





The relationship between social support and health-promoting lifestyle: Mediating role of health self-efficacy

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Abstract: *Objective:* Koreans have a lot of interest in improving their quality of life, happiness, self-care, and health. This study aims to verify the relationship between social support, health self-efficacy, and health-promoting lifestyle among participants engaged in physical activity. *Methods:* In 2022, a total of 179 participants who engaged in physical activity in Jeju Special Self-Governing Province were measured for social support, health self-efficacy, and health-promoting lifestyle. Data analysis was conducted using SPSS 24.0 and Amos 24.0 statistical programs. *Results:* Social support had a significant negative effect on health-promoting lifestyle, while it had a significant positive effect on health self-efficacy. Health self-efficacy had a significant positive effect on health-promoting lifestyle. Health self-efficacy was found to have significant indirect effect on social support and health-promoting lifestyle. *Conclusions:* The results of this study are expected to increase awareness among physical activity participants of the importance of health-promoting lifestyle, and these findings suggest that campaigns efforts will be necessary for Korea association of health promotion to communicate the importance of health-promoting lifestyle to the general public.

Keyword: social support, health self-efficacy, health-promoting lifestyle, physical activity

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INTRODUCTION

As life expectancy increases due to economic development and growth in medical technology, people are getting interested in healthy lifestyles [1]. The focus has shifted from individuals' lifespan to their quality of life. Reflecting this interest, the results of the 2020 Ministry of Culture, Sports and Tourism that the proportion of people participating in recreational sports was over 60%, accounting for more than half of the population [2]. The reasons for participation were reported as maintaining and enhancing health (44.6%) and leisure time use (25.8%). The purpose of this study is to confirm the causal relationship between social support for health promotion behavior and health self-efficacy.

Engaging in health-promoting lifestyle can improve one's overall well-being and self-fulfillment in life [3]. These behaviors have benefits such as preventing disease, improving quality of life, and reducing health care costs [4]. Therefore, it is crucial to regularly monitor one's health status through check-ups and medical examinations [5]. According to Alpar et al. [6] a health-promoting lifestyle involves a multidimensional pattern of self-directed emotions and behaviors aimed at personal health, self-realization, and achievement. Additionally, Nies [7] explains that healthy habits, such as maintaining a low-fat diet, engaging in regular physical activity, maintaining a healthy weight, avoiding smoking and stress, can help prevent many chronic illnesses. Although numerous scholars have emphasized the significance of health-promoting lifestyle, many people seem to have little knowledge of the appropriate health-promoting lifestyle. Jackson et al. [8] stated the necessity for researchers studying health to identify the factors that influence health-promoting lifestyle, such as regular exercise, healthy diet and sufficient rest. Therefore, this study focused on investigating social support and health self-efficacy as factors influencing health-promoting lifestyle.

Social support refers to the positive emotions and feelings that individuals acquire through interaction with others [9]. It acts as a factor that has a significant impact on the functioning and adaptation of individuals [10] and contributes to maintaining and enhancing health, along with physical and psychological well-being [11]. Moreover, receiving emotional support from parents, peers, leaders, and others can reduce stress and have a positive effect on physical and psychological health [11,12]. Lee et al. [13] reported the relationship between social support and health promotion behavior among 240 elderly people in their study. Baheiraei et al. [14] analyzed 1,350 women, while McDonald et al. [15] made efforts to verify the relationship between them among 63 diabetic patients. However, studies verifying the effects of emotional support from family and acquaintances among physical activity participants are insufficient. In our study, we adopted health self-efficacy as a mediator to assess the relationship between social support and health-promoting lifestyle among physical activity participants in terms of their health self-efficacy.

Social learning theory predicts and explains behavior with several key concepts, including incentives, outcome expectations, and self-efficacy beliefs [16]. Self-efficacy is relevant to health education. However, despite its potential to play a crucial role in initiating and maintaining behavior change, self-efficacy has received little attention in the field of health education [17]. Health self-efficacy has been shown to have significant correlations with health behaviors [18, 19], self-management [20], and other factors. A meta-analysis has demonstrated that changes in behavior-specific cognition, such as self-efficacy, can lead to an increase in health-related intentions and behaviors [21]. Self-efficacy can significantly influence an individual's decisions and subsequent actions related to health improvement [22]. In this study, we hypothesize that health self-efficacy will play a crucial role as a mediator in the relationship between social support and health-promoting lifestyle.

In sum, individuals who receive emotional support can actively participate in positive and physical activities in their lives [23]. Participating in physical activities can

result if exercise dependency [24] and alcohol consumption [25,26], which can harm one's health. Therefore, our study aims to highlight the importance of health-promoting behavior through health self-efficacy as a mediator. In some cases, although some people believe their physical habits and diet are healthy, they have poor eating habits that lead to worsening health. Our study designs a research model to raise awareness of proper health self-efficacy and health-promoting lifestyle among participants who engage in physical activities.

The purpose of this study is to evaluate the mediating effect of health self-efficacy in the relationship between social support and health-promoting lifestyle. If the study is to verify the relationships among the variables, it is expected to provide fundamental data that might be used by organizations such as the Korea Association of Health Promotion (MEDI CHECK) and health centers to promote the significance of physical activity. The research hypotheses are as follows:

- social support will have a positive effect on health-promoting lifestyle.
- social support will have a positive effect on health self-efficacy.
- health self-efficacy will have a positive effect on health-promoting lifestyle.
- social support will have a positive indirect effect on health-promoting lifestyle through health self-efficacy.

MATERIAL AND METHODS

Participant

The study included 179 who participated in physical activity in the Jeju Special Self-Governing Province region of South Korea in 2022. Participants were selected using a purposive sampling method, which is a non-probability sampling technique. Of the study participants, 85 (47.5%) were male and 94 (52.5%) were female. The age distribution was as follows: 64 (35.8%) were in their 20s, 88 (49.2%) were in their 30s, 17 (9.5%) were in their 40s, 5 (2.8%) were in their 50s, and 5 (2.8%) were in their 60s. In total, 179 were selected as study subjects based on these criteria. The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Jeju National University Institutional Review Board (JJNU-IRB-2022-081).

Procedure

To measure social support, we used the scale developed by Zimet et al. [27], the Multidimensional Scale of Perceived Social Support (MSPSS), which consists of 12 items rated on a scale of 1 (strongly disagree) to 5 (strongly agree). We used the scale developed by Lee et al. [28] to measure health self-efficacy. This scale consists of 24 items rated on a scale of 1 (strongly disagree) to 5 (strongly agree) and is composed of six factors. We used the scale developed by Frank-Stromborg et al. [29] to measure health-promoting lifestyle. This scale consists of 25 items rated on a scale of 1 (strongly disagree) to 4 (strongly agree) and is composed of five factors. All scales were used in Korean after being translated from English. Two doctoral students and one postdoctoral researcher from the university where the corresponding author is affiliated participated in the translation. They were proficient in both Korean and English. The overall reliability of all scales was found to be satisfactory, as shown in Table 1.

Method of Analysis

The collected data were analyzed using SPSS 24.0 and Amos 24.0 statistical programs in accordance with the study's objectives. Firstly, frequency analysis was performed. Secondly, the reliability of each measurement tool was validated by calculating Cronbach's α values. Thirdly, Pearson product-moment correlation coefficients were calculated. Lastly, a test was conducted to verify the mediating effect of health self-efficacy in the relationship between social support and health-promoting behavior. In order to construct variables for social support, three parcels (parcel: a suite of questions) were

developed for each latent variable using the methods proposed by Russell et al. [30]. The factor loadings of the questions were then arranged in a high-to-low order by adding questions with the highest and lowest factor loadings. The questions were allocated to three parcels, ensuring that the average of the factor loadings for each parcel was equal.

RESULTS

Result of Statistical and Correlation Analyses

Table 1 contains the calculated averages, standard deviations, skewness, kurtosis, and correlation coefficients of the variables. The data exhibited normal distribution as the skewness and kurtosis values fell within the recommended ranges of -2 to +2 and -7 to +7, respectively [31]. Correlations were conducted to examine the overall relationships between variables, and all variables were found to be correlated below 0.65 (see Table 2).

Analysis of the Measurement Model

To verify whether the measurement variables of the model established in this study adequately measure the corresponding latent variables, a measurement model was tested. The analysis results showed that the fit of the measurement model was appropriate ($\chi^2= 189.125$, $df= 73$, $p<0.001$, $Q= 2.591$, $IFI= 0.888$, $TLI= 0.858$, $CFI= 0.886$, $RMSEA= 0.095$). The factor loadings of the 14 measurement variables on their respective latent variable were all significant at the $p<0.001$ level (Figure 1).

Table 1. Descriptive statistics of selected variables.

Variable	Mean	SD	Skewness	Kurtosis	Cronbach's α
Social support	4.31	0.71	-0.92	0.11	0.84
Exercise	3.85	1.04	-0.66	-0.49	0.92
Illness	3.86	0.81	-0.59	0.43	0.65
Emotion	3.82	0.77	-0.13	-0.57	0.74
Nutrition	3.12	1.03	-0.02	-0.71	0.83
Stress	3.84	0.85	-0.28	-0.55	0.82
Health practice	4.1	0.68	-0.67	0.71	0.56
Health responsibility	2.87	0.68	-0.01	-0.55	0.74
Exercise	2.61	0.73	-0.19	-0.42	0.73
Diet behavior	2.51	0.65	0.15	-0.29	0.82
Stress management	2.82	0.63	0.12	-0.28	0.77
Smoking behavior	3.33	0.7	-0.85	0.12	0.85

SD: standard deviation

Table 2. Correlation table between measurement variables.

Variable	A	B	C	D	E	F	G	H	I	J	K
Exercise (B)	0.28**										
Illness (C)	0.23**	0.40**									
Emotion (D)	0.41**	0.49**	0.35**								
Nutrition (E)	0.20**	0.36**	0.38**	0.26**							
Stress (F)	0.59**	0.25**	0.38**	0.44**	0.37**						
Health practice (G)	0.32**	0.45**	0.40**	0.30**	0.39**	0.49**					
Health responsibility (H)	0.20**	0.38**	0.46**	0.28**	0.58**	0.37**	0.49**				
Exercise (I)	0.20**	0.65**	0.28**	0.37**	0.41**	0.48**	0.37**	0.41**			
Diet behavior (J)	0.18**	0.51**	0.33**	0.37**	0.54**	0.38**	0.48**	0.53**	0.53**		
Stress management (K)	0.40**	0.50**	0.34**	0.53**	0.36**	0.38**	0.38**	0.42**	0.50**	0.51**	
Smoking behavior (L)	0.19**	0.10	0.40**	0.12	0.26**	0.27**	0.27**	0.37**	0.15*	0.19**	0.20**

A: Social support, B: Exercise, C: Illness, D: Emotion, E: Nutrition, F: Stress, G: Health practice, H: Health responsibility, I: Exercise, J: Diet behavior, K: Stress management, L: Smoking behavior; * $p<0.05$, ** $p<0.01$

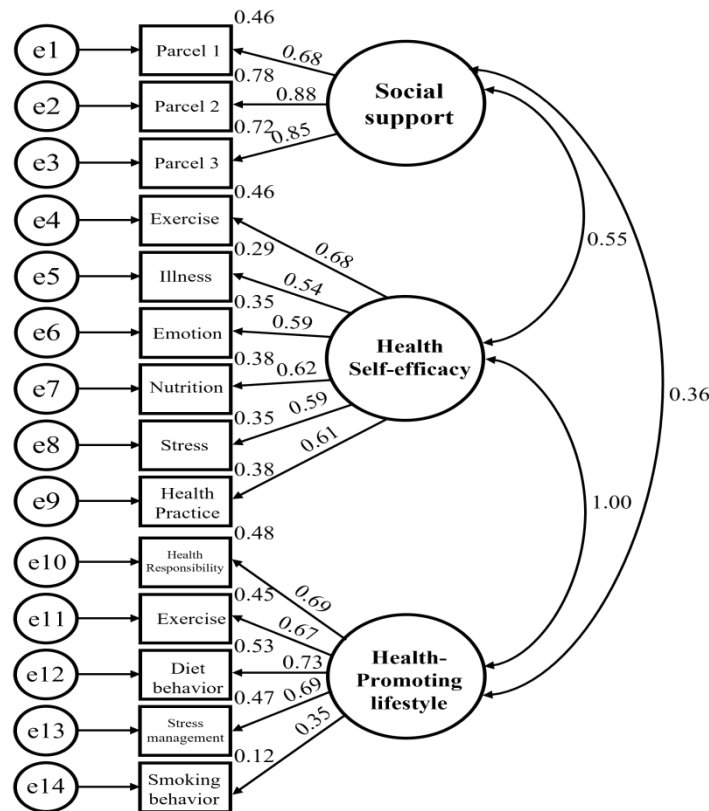


Figure 1. Analysis of measurement model among variables.

Validation of Structural Model

A structural model was validated to investigate the mediating effect of health self-efficacy in the relationship between social support and health-promoting lifestyle (table 3). Following the mediating effect validation procedure proposed by Holmbeck [32], the analysis was conducted. Social support had a significant positive effect ($\beta = 0.361$, $p < 0.001$) on health-promoting lifestyle. Therefore, the direct effect model was found to be excellent ($\chi^2 = 38.273$, $df = 19$, $p < 0.01$, $Q = 2.014$, $IFI = 0.960$, $TLI = 0.940$, $CFI = 0.959$, $RMSEA = 0.075$). Next, we included the mediating variable, health self-efficacy, in the model and validated the partial mediating model (Figure 2). The validation result showed that the partial mediating model was somewhat high in RMSEA value, but overall it was found to be suitable for the data ($\chi^2 = 219.499$, $df = 74$, $p < 0.001$, $Q = 2.966$, $IFI = 0.859$, $TLI = 0.824$, $CFI = 0.857$, $RMSEA = 0.105$). The path coefficients of the model were significant at the $p < 0.01$ level.

We validated the full mediating model by removing the direct path from social support to health-promotion behavior. Although the RMSEA value was slightly high, overall satisfactory results were obtained ($\chi^2 = 230.329$, $df = 75$, $p < 0.001$, $Q = 3.071$, $IFI = 0.850$, $TLI = 0.815$, $CFI = 0.847$, $RMSEA = 0.108$). There was a significant difference between the full mediating model and the partial mediating model ($\Delta\chi^2 = 10.83$, $df = 1$, $p < 0.05$). In this study, the explanatory power of the partial mediating model with the direct path was found to be more meaningful than that of the full mediating model. Therefore, we adopted the partial mediating model as the final model, as shown in (Figure 2). As shown in (Figure 2), social support had a significant negative (-) effect on health-promotion behavior. Social support had a significant positive (+) effect on health-promotion behavior efficacy. Health self-efficacy had a significant positive (+) effect on health-promotion behavior. The bootstrapping analysis showed that the indirect effect was significant at the .05 significance level because the value of 0.302 fell outside the confidence interval of 0.140 to 0.440, which did not include 0.

Table 3. Estimated value of path coefficient of measurement model.

Route	Estimate	SE	CR	p	SRW
Health self-efficacy ← Social support	0.44	0.08	5.79	0.001	0.55
Health behavior ← Health self-efficacy	0.78	0.10	7.50	0.001	1.15
Health behavior ← Social support	-0.15	0.05	-3.11	0.002	-0.27
Social support 1 ← Social support	1.00				0.85
Social support 2 ← Social support	0.79	0.07	11.96	0.001	0.88
Social support 3 ← Social support	0.60	0.06	9.55	0.001	0.68
Exercise ← Health self-efficacy	1.00				0.68
Illness ← Health self-efficacy	0.62	0.09	6.68	0.001	0.54
Emotion ← Health self-efficacy	0.64	0.09	7.23	0.001	0.59
Nutrition ← Health self-efficacy	0.91	0.12	7.56	0.001	0.62
Stress ← Health self-efficacy	0.71	0.09	7.24	0.001	0.59
Health practice ← Health self-efficacy	0.60	0.08	7.52	0.001	0.62
Health responsibility ← Health behavior	1.00				0.69
Exercise ← Health behavior	1.03	0.13	8.09	0.001	0.67
Diet behavior ← Health behavior	1.01	0.12	8.79	0.001	0.73
Stress management ← Health behavior	0.91	0.11	8.32	0.001	0.69
Smoking behavior ← Health behavior	0.51	0.12	4.33	0.001	0.35

SE: standard error; CR: critical ratio; SRW: standardized regression weights

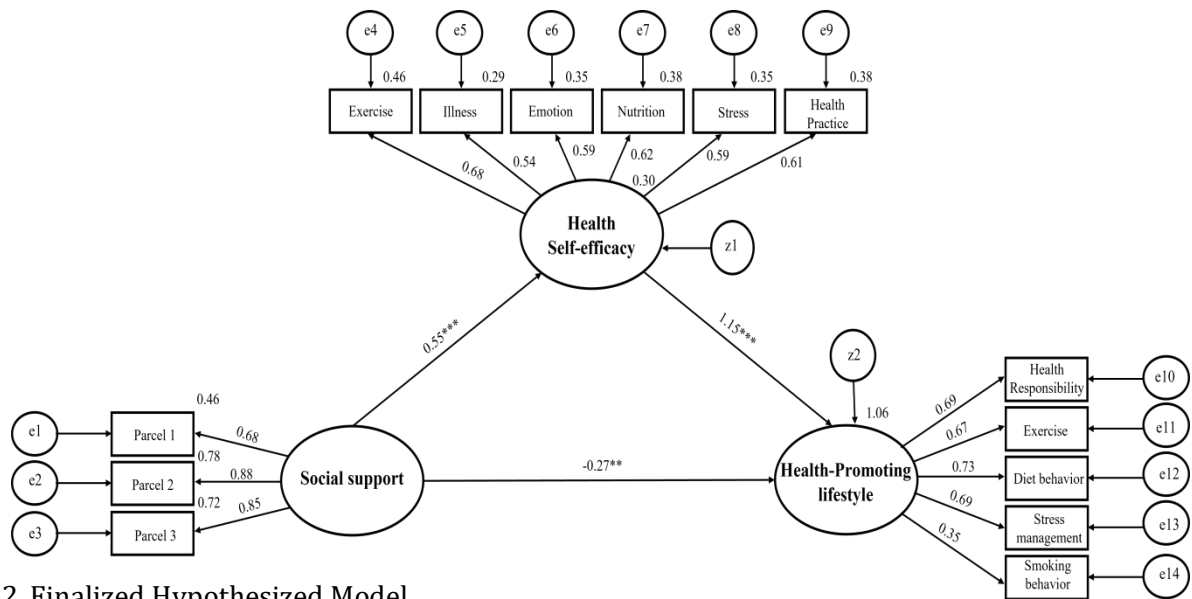


Figure 2. Finalized Hypothesized Model.

DISCUSSION

The World Health Organization (WHO) points out that more than 53% of global deaths are caused by incorrect health behavior [33]. Some chronic diseases are known to be behavior-related illnesses. For example, the occurrence of high blood pressure is closely related to healthy lifestyle habits [34]. Unhealthy lifestyle habits, increases in physical disabilities, caregiver shortages, low-income, and depressive symptoms are likely to be precursors that harm health [35]. In our study, we aim to propose ways to establish and maintain healthy lifestyle habits. To summarize the results of this study, it was found that perceiving social support among physical activity participants enhances health

promotion behavior through health self-efficacy. However, while social support had a positive effect on health-promotion behavior in the first step proposed by Holmbeck [32], it was found to have a negative effect in the partial mediation effect test. Overall, social support was found to have a significant indirect effect on health promotion behavior through mediating health self-efficacy. Specifically, the discussion is based on the partial mediation model.

Social support had a significant negative effect on health promotion behavior. These results contradict those of Mo et al. [36], which analyzed older adults (n=200) and young adults (n=208) and found that social support had a positive effect on health-promotion behavior in both groups. It was suggested that engaging in regular exercise, healthy eating habits, getting enough sleep, and managing stress through social support from family and friends can enhance health promotion behavior. In addition, emotional support - which often comes from a spouse, family member, or close confidante and encompasses love and affection - can make an individual feel loved and motivated to engage in health-promotion behavior [37]. The opposite results were extracted from this study. The results of this study indirectly support the findings of Jackson et al. [38], who analyzed 162 college students and found that social support did not have a significant effect on health-promoting lifestyle. In particular, they explained that the level of social support from family and friends decreased as age increased. The authors of this study argue that the relationship between social support and health-promoting lifestyle needs to be discussed specifically in future research, depending on age and regional characteristics.

Social support has been shown to have a positive effect on healthy self-efficacy. These results support the findings of Anderson et al. [39] study, which examined 999 participants in a health promotion study and found that social support had a positive effect on self-efficacy, and Liu et al. [40] study, which examined 444 Chinese nurses and found that social support had a positive effect on self-efficacy. Anderson et al. [38] indirectly supported the findings of this study by showing that high levels of social support and self-efficacy have a positive effect on life satisfaction. When individuals receive support from others, they may feel more confident in their ability to take care of their own health, and may be more likely to engage in health-promoting lifestyle such as exercise, healthy eating, and seeking medical care when needed [38]. Additionally, social support can provide encouragement and motivation to individuals, helping them to overcome challenges and persevere in their health goals. This emphasizes the need to actively pursue social support.

Healthy self-efficacy has been shown to have a positive effect on health-promoting lifestyle. These results support the findings of Choo et al. [41] study, which examined 75 abdominally obese women and found that dietary habits and healthy self-efficacy have a significant positive effect on health promotion behavior. Furthermore, Park et al. [42] study, which examined 204 single Korean women, found that the interaction between self-efficacy and social support in the relationship between depression symptoms and health behavior had a significant effect on health behavior in order of high, medium, and low. In addition, Mohamad et al. [43] study, which examined 218 elderly people, revealed a close relationship between self-efficacy and elderly health-promoting lifestyle. Experts emphasize the need to develop and implement health programs to increase the value of health for enhancing health self-efficacy [8]. Also, they can offer seminars that address self-management strategies for engaging in health behaviors that reduce the risk of cancer, diabetes, arthritis, obesity, hypertension, unplanned pregnancy, and substance addiction [8]. Altering perceived social norms about health behaviors is an established way to change the valence of health [44,45]. Based on previous studies, efforts should be made at the community level to promote awareness of health-promoting lifestyle.

The relationship between social support and health-promotion lifestyle has shown that health self-efficacy has a significant mediating effect. This result is supported by Choi [46] study, which found that informational social support has a significant mediating effect on health self-efficacy in the relationship between health-promoting lifestyle among 186

elderly participants. Individuals with high self-efficacy perceive a challenging spirit to overcome stress factors [47]. Moreover, it is suggested that social support from friends/family in daily life is important to improve self-efficacy, as it has a positive effect on life satisfaction and well-being [48]. This research contains information regarding self-efficacy, which serves as an indicator of intention and activity across all areas of health. Individuals with high levels of self-efficacy demonstrate greater execution and motivation, and are more likely to choose effective strategies [49]. Our research team suggests that media platforms such as YouTube and Instagram, which are easily accessible to the public, can be utilized as foundational materials to raise awareness of the importance of health, promote health awareness, proper dietary habits, and smoking cessation, with the goal of enhancing the public's health self-efficacy. In other words, our study's findings emphasize the importance of promoting health self-efficacy and proper health awareness.

In summary, social support perceived by physical activity participants was found to have no significant effect on health-promoting lifestyle, but the influence of health self-efficacy on health promotion behavior was positive. Our study suggests that individuals who have the ability to control their own unhealthy habits such as poor dietary habits, intense exercise, smoking, and alcohol consumption in daily life can improve their health promotion behavior through health self-efficacy. To achieve this, efforts should be made to enhance health awareness in schools and Korea Association of Health Promotion (MEDI CHECK).

CONCLUSION

This study extracted the positive mediating effect of health self-efficacy in the relationship between social support and health-promoting lifestyle through structural equation modeling analysis of 179 participants engaged in physical activity. Despite the meaningful results, the study acknowledges its limitations. Firstly, the participants were limited to a specific region of physical activity participants, which limits generalizability to all physical activity participants. Future research efforts should validate whether these results can be replicated among physical activity participants from other regions in Korea. Secondly, in the verification of partial mediating effects, social support was found to have a negative effect on health-promoting lifestyle (which is contrary to previous studies). Future research needs to conduct difference verification based on gender, age, and regional characteristics to confirm causality among variables. Thirdly, it is necessary to verify causality among variables based on the level of exercise participation (high, middle, low) per week using the Godin et al., [50] measurement tool. Health professionals emphasize the importance of promoting health behavior among adolescents in local communities to improve health promotion and welfare [51], suggesting a need for future research on this population. Ultimately, this study's results are expected to contribute to research on physical activity and health management in the fields of public health science and sports science.

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Conflicts of Interest: The authors declare that they have no conflict of interest. Each of the authors has read and concurs with the content in the final manuscript. This study did not receive financial support. All authors read and approved the final version of the manuscript.

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