The Relationship between Exercise Participation Satisfaction, Exercise Commitment, and Exercise Adherence Intention according to Peer Relationships among Korean School Sports Club Participants

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Article

The Relationship between Exercise Participation Satisfaction, Exercise Commitment, and Exercise Adherence Intention according to Peer Relationships among Korean School Sports Club Participants

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Abstract: Introduction: This study explored the structural relationship between peer relations, exercise participation satisfaction, exercise commitment, and adherence to intention to exercise among Korean sports club participants. The objective was to offer insights that can enhance intentions for continuous exercise participation. Methods: To fulfill this objective, data were gathered using snowball sampling from teenagers at middle schools in Seoul and Gyeonggi, South Korea, who either currently participate in school sports clubs or have participated in the past. A total of 261 responses were analyzed using frequency, technical statistics, and confirmatory factor, reliability, correlation, and structural equation model analyses. Results: Through these analyses, this study found that peer relationships, exercise participation satisfaction, and exercise commitment were significant as both direct and indirect influences on exercise adherence intentions. Discussion: Intervention strategies should focus on fostering the positive emotions that stem from peer relationships.

Keywords: Korean school sports clubs; peer relationship; exercise participation satisfaction; exercise commitment; exercise adherence intention

1. Introduction

As the value of individuality and personal time becomes increasingly significant, there is a growing societal interest in work-life balance. This heightened attention has spurred teenagers, who often engage in fierce competition for entrance exams, to seek a balance between their studies and everyday lives [1]. Physical activity is expected to be a pivotal factor in achieving a study-life balance among adolescents. Considering that leisure activities play a crucial role in enhancing quality of life [2], physical pursuits, especially sports participation, are particularly important. They serve as a counterbalance in Korea's entrance exam-focused educational environment, which often tilts the scale unfavorably between the students' lives and their academic commitments [3].

Despite the recognized importance of physical activity, Korean teenagers' participation rate in such activity has been declining. Numerous studies indicate that most Korean teenagers prefer sedentary activities such as computer gaming and watching TV [1,3,4]. This trend intensified in the COVID-19 pandemic. Given that this shift can lead to physical and mental health issues beyond just impacting leisure time, it is crucial to devise strategies to promote physical activity in adolescents.

Efforts to promote physical activity in adolescents need to consider the intention to continue such activity and this factor has been investigated in various contexts related to exercise engagement. 'Exercise adherence' is defined as regular and direct participation in physical activity. This includes metrics such as exercise frequency, intensity, duration, and overall physical activity [5–7]. Notably, exercise adherence is distinct from exercise participation. It emphasizes sustained engagement,

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making it more significant in terms of meaning and importance. Choi and Kim [8] highlight that investigating exercise adherence could offer valuable insights into encouraging consistent participation in regular exercise and physical activity programs.

Prior research on exercise adherence has highlighted that positive emotions derived from physical activities, such as exercise participation satisfaction and commitment, can significantly influence an individual's intention to continue exercising. Here, "exercise participation satisfaction" is understood as the positive perception or emotion developed through the act of participating in exercise, viewed from the perspective of leisure satisfaction [9]. By contrast, "exercise commitment" pertains to the hope, belief, and conviction acquired through engaging in physical activity that it is worth pursuing, combined with the desire for sustained participation [10,11].

Previous research [12–16] has established that satisfaction and commitment are key predictors of exercise adherence. Empirically, studies by Park and Lee [17] and Yang and Lee [18] underscored that among Korean school sports club participants, satisfaction with exercise participation and commitment could serve as vital determinants of exercise adherence.

Peer relationships are regarded as a pivotal characteristic of adolescents. A "peer relationship" is defined as a systematic and ongoing dynamic interaction [19,20] between individuals who share emotional bonds. This concept has been explored in the contexts of interpersonal relationships, friendships, and teenage bonds. Csikszentmihalyi and Larson [21] observed that in contrast to childhood, peer relationships in adolescence can significantly influence an individual's emotional state across various situations, especially as the time spent with peers increases. Supporting this perspective, Rain et al. [22] posit that satisfaction derived from one life domain could spill over into another. Earlier research [23–26] had indicated that an individual's emotional response to physical activity might shift based on social relationships.

Drawing on previous studies that demonstrate the influence of peer relationships on satisfaction [27–30], commitment [31,32], adherence, and dropout intentions [33–35], these elements may be expected to share a structural relationship. Furthermore, peer relationships may be projected to serve as predictors of exercise participation, satisfaction, commitment, and adherence intention.

However, prior studies on the interplay between peer relationships, exercise participation satisfaction, exercise commitment, and exercise adherence intention have not comprehensively explored their interconnectedness. There is a noticeable gap in research examining the ties between satisfaction, commitment, and intention. This results in an incomplete understanding of the structural relationships between these variables in an empirical setting.

Therefore, this study aimed to explore the structural relationships among peer relationships, exercise participation satisfaction, exercise commitment, and exercise adherence intention among participants in school sports clubs by utilizing a structural equation model. “Sports clubs” refer to a regular part of the curriculum introduced across all Korean middle schools in 2007 to address the decline in physical activity and growing disinterest in leisure activities among teenagers, thereby encouraging autonomous sports activities for students [36]. Considering the significant time constraints that Korean teenagers face in physical activity, primarily due to the education system’s focus on college entrance exams, exploring these relationships within the context of school sports clubs has substantial relevance, is novel, and offers the prospect of useful findings.

This study explored the structural relationships between peer relationships, exercise participation satisfaction, exercise commitment, and exercise adherence intention in the context of school sports club participants with the aim to offer valuable insights into devising effective strategies tailored to promote consistent exercise habits, taking into account the unique situations and traits of Korean adolescents.

Past research indicates that factors such as peer relationships, exercise participation satisfaction, and exercise commitment positively influence exercise adherence intention [27–32,37]. Notably, peer relationships have been shown to bolster both satisfaction and exercise commitment [12–18]. Thus, it was anticipated that similar relationships would emerge among participants of school sports clubs in relation to peer interactions, satisfaction with exercise participation, commitment, and the intention to continue exercising. Seven hypotheses were formulated.

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H1: Peer relationships among school sports club participants would have a significant effect on exercise participation satisfaction.

H2: Peer relationships among school sports club participants would have a significant effect on exercise commitment.

H3: Peer relationships among school sports club participants would have a significant effect on exercise adherence intentions.

H4: Exercise participation satisfaction in school sports club participants would have a significant effect on exercise adherence intention.

H5: Exercise commitment of school sports participants would have a significant effect on their exercise adherence intention.

Drawing from prior research, it was anticipated that satisfaction and commitment with exercise participation would significantly affect the relationship between peer relationships and exercise adherence intention among school sports club participants. Peer relationships foster positive emotions, such as satisfaction with exercise participation and commitment, which in turn can increase the propensity for sustained exercise adherence. This understanding is supported by the findings from Kim [38], which highlighted the mediating roles of adherence and satisfaction in the relationship between social support from elementary school sports club leaders and the intention to adhere to exercise.

However, there is a notable gap in research probing the structural relationship between satisfaction, commitment, and intention, especially when centered on peer relationships. Furthermore, empirical studies of school sports club participants are scarce. To explore this relationship and related mediating effects among these types of participants, the following hypotheses were formulated.

H6: Satisfaction with exercise participation would have a mediating effect on the relationship between the peer relationships of school sports club participants and exercise adherence intention.

H7: Exercise commitment would mediate the relationship between the peer relationships of school sports club participants and exercise adherence intention.

2. Materials and Methods

2.1. Participants and procedure

The data for this study were collected between September and November 2022 using snowball sampling. The participants were teenagers who were either actively enrolled in school sports clubs or participated in after-school activities at middle schools in Seoul and Gyeonggi, South Korea. During the data collection process, respondents were briefed on the research purpose, background, and duration of participation via online links shared through messages and social media platforms. In addition, the participants were requested to complete an online informed consent form. No ethical approval was necessary since the survey was conducted anonymously. The survey breakdown of the collected samples was as follows. Of the participants, 166 were male (63.6%) and 95 were female (36.4%). Based on grade level, 74 were first graders (28.4%), 98 were second graders (37.5%), and 89 were third graders (34.1%).

2.2. Measurement

The questionnaire comprised four content areas: peer relationships, satisfaction with exercise participation, exercise commitment, and exercise adherence intention. Existing scales were adapted to fit the context of this study.

The study used the peer relationship scale developed by Kim [38] based on questionnaires previously used by Park and Kim [39] and further modified and supplemented to suit physical activity participants by Park [40] and Lee [41]. The exercise participation satisfaction scale used in this study was adapted from Beard and Ragheb's Leisure Satisfaction Scale [9], which was revised and supplemented in relation to physical activity based on findings from previous studies [42,43].

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The exercise commitment scale used in this study was developed from a sports immersion model by Scanlan et al. [11]; it also utilized an exercise commitment test modified and supplemented by Jung [44] to reflect the Korean context. Finally, the exercise adherence intention scale was developed based on a Korean-style exercise adherence test paper developed by Choi [45] in relation to multiple previous studies [46–50].

All items on the questionnaire utilized a 5-point Likert scale, with scores ranging from 1 (strongly disagree) to 5 (strongly agree). To ensure accuracy, the survey measurements were first reviewed by three highly trained experts (all with PhDs) in sports psychology to confirm both facial and content validity, that is, the appropriateness of the wording and context.

2.3. Data analysis

A total of 261 questionnaire responses were used in the final validation sample. For data analysis, IBM SPSS ver. 26.0 software was employed for frequency, descriptive, reliability, and correlation analyses. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were performed using IBM AMOS ver. 21.0 software. The significance of specific indirect effects was assessed through bootstrapping, considering the characteristics of the research model.

3. Results

Data normality was assessed using skewness and kurtosis values. All values obtained conformed to the recommended criteria [51]. Specifically, skewness values ranged from -0.819 to 0.225, while kurtosis values were between -2.368 and -2.992. Given that the acceptable limits for skewness and kurtosis are ±2 and ±7 respectively, the data met the normality assumption.

3.1. Measurement model

To examine the validity and reliability of the measurement tool, we conducted a confirmatory factor analysis of the measurement model and a reliability analysis using Cronbach's α coefficient. The results met the criteria for the model fit test indices, with average variance extracted (AVE) values ranging from .568 to .845, critical values ranging from .798 to .961, and reliability coefficients from .838 to .975. These results indicate satisfactory construct validity and reliability [52–54]. Moreover, the AVE index (.568) exceeded the squared correlation coefficient value (.480) of the maximum correlation (.693), indicating satisfactory discriminant validity [55,56]. The relevant details are presented in Tables 1 and 2.

Table 1. Measurement properties of the first-order latent constructs.

Construct and Item	λ	α	AVE	C.R.
Peer Relationship (PR)				
Presence of Friendship (PF)		.939	.719	.928
PF 1	.869			
PF 2	.832			
PF 3	.896			
PF 4	.871			
PF 6	.881			
Continuation of Relationship (CR)		.897	.676	.893
CR 7	.860			
CR 9	.766			
CR 10	.819			
CR 11	.863			
Friend Adaptation (FA)		.914	.681	.895
FA 13	.845			
FA 14	.875			
FA 15	.840			

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FA 17	.853		
Co-living (CL)	.862	.649	.846
CL18	.753		
CL 19	.852		
CL 20	.868		
Exercise Participation Satisfaction (EPS)			
Inside Psychology (IP)	.971	.832	.961
IP 1	.926		
IP 2	.934		
IP 3	.962		
IP 4	.945		
IP 5	.899		
Social Satisfaction (SS)	.975	.881	.967
SS 7	.947		
SS 8	.972		
SS 9	.953		
SS 10	.942		
Physical Satisfaction (PS)	.952	.784	.935
PS 11	.903		
PS 13	.895		
PS 14	.923		
PS 15	.926		
Environmental Satisfaction (ES)	.970	.845	.956
ES 16	.909		
ES 17	.962		
ES 18	.961		
ES 19	.946		
Exercise Commitment (EC)			
Cognitive Commitment (CC)	.944	.727	.914
CC 3	.964		
CC 4	.811		
CC 5	.810		
CC 6	.960		
Behavioral Commitment (BC)	.929	.739	.919
BC 8	.872		
BC 9	.886		
BC 11	.870		
BC 12	.875		
Exercise Adherence intention (EA)			
Exercise Ability (ExA)	.877	.689	.869
ExA 1	.863		
ExA 2	.820		
ExA 4	.837		
Exercise Habit (ExH)	.880	.658	.852
ExH 5	.800		
ExH 6	.894		
ExH 7	.842		
Exercise Environment (ExE)	.918	.700	.903
ExE 8	.837		
ExE 9	.827		
ExE 10	.836		
ExE 11	.929		

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Exercise Interest (ExI)		.838	.568	.798
ExI 12	.772			
ExI 13	.796			
ExI 14	.823			
Exercise Friend (ExF)		.861	.652	.847
ExF15	.702			
ExF 16	.867			
ExF 17	.915			

Note: λ = Factor loading; α = Cronbach's alpha; CR = Composite reliability; AVE = Average variance extracted.

Table 2. Means, standard deviations, and bivariate correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1														
2	.656**	1													
3	.693**	.631**	1												
4	.654**	.660**	.649**	1											
5	.573**	.585**	.543**	.505**	1										
6	.504**	.452**	.487**	.431**	.484**	1									
7	.518**	.526**	.495**	.471**	.553**	.567**	1								
8	.533**	.560**	.493**	.473**	.583**	.623**	.629**	1							
9	.500**	.415**	.431**	.410**	.390**	.457**	.449**	.516**	1						
10	.457**	.489**	.399**	.364**	.515**	.374**	.483**	.424**	.479**	1					
11	.693**	.678**	.627**	.613**	.683**	.507**	.595**	.633**	.454**	.588**	1				
12	.581**	.538**	.528**	.519**	.575**	.472**	.540**	.508**	.447**	.450**	.644**	1			
13	.602**	.549**	.614**	.528**	.487**	.478**	.486**	.526**	.488**	.399**	.595**	.603**	1		
14	.587**	.535**	.539**	.538**	.552**	.508**	.501**	.567**	.504**	.477**	.643**	.553**	.498**	1	
15	.648**	.600**	.594**	.603**	.578**	.488**	.530**	.550**	.544**	.475**	.643**	.567**	.674**	.673**	1
M	3.714	3.614	3.609	3.622	3.540	3.833	3.582	3.738	3.460	3.260	3.642	3.561	3.592	3.235	3.497
SD	.990	.895	1.001	.957	1.111	1.127	1.097	1.189	1.071	.981	.932	1.017	.987	1.004	.988

Note 1= presence of friendship; 2= continuation of relationship; 3=friend adaptation; 4=co-living; 5= internal psychology; 6=social satisfaction; 7=physical satisfaction; 8=environmental satisfaction; 9=cognitive commitment; 10= behavioral commitment; 11=exercise ability; 12=exercise habit; 13=exercise environment; 14=exercise interest; 15=exercise friend; **$p < .05$.

3.2. Hypotheses Testing

After assessing the fit of the structural equation model prior to hypothesis testing, the results indicated a suitable fit for the hypothesis equation in this study. The statistics were as follows: χ^2 = 181.304, df = 85, comparative fit index (CFI) = .961, Tucker-Lewis index (TLI) = .952, standardized root mean square residual (SRMR) = .040, and root mean square error of approximation (RMSEA) = .066 [53,54].

Based on the suitability of the estimated research model, the verification results of the research hypotheses proposed to investigate the structural relationship among peer relations, exercise participation satisfaction, exercise commitment, and exercise continuation were as follows. First, the statistical significance of peer relationships in relation to exercise participation satisfaction and exercise commitment was verified, and therefore, H1 (b = .866, β = .855, p < .001) and H2 (b = .733, β = .823, p < .001) were confirmed. Second, the statistical significance of peer relationships, exercise participation satisfaction, and exercise commitment in relation to exercise continuation intention was verified; thus, H3 (b = .427, β = .451, p < .001), H4 (b = .309, β = .331, p < .01), and H5 (b = .281, β = .264, p < .001) were confirmed.

Given that our research model comprises a parallel multiple-mediator model structure, it was essential to estimate specific indirect effects. In multi-mediator models with several indirect effects, a 'specific indirect effect' pertains to the indirect effect associated with a particular variable. This

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estimation is significant because the indirect effect typically calculated in AMOS represents the total indirect effect.

Using the IBM AMOS software, the phantom variable technique was employed to estimate specific indirect effects and evaluate their significance. The detailed outcomes of the analysis derived from the phantom variable estimation are outlined in Table 3 and Figure 1. First, regarding the relationship between peer relationships and exercise adherence intention, the specific indirect effects of satisfaction with exercise participation and commitment were b = .268 and b = .206, respectively. Both H6 ($p < .01$) and H7 ($p < .05$) were confirmed, and their significance was substantiated using nonparametric bootstrapping.

Table 3. Results of structural equation modeling.

	Path of Latent Variables	*Direct effect*	*Indirect effect*	p-value	Hypothesis testing
H1	*PR -> EPS*	.866(.855)		<.001	Supported
H2	*PR -> EC*	.733 (.823)		<.001	Supported
H3	*PR -> EA*	.427(.451)		<.001	Supported
H4	*EPS -> EA*	.309(.331)		<.001	Supported
H5	*EC -> EA*	.281(.264)		.012	Supported
H6	*PR -> EPS -> EA*		.268	.005	Supported
H7	*PR -> EC -> EA*		.206	.014	Supported

Note 1: Model fit: x2= 181.304, df= 85, comparative fit index (CFI)= .961, Tucker-Lewis index (TLI)= .952, standardized root mean square residual (SRMR)= .040, root mean square error of approximation (RMSEA)= .066; ***p < .001; **p < .05. *Note 2*: Peer Relationship (PR); Exercise Participation Satisfaction (EPS); Exercise Commitment (EC); Exercise Adherence (EA).

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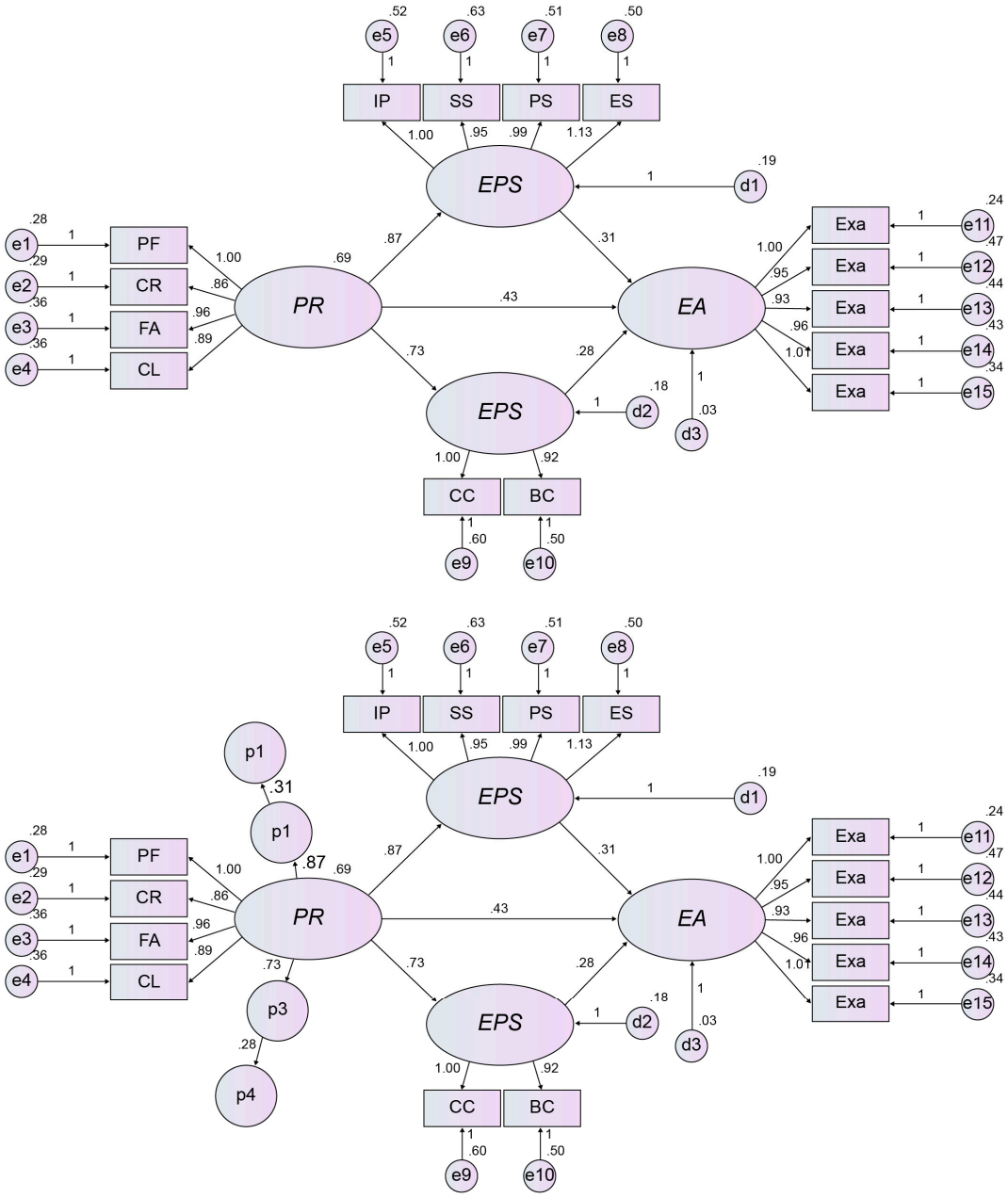

Figure 1. Results of the structural equation model analysis.

4. Discussion

In this study, we use a structural equation model to explore the direct effects of peer relationships, satisfaction with exercise participation, exercise commitment, and exercise adherence intention on participants in school sports clubs. Furthermore, we examine the mediating role of satisfaction with exercise participation and commitment in the relationship between peer relationships and exercise adherence intention.

Our findings reveal that peer relationships, exercise participation satisfaction, and exercise commitment positively influenced adherence intention among school sports club participants, confirming H3, H4 and H5. These results align with those of prior research, emphasizing the significance of these factors as determinants of adherence intention. Peer relationships, satisfaction with exercise participation, and commitment to exercise were found to be crucial psychological factors that foster regular and sustained participation in school sports club activities. Their impact on

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exercise adherence is further underscored in the current literature, which highlights the vital roles of these psychological factors. Positive experiences and emotions stemming from peer relationships, satisfaction, and commitment during exercise activities can directly enhance adherence.

The study findings also indicate that peer relationships positively influenced not only the exercise adherence of school sports club participants, but also their participation satisfaction and exercise commitment, confirming H1 and H2. This underscores the importance of emotional social support among these participants as a pivotal psychological factor that contributes to their satisfaction with exercise participation and commitment. These findings align with prior research in Korea that explored the interplay between these variables [28,29,32].

The impact of peer relationships on satisfaction and commitment to exercise participation can be attributed to the emotional dimension of satisfaction. As Rain et al. (1991) posit, satisfaction in relation to an individual's experiences can catalyze various positive outcomes. This suggests that satisfaction derived from school sports club activities and an individual's psychological state in diverse scenarios are interrelated, rather than isolated phenomena. Moreover, peer relationships can engender myriad emotions in school sports clubs. For instance, contentment with peers involved in physical activities becomes instrumental. Such emotions can serve as significant predictors of exercise participation, satisfaction, and commitment.

Furthermore, given the significant relationships established between peer relationships, exercise participation satisfaction, exercise commitment, and exercise adherence intention, both exercise participation satisfaction and commitment were expected to mediate the link between peer relationships and exercise adherence intention. However, this mediating effect was only evident for exercise commitment (H6 and H7). This suggests that while peer relationships can foster positive feelings, such as satisfaction with exercise participation and commitment, positive emotions subsequently amplify the intention to adhere to exercise. These findings highlight the role of peer relationships as potent psychological drivers of sustained involvement in school sports clubs. More than just directly influencing exercise adherence intention, peer relationships can enhance internal motivation through exercise commitment, leading to a sustained exercise routine.

In the Korean educational landscape, where college entrance examinations hold significant weight [3], teenagers often struggle to maintain a sometimes precarious balance between life and academic requirements. Physical activity is crucial in such environments. Specifically, school sports club activities stand out as a hallmark of physical engagement among Korean adolescents and play a crucial role in enhancing their overall quality of life [2].

The significance of factors such as peer relationships, satisfaction with exercise participation, and exercise commitment has not been previously understood within the overall framework of the lives of such adolescents. However, the findings of this study indicate that these are the key determinants in sustaining youth engagement in physical activities, particularly in school sports clubs. Fostering strong peer relationships can serve as an effective strategy to motivate students to remain active participants in school sports clubs.

It is also imperative to recognize the significance of peer relationships, satisfaction with exercise participation, and exercise commitment in guiding school sports club participants towards sustained exercise. Such recognition can prompt the development of meaningful intervention strategies that foster positive emotions centered on peer relationships. Peer relationships, often nurtured through close interactions and social support [57–59] can facilitate spontaneous and voluntary interactions among participants.

However, this study is limited in that it only focused on Korean adolescents and does not allow for ready generalization of its findings to other populations. Studies that consider more diverse demographics are needed to establish more objective and consistent findings. However, as this study only employed a cross-sectional design that captured participants at a specific moment, exploring these dynamics through a longitudinal design could offer further valuable insights into how peer relationships, participation satisfaction, commitment, and adherence intentions evolve over time.

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