Using SEM Model to Investigate the Sports Health Behavior of College Students

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Abstract. In order to grasp the physical health behavior of college students and improve the frequency of college students' physical health behavior, this paper uses the SEM model to conduct an in-depth investigation and analysis of the physical health behavior of college students. Using the SEM model, it can be learned that the focus of college students' physical health behavior intervention is emotional regulation, health knowledge popularization and exercise environment. The results calculated by the SEM model can help colleges and universities to improve the physical fitness of college students purposefully.

Key words: SEM model; sports; health behavior

1 Introduction

Physical quality is an important module to cultivate students. Colleges and universities should improve students' physical quality and exercise their physical fitness through various ways. In the traditional physical exercise research, the survey is generally conducted by questionnaire or by collecting students' physical education test results, and the scientific rationality of the questionnaire cannot be guaranteed. In order to make the relevant measures to promote students' exercise more complete and more targeted, this paper conducts a relevant survey on college students. This paper provides a complete sports and health behavior survey report for college students. In this report, the students' awareness of physical exercise, physical health knowledge, emotional regulation and environmental adaptability were investigated. After setting this questionnaire, the validity of the Krumbaha coefficient test. Finally, this paper constructs an intervention model and proposes effective measures to improve the frequency of physical health behavior. Compared with the previous survey of student sports health behavior, the questionnaire proposed in this paper has been scientifically tested scientifically, and its results are more scientifically reasonable.

2 SEM model

The SEM model is a structural equation model, which is a multivariate statistical method that combines factor analysis and path analysis [1]. Compared with other statistical methods, the

SEM model can quantitatively study the interaction between multiple variables, so the SEM model is more and more widely used in social science and behavioral science [2].

Two types of variables are included in the SEM model, namely observational variables and structural variables [3]. An observed variable is a variable that can be investigated through interviews or other means. Structural variables are variables that cannot be directly observed. In the investigation and research of a thing, there will be many variables, and these variables affect each other [4]. Relationships between variables can be calculated. Calculated values that describe the relationship between variables are called parameters. The larger the parameter value, the greater the influence of the variable on the result. If the parameter values can be accurately calculated in a scientific way, the key performance factors that influence the results can be identified. Therefore, in many enterprise management, SEM model is also used to study user satisfaction [5].

Compared with other statistical methods, the SEM model has unique advantages. The SEM model can display the driving force analysis in three-dimensional and multi-level [6]. The emergence of a thing is bound to be accompanied by the influence of many factors. In the traditional regression analysis, there is no investigation and analysis from multiple levels. The multi-level causal relationship is more in line with the development and way of thinking of human society. SEM models allow analysis of properties that cannot be measured directly. This advantage of the SEM model can expand the scope of data analysis. Compared with the traditional analysis method, the SEM model can analyze some more abstract inductive properties. SEM analysis can quantify the causal relationship between attributes [7]. The SEM model puts the causal relationship on the same level for comparison, and the analysis of the data is more in-depth. As shown in Figure 1.
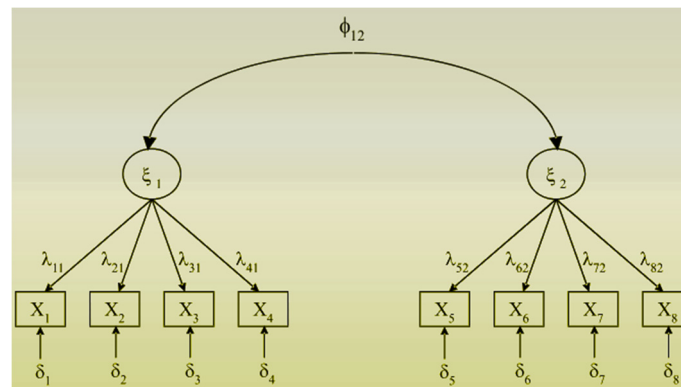

Figure 1: SEM model

3 Research methods and research objects

This paper mainly adopts the literature data method and the questionnaire survey method. In this study, the documents with "healthy behavior and physical health" in the literature database are used as the theoretical basis of the research [8]. Taking the theoretical basis as the basis of

the research, a questionnaire survey was set up. The questions in the questionnaire are set according to the principles of acceptability and logic. There are a total of 5 structural variables and 16 observational variables in the questionnaire [9]. The questionnaire uses the Likert scale, and the continuous scale is set as seven-point scale, and each scale corresponds to a different score. This study selected 340 students from a university as the research object. A total of 340 questionnaires were distributed, and 340 valid questionnaires were recovered, with an effective recovery rate of 100%.

This study used the statistical software AMOS as a tool to test the validity of the questionnaire. At the same time, AMOS is also an important tool for constructing intervention models [10].

4 Investigation System

4.1 The investigation system proposed in this paper

This study sets up three-level indicators, in which the structural variables are the second-level indicators, and the observation variables are the third-level indicators [11]. The specific index system of the questionnaire is shown in Table 1.

Table 1: Index system of college students' sports health behavior survey

first-level indicator	Secondary indicators	three-level indicator
sports health behavior	exercise awareness	own needs(ec1)
		hobby(ec2)
		Partner atmosphere(ec3)
		family Education(ec4)
	health knowledge	Basic health knowledge(hk1)
		scientific exercise knowledge(hk2)
		prevent sports injuries(hk3)
		The teaching of health knowledge in schools(hk4)
	emotion regulation	Ability to regulate exercise anxiety(er1)
		cause of anxiety(er2)
		Concentration(er3)
		desire to win(er4)
	environmental adaptation	Feelings about changes in sports grounds(ea1)
		Differences in exercise culture(ea2)
		The influence of negative atmosphere(ea3)
		Ability to handle interpersonal relationships(ea4)

4.2 Reliability test of the survey system

Reliability test is to use the same method to conduct repeated tests on unified objects. The higher the consistency of the results, the more credible the survey system is. In this study, the Cronbach coefficient was used for testing [12]. The larger the Cronbach value, the stronger the consistency

of the questionnaire. According to previous investigations and studies, most scholars believe that the Cronbach's value greater than 0.7 indicates good consistency [13]. Table 2 is the Cronbach's coefficient table of this research questionnaire.

Table 2: Cronbach's coefficient table

latent variable	Cronbachs Alpha	number of items
overall	0.965	16
Exercise awareness dimension	0.854	4
\health knowledge dimension	0.798	4
Emotional control dimension	0.821	4
environmental adaptation dimension	0.795	4

The data in the table shows that this questionnaire has strong credibility and stability.

4.3 Validity test of the survey system

Validity refers to the degree to which a measurement tool or means can accurately measure what needs to be measured [14]. For the test of validity, this study used content validity test and AMOS confirmatory factor analysis. In confirmatory factor analysis, construct validity, discriminant validity and convergent validity were included. Bartlett (Bartlett Test of Sphericity) and KMO (Kaiser-Meyer-Olkin) sphericity test can judge whether the data is suitable for factor analysis. The closer the KMO measure is to 1, the stronger the correlation of the data, which can be used for factor analysis. The analysis results are shown in Table 3.

Table3. Validity test of the survey system

Take the Kaiser- Meyer- Olkin measure of sufficiency		0.975
Bartlett's sphericity test	approximate chi-square	3396.58
	df	120
	Sig.	0.00

Normal values for KMO degrees are between 0.7 and 1. It can be seen from Table 3 that this questionnaire is highly effective and suitable for confirmatory factor analysis.

5 Sports health behavior intervention model

Based on the relevant research on the literature database, AMOS is used to initially construct the sports health behavior intervention model for middle school students ([15]. According to the finalized sports health behavior survey indicators, the four dimensions of exercise awareness,

health knowledge, emotional control and environmental adaptation are assumed as hypotheses. For the four latent variables of the model, 16 items that have been tested by the reliability of the questionnaire are used as observation indicators [16].

Through the analysis of the research results, it can be known that the residual item (e10) of the regulation ability of motor anxiety (er2) and the residual item (e13) of exercise ability (ea1) have the largest MI coefficient value of 20.241, followed by The MI coefficient value between the residual term (e8) of the school education factor (hk4) and the residual term (e14) of the collective climate (ea2) was 10.854. According to this data, the final result of the college students' sports health behavior intervention model is shown in Figure 2.
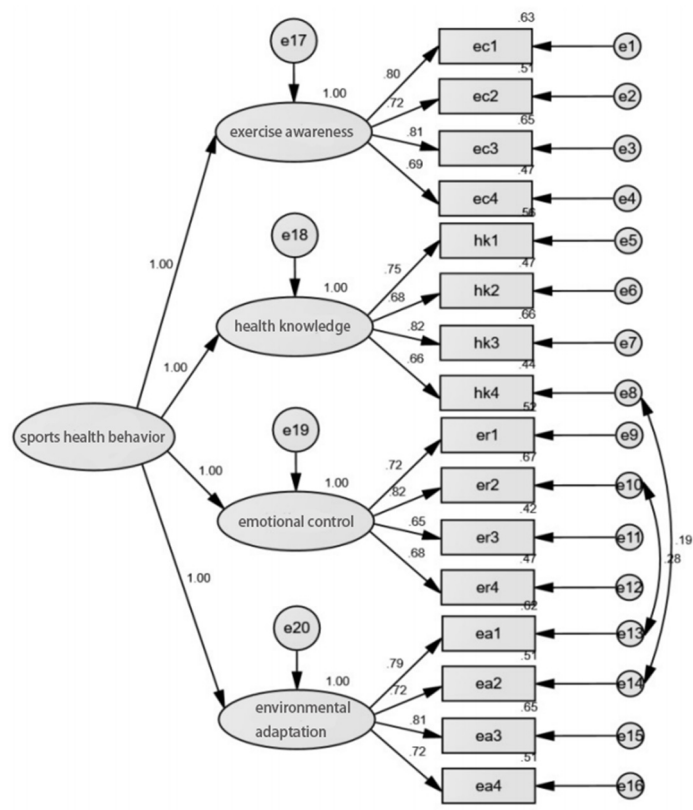

Figure 2: Intervention Model for College Students' Sports Health Behavior

6 Conclusion

This paper uses the questionnaire survey method and the literature data method to continue the questionnaire survey on the students. Before conducting the questionnaire survey, this study tested the reliability and validity of the questionnaire and obtained good results. After the questionnaire survey results were recovered, this study constructed a relationship model among

16 observation indicators, and proposed an intervention model. From the structure of the study, it can be concluded that colleges and universities should guide students to focus and improve their self-awareness. Colleges and universities should offer courses on basic physical health knowledge, and provide students with a variety of physical exercise methods and a friendly physical exercise environment.

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