equation model to analyze and research is not much, so it is inevitable to stay at the level of qualitative analysis, it is difficult to give the path and degree of influence between each influencing factor and college students & apos; physical exercise level.

The research on the self-organization form of college students & apos; physical exercise is mainly focused on the extracurricular sports associations in colleges and universities, which shoulder the extension of sports classes and are the main platform for extracurricular sports activities for college students. They can not only meet the needs of college students & apos; communication emotions, but also provide them with a stage to show themselves [4]. The content of the research on college sports associations is mainly reflected in the functional orientation, current situation and problems, supervision and management, organizational system and funding of sports associations, and the method is still qualitative analysis. However, the author has not found the corresponding answer to why college sports associations exist and what are the reasons for internal and external students.

This paper integrates the self-efficacy theory and social ecological model, adopts the structural equation model analysis method, and through the analysis of the influencing factors of college students' participation in extracurricular sports associations, attempts to answer from the source: the inevitability of the existence of college sports associations, the internal and external factors of college students & apos; participation in sports associations, the path and coefficient of each influencing factor.

2 Research Assumptions

According to the self-efficacy theory and social ecological model, this paper focuses on the individual factors that affect college students & apos; participation in sports community activities and focuses on the impact of physical education teachers and peers who directly contact college students on their participation in sports community activities. According to the interaction between the three psychological factors revealed by the theory, self-efficacy, behavior cognition and behavior attitude, as well as peer support The influence relationship between teachers & apos; support and college students & apos; participation in sports associations puts forward the following assumptions [5]:

H1: Peer support has a positive impact on college students & apos; participation in sports associations;

H2: Teacher support has a positive impact on college students & apos; participation in sports associations;

H3: Self efficacy, behavior attitude and behavior cognition have a positive relationship with the degree of participation in sports associations;

H4: Self efficacy, behavioral cognition and behavioral attitude play a mediating role in the influence of peer support on college students & apos; participation in sports associations;

H5: Self efficacy, behavioral cognition and behavioral attitude play a mediating role in the influence of teacher support on college students & apos; participation in sports associations;

H6: There is interaction among self-efficacy, behavior attitude and behavior cognition.

3 Research Objects and Methods

3.1 Samples and Sources

Students from 5 universities in Hengyang, including Nanhua University, Hengyang Normal University and Hunan Institute of Technology, are selected. The students in physical education classes were investigated by stratified random sampling. Each school distributed 210 questionnaires, and a total of 1050 questionnaires were distributed, from which 1028 were returned, and 1015 were valid after eliminating invalid questionnaires. Among them, 522 freshmen and 493 sophomores, accounting for 51.43% and 48.57% respectively; Separate boys and girls are 535 and 480, accounting for 52.71% and 47.29% respectively.

3.2 Measuring Tools

The measuring instruments were the participation in extracurricular sports associations scale, exercise self-efficacy scale, behavior attitude scale, behavior cognition scale and social support scale. The scale of the degree of participation in extracurricular sports associations was replaced by the scale of the degree of physical exercise behavior, and the revised PARS-3 [5] was adopted by Liang Deqing on the scale compiled by Japanese scholar Masao Hashimoto. The scale consists of 3 sub items, which are evaluated from the intensity, time and frequency of participating in exercise. The test-retest reliability of the scale is 0.756, Cronbach α) The coefficient is 0.685, which has good reliability and validity.

The exercise self-efficacy scale adopts the 5-level measurement revised by Li Zhe to the Exercise Self efficacy Scale compiled by Marcus, including 4 factors such as physical factor, activity factor, mental factor and conflict factor, and 18 subtopics. Each sub item is measured by Likert Level 5, from “completely impossible” to “definitely possible” and scored 1–5 points. In this study, the test-retest reliability of the scale is 0.783, Cronbach α) The coefficient is 0.85. The confirmatory factor analysis showed that: $\chi^2 = 158.898$, RMSEA = 0.056, SRMR = 0.043, TLI = 0.958, CFI = 0.973, indicating that this scale has the behavioral attitude and behavioral cognition subscale in Mao Rongjian & apos; s Exercise Attitude Scale [5]. Among them, the behavioral attitude subscale includes 8 sub items, and the behavioral cognition subscale includes 7 sub items, all of which are measured by Likert 5. In this study, Cronbach of the two subscales α) The coefficients are 0.772 and 0.951, respectively. The confirmatory factor analysis showed that: χ^2 were 13.986 and 5.923 respectively, RMSEA was 0.078 and 0.046 respectively, SRMR was 0.015 and 0.013 respectively, TLI was 0.987 and 0.996 respectively, CFI was 0.994 and 0.993 respectively, indicating that the scale has good reliability and validity.

The social support scale adopts the subscale of teacher support and peer support in Chen Shanping & apos; s Exercise Participation Social Support Scale. There are 6 questions in the scale, 3 for teachers and 3 for peer support. All are reverse scoring questions, which are measured by Likert Level 5, and scored according to 5~1 from “completely agree” to “very disagree”. Cronbach of the two subscales in this study α) The coefficients are 0.873 and 0.852 respectively. The confirmatory factor analysis

showed that: $\chi^2 = 6.467$, $RMSEA = 0.73$, $SRMR = 0.035$, $TLI = 0.974$, $CFI = 0.986$, indicating that the scale has good reliability and validity.

3.3 Reliability and Validity Test of Measurement Tools

Exploratory factor analysis showed that KMO of the total table was 0.823, $\chi^2 = 21385.43$, $df = 741$, $Sig = 0.000$, the internal reliability of each scale meets the requirements. The retest method was used to measure the external reliability of the questionnaire, and the retest reliability coefficient was 0.756 ($P < 0.01$).

4 Model Establishment

Structural equation model is a statistical method to analyze the relationship between variables based on the covariance matrix of variables. It integrates factor analysis and path analysis. It is not only suitable for exploring the impact of multiple variables on dependent variables, but also for analyzing the internal relationship between potential variables and indicators and potential variables [6]. Therefore, this method can more accurately study the multiple factors and path relationships that affect college students' physical exercise behavior. Structural equation model includes measurement model and structural model.

The measurement model expression is:

$$x = \Lambda x\xi + \delta \tag{1}$$

$$y = \Lambda y\eta + \varepsilon \tag{2}$$

Where, x represents the indicator combination vector of exogenous potential variables, y represents the indicator combination vector of endogenous potential variables, λ represents the relationship between X and exogenous potential variables, is the factor load matrix of X on exogenous potential variables, λ represents the relationship between Y and endogenous potential variables, is the factor load matrix of Y on endogenous variables, δ and ε The error terms of X and Y are respectively represented [7].

The structural model expression is:

$$\eta = B\eta + \Gamma\xi + \zeta \tag{3}$$

Among them, η Represents an endogenous latent variable, ξ Is the exogenous latent variable, and B is the relationship vector between endogenous latent variables, Γ It represents the relationship vector between exogenous latent variables and endogenous latent variables, ζ Represents the residual item.

5 Results and Analysis

5.1 Model Correction and Matching

AMOS26.0 software and structural equation model were used for data analysis and model validation. All model data were consistent with the univariate normal distribution, but the kurtosis value of multivariate variables was 15.49 (should be less than 5). The overall model did not conform to the multivariate normal. Bollen Stine Bootstrap ($n = 2000$) method is adopted for correction, and Bollen Stine is used to correct the chi square value. The modified model fitness indicators are within the standard range recommended by Hult et al. [8], namely, $\chi^2/df = 1.18$, RMSEA = 0.01, TLI = 1, CFI = 1, IFI = 1, AGFI = 0.97, Hoelster's Critical N(CN) = 917.45. It shows that the model fits well.

5.2 Relationship Between Factors and Paths in the Model

The interpersonal level in the model is mainly composed of two indicators: teacher support and peer support. The individual level is mainly composed of three indicators: exercise self-efficacy, exercise behavior attitude and exercise behavior cognition. The path relationship between them is: (1) In terms of exercise self-efficacy, peer support has a significant impact on exercise self-efficacy ($\beta = 0.146$, $P = 0.001$), and teacher support has no significant impact on exercise self-efficacy. (2) In terms of exercise cognition, teacher support has a significant impact on college students' exercise behavior cognition ($\beta = 0.173$, $P < 0.001$), while peer support had no significant effect on exercise behavior cognition; Self efficacy has a significant impact on exercise behavior cognition ($\beta = 0.17$, $P < 0.001$). (3) In terms of community participation behavior, exercise self-efficacy and exercise behavior attitude reached a significant level on the degree of community participation, and the standardized regression coefficients were 0.285 and 0.152 respectively ($P < 0.001$), while exercise behavior cognition had no significant impact; Peer support has a significant impact on college students' participation in associations ($\beta = 0.12$, $P < 0.001$), but teacher support has no significant impact. (4) In terms of exercise attitude, teacher support and peer support cannot significantly affect exercise behavior attitude. Only through exercise self-efficacy and exercise behavior cognition can they affect exercise behavior attitude β . The values were 0.508 and 0.149 respectively ($P < 0.001$).

The maximum likelihood method is used to estimate the value of each path coefficient. By analyzing the parameters in Table 1, the path and path effect value of the influencing factors of college students' physical exercise behavior are obtained (see Table 2).

The cognition of exercise behavior and attitude of exercise behavior indirectly affect the degree of participation in the community, or the cognition of exercise behavior and attitude of exercise behavior are intermediary variables of teacher support affecting the degree of participation in the community (i.e. H5 is established); Teacher support does not affect students' exercise self-efficacy. (2) Peer support can affect the degree of exercise behavior through four paths, and its direct impact is greater than teacher support (i.e. H4 is established). (3) Exercise self-efficacy has the greatest overall effect on the degree of participation in the community, which has both direct effects and affects the

Table 1. Analysis results of path relationship of each factor

Path	Normalized regression coefficient	Standard error	Critical value	P
Peer support → exercise behavior cognition	-0.023	0.034	0.617	0.537
Exercise self-efficacy → exercise behavior and attitude	0.508	0.081	10.165	0.000
Peer support → exercise behavior and attitude	0.044	0.040	1.269	0.204
Teacher support → exercise behavior and attitude	0.046	0.042	1.326	0.185
Peer support → exercise self-efficacy	0.146	0.032	3.281	0.001
Teacher support → exercise self-efficacy	0.024	0.034	0.542	0.588
Exercise self-efficacy → exercise behavioral cognition	0.170	0.052	4.055	0.000
Teacher support → exercise behavior cognition	0.173	0.032	4.576	0.000
Exercise Behavior Cognition → Exercise Behavior Attitude	0.149	0.043	4.490	0.000
Exercise self-efficacy → degree of participation in clubs	0.285	0.069	5.790	0.000
Peer support → degree of community participation	0.120	0.034	3.567	0.000
Exercise behavior attitude → degree of participation in clubs	0.152	0.035	3.703	0.000
Cognition of exercise behavior → degree of participation in community	0.012	0.036	0.380	0.704

Note: Self Drawing

degree of participation in the community through two paths: exercise behavior cognition and exercise behavior attitude (that is, the establishment of H1 and H3). (4) Exercise behavior cognition and exercise self-efficacy affect exercise behavior attitude, exercise self-efficacy affects exercise behavior cognition, but exercise behavior cognition does not affect exercise self-efficacy (i.e. H6 part is established).

Table 2. Path Effect Values of Various

	Path	Direct effect	Indirect effect	Total effect
companion support	Exercise self-efficacy	0.146	0.000	0.146
	Exercise Behavior Cognition	-0.023	0.025	0.002
	Exercise behavior and attitude	0.044	0.074	0.180
	Degree of participation in associations	0.120	0.060	0.179
Teacher support	Exercise self-efficacy	0.024	0.000	0.024
	Exercise behavior	0.173	0.004	0.177
	Exercise behavior and attitude	0.046	0.038	0.084
	Degree of participation in associations	-0.026	0.022	-0.004
Exercise self-efficacy	Exercise Behavior Cognition	0.170	0.000	0.170
	Exercise behavior and attitude	0.508	0.025	0.533
	Degree of participation in associations	0.285	0.053	0.368
Exercise behavior	Exercise self-efficacy	0.000	0.000	0.000

Note: Self Drawing

6 Discussion and Suggestions

According to the different research objects, the differences of the selected variables on the population impact should be considered when establishing the model. The subject group of this study is college students, most of whom live in schools, so community level and family environment factors have little impact on their activities. Studies by Chang Sheng and Wu Zeping have shown that the relationship between parents and college students' physical exercise behavior is low and negative, and the relationship between parents and college students' participation in physical exercise is not close [9]. College students have a strong sense of autonomy and independence, and their peers and teachers play a greater role in influencing factors of their physical exercise behavior. Therefore, this study did not include the influence factors of parents. Because college students have few opportunities and time to contact the outside society, this study focuses on the influence of teachers and peers on college students' exercise behavior. Today, with the popularity of the Internet, this model does not include many factors that affect college students &

and participation in sports community exercise, such as sports intelligent equipment, sports APP and so on.

Why college students participate in extracurricular sports associations, or why sports associations exist, is mainly driven by the needs of college students and individual psychology. At the same time, peer support and teacher support also play an important role. Therefore, to promote the physical and mental health of college students and improve the level of extracurricular physical exercise, we should focus on creating an organizational atmosphere and external environment for college students and their peers to exercise together, strengthen the construction and management of sports associations, and strengthen the positive feedback effect between sports associations and peer support. At the same time, we should reform teachers' teaching methods, not only pay attention to the improvement of classroom teaching quality, but also pay attention to the guidance and support of students' extracurricular activities, integrate emotional attitudes and values, and enhance students' awareness of the value of extracurricular physical exercise behavior.

7 Conclusion

The model analysis results show that the three indicators at the individual psychological level have a significant impact on the degree of college students' participation in extracurricular sports community exercise behavior, that is, the greater the sense of self-efficacy, the higher the exercise cognition and the more active the exercise attitude, the higher the degree of college students' participation. Among them, the direct influence of self-efficacy is higher than that of exercise attitude. Bandura's social cognitive theory also supports this view [10]. The study found that peer support had a significant positive impact on self-efficacy, while teacher support had no significant impact on exercise self-efficacy. The reasons for this result may be: first, the fewer physical education classes in colleges and universities have reduced the influence of physical education teachers on college students' participation in sports community activities; second, for college students, they spend most of their time learning and living with their peers on campus. Both physical and mental aspects need to establish close relationships with their peers, and more need their recognition and support. Therefore, it is not surprising that peer support will have an important impact on college students' behavior; Although teacher support does not have a significant direct impact on college students' participation in physical exercise, path analysis found that teacher support factors indirectly affect college students' physical exercise behavior through individual level exercise cognition and exercise attitude, that is, teacher support for college students can improve their physical exercise cognition, thus affect their physical exercise attitude, and ultimately promote college students' habit of extracurricular physical exercise behavior.

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