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Research Article

Students' Academic Buoyancy Prediction based on Health Literacy and Performance of School Health Nurses

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Abstract

Background: Schools have an important role to play in helping students achieve buoyancy (AB) and healthy learning. The main purpose of this study is to predict students' academic buoyancy based on the health literacy (HL) of school health nurses (SHN) and their performance in health promoting high schools.
Methods: This descriptive correlational study consisted of the SHN of all health promotion secondary schools of East Azarbaijan province educational districts. The statistical population of the study includes 260 SHN in schools in the 2019-2020 academic year. For sampling, 160 SHN and 320 students were selected using stratified random sampling. For data collection, we used the HL Questionnaire of the Institute of Health Sciences, the SHN Performance Questionnaire of Vaparzeh and colleagues and the AB Questionnaire of Hosseinchari and Dehghanizadeh.
Results: Estimation of the descriptive statistics and the correlation of variables based on SPSS software showed that the means of HL (141.41±18.49), performance (95.45±12.89), and AB (52.3±6.81) were higher than average. There was a significant correlation between HL, performance, and AB. The results of structural equation modeling with PLS software demonstrated that the performance of SHN and its dimensions could be predicted based on HL (P<0.001), But students' AB is not predictable based on HL (P=0.054) and the performance of SHNs (P=0.63) or mediated by their performance (P=0.09).
Conclusion: Health literacy promotion programs for teachers and school nurses can ensure the success of schools in improving student health.

Keywords: Health literacy, Health promotion, Delivery of Health Care, Schools, Academic buoyancy

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1. Introduction

Schools can help promote a healthy lifestyle (1, 2). Promotion of health in schools, which is increasingly being supported (3), dates back to the Ottawa Declaration at the first International Conference on Health Promotion, held in 1986 (4). The statement stressed the need to provide a safe learning environment for students and school staff, and make the school a place for health promotion and the related executive actions (5).

In general, the sense of vitality is a significant indicator of mental health (6). Academic buoyancy (AB) refers to a positive, useful, constructive, and flexible response to all the education barriers (7); it is considered as one of the important variables of academic health (8) which helps students overcome the stress (9) caused by the life and education problems and challenges (10). In fact, buoyancy is significantly effective in the students' ability to cope with their academic problems (7); it decreases the probability of their failure (11) and is highly correlated with adaptive behaviors in school. Given the role of buoyancy in coping with the challenges, having a sense of control, and academic achievement (12), it should be paid a special attention.

As the main members of the health promotion team, health care nurses in schools play the most important role in the promotion of the students' health and buoyancy and providing the at-risk children and their families with health services (13). The school staff leads classrooms to provide high-quality services (14), and they are responsible for enhancing the school performance based on the society's needs. Accordingly, performance evaluation and its relationship with the students' academic characteristics are increasingly considered as potential determinative factors (15).

Therefore, it is highly important to recognize the factors determining AB. These factors have been studied in three levels of individual, family and peers, and school (academic engagement) factors. One of

the most important variables of AB is the SHN and teachers' health literacy (HL) (13).

HL is a new concept based on the notion that health and literacy are vital resources of daily life, and they are considered as a dynamic factor in health promotion (16). Sorensen and colleagues. Described the dimensions of HL as knowledge, motivation, competency, understanding, evaluation, and using the health-related information in health care services, prevention of the diseases, and health promotion (17). Gribel and colleagues. Recently proposed a definition of HL that included the aspects of interaction, dynamic transformation, changing the information seeking patterns, and integration of the technological dimensions (18).

The performance of schools and their staff is also an effective factor in the AB of students and the school climate has an effective role in this regard (19). The school staff's performance is also an effective factor in the students' AB and the school atmosphere plays an effective role in this relationship (20). Researchers have proven the effect of school atmosphere on the students' academic enthusiasm in high schools. Also, the students' perception of the school atmosphere is effective in their academic enthusiasm and health (21).

According to the literature review, school health nurses' performance (SHNP) in health promoting schools and its relationship with HL have not been given enough attention and the students' AB has not been investigated in terms of HL and the mediating role of SHNP. Therefore, this research aimed to propose a structural analysis of the effects of HL on the students' AB through considering the mediating role of SHNP in these schools.

According to the theoretical and research bases, the conceptual model of the research can be drawn as follows (Figure 1).

2. Methods

2.1 Study Design

This research was a correlation study based on structural equation modeling (SEM).

2.2 Selection and Description of Participants

The population includes all the SHN in the high schools of East Azerbaijan Province (260 high schools including 150 all-girl schools and 110 all-boy schools) during the academic year 2019-2020 and all the SHN working in these schools (260 people). The sample size was 160 schools based on Morgan and Krejcie sample selection table; thus, 160 SHN were selected as the samples. In addition, two students were selected for every SHN. The samples were selected by stratified random sampling based on the educational district and the student's gender.

2.3 Technical Information

The variables were measured by the following questionnaires:

SHNP Evaluation Questionnaire

The SHNP was assessed by a questionnaire designed by Vaprezeh and colleagues (22). The content and construct validity of this questionnaire was checked in 2020. This scale evaluates the managers' viewpoint on the performance of SHN from two aspects (22). Its dimensions include the healthcare performance (items 1-11), food distribution, and nutrition control (items 12-22). Answers are graded from 1 to 5 based on a Likert scale. Number 1 indicates the lowest level of the measured trait and number 5 indicates the highest level. Vaparezeh and colleagues obtained the reliability of this questionnaire to be 0.95 for the healthcare dimension and 0.96 for the nutrition control dimension (22). In this study, Cronbach's alpha was calculated 0.81 for the total questionnaire, 0.89 for the healthcare dimension, and 0.93 for the control dimension; the values of composite reliability were calculated to be 0.91, 0.91, and 0.94, respectively.

HL Questionnaire

In this research, HL was evaluated by health literacy for Iranian adults (HELIA) (2014) designed by Academic Jihad Science and Health Research Institute (23). This questionnaire evaluates HL in five dimensions, namely reading, access, understanding, assessment, decision-making, and behavior. Answers are graded based on a five-point Likert scale, where 1 indicates the lowest

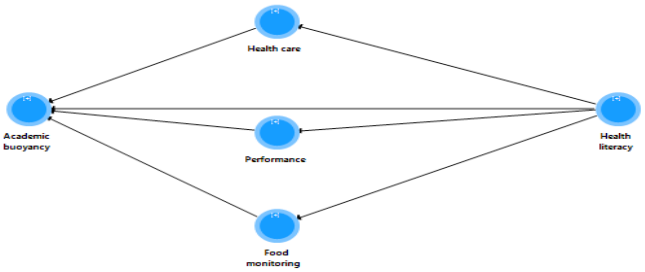

Figure 1: Conceptual model of research

level of the measured trait and 5 shows the highest level. Montazeri and colleagues obtained the total reliability of this questionnaire to be above 0.72, and they approved its construct validity (23). In the present study, Cronbach's alpha coefficient of this questionnaire was calculated 0.94 and its composite reliability was calculated 0.95 by PLS software.

AB Questionnaire

In 2012, Dehghanizadeh and Hosseinchari (24) designed the AB questionnaire which included nine items. The validation results of the questionnaire suggested the acceptable internal consistency of the items (0.73). In the present research, based on confirmatory factor analysis, the Cronbahc's alpha coefficient was obtained to be 0.78 and the composite reliability of the questionnaire was 0.84 in PLS software.

All of the three questionnaires were scored based on a five-point Likert scale. The number of items multiplied by the average score of each item (3) indicates the medium level; the number multiplied by 4 indicates a higher than medium level, 5 indicates a top level, by 2 indicates a lower than medium level, and 1 indicates the poor level of the variable.

2.4 Statistical Analysis

SPSS software was used to calculate the descriptive indices and measure the correlation of variables. Hypothesis statistical analyses was done with SEM method and partial least squares (PLS) software. Therefore, the conceptual model and the hypothesis were tested by Smart-PLS3 software. Ethical considerations, including the samples' informed consent and information privacy, were observed.

3. Results

In terms of education level, 72 subjects had a master's degree (45%), and 88 had a bachelor's degree (55%). Regarding the working background, 28 participants had a work experience of less than 10 years (17.5%), 24 had a record of 10-15 years (15%), 64 had 15-20 years of working experience (40%), and 44 had worked for more than 20 years (27.5%). Concerning work experience as an SHN, 77 a working record of less than 10 years (48.1%), 69 participants had a work experience of 10-15 years (43.1%), and 14 subjects had 15-20 years of experience (8.8%). According to Table 1, the SHN's HL was higher than the average (141.41±18.49), and the students' AB (30.52±6.81) and the SHNP (95.45±12.89) were also higher than average. Moreover, all the dimensions of SHNP, including healthcare and nutrition control, were reported to be higher than average. The dimensions of HL, including reading, access, understanding, assessment, decision-making, and SHN behavior were also higher than average.

The results of Pearson correlation test with SPSS software revealed a significant correlation among health literacy, school health nurse's performance and its dimensions and students' academic buoyancy.

According to Table 2, there was a significant correlation between health literacy and the performance of school nurses and the dimensions of these two variables with students' academic buoyancy. A significant correlation also existed among health literacy, the total performance of school nurses, the performance of school nurses in the field of health care, and the monitoring of food components ($P<0.01$).

Table 3 shows the structural model fit indices. According to this table, the reliability value of all variables was above 0.7 with a high validity. The calculated coefficient of determination was above 0.67. The goodness of fit (GOF) of the model was above 0.25. Accordingly, the model had a good fit in explaining the academic buoyancy.

Table 1: Descriptive statistics of academic buoyancy, health literacy and performance

Variable		Mean±SD
Academic buoyancy		30.52±6.81
Performance	Total performance	95.45±12.89
	Performance of health care	47.31±6.21
	Food monitoring	48.14± 7.8
Health Literacy	Total health literacy	141.41±18.49
	Read	17.95±2.28
	Access	25.84±3.3
	Understand	29.05±4.51
	Assessment	17.51±2.06
	Decision making ,behavior	51.83± 6.96

Table 2: Correlation of academic buoyancy, health literacy and performance

Variables	1	2	3	4	5	6	7	8	9	10
Academic buoyancy	1	0.84**	0.82**	0.73**	0.59**	0.77**	0.82**	0.80**	0.79**	0.73**
Health Literacy	0.84**	1	0.95**	0.88**	0.71**	0.88**	0.94**	0.95**	0.90**	0.86**
Performance	0.82**	0.95**	1	0.87**	0.69**	0.82**	0.92**	0.95**	0.89**	0.93**
Access	0.73**	0.88**	0.87**	1	0.66**	0.78**	0.86**	0.92**	0.85**	0.76**
Read	0.59**	0.71**	0.69**	0.66**	1	0.58**	0.69**	0.70**	0.70**	0.59**
Understand	0.77**	0.88**	0.82**	0.78**	0.58**	1	0.83**	0.81**	0.79**	0.73**
Assessment	0.82**	0.94**	0.92**	0.86**	0.69**	0.83**	1	0.91**	0.89**	0.81**
Decision-making	0.80**	0.95**	0.95**	0.92**	0.70**	0.81**	0.91**	1	0.87**	0.88**
Performance of health care	0.79**	0.90**	0.89**	0.85**	0.70**	0.79**	0.89**	0.87**	1	0.68**
Food monitoring	0.73**	0.86**	0.93**	0.76**	0.59**	0.73**	0.81**	0.88**	0.68**	1

**Correlation is significant at the 0.01 level (2-tailed)

Table 3: Results of partial least squares regression in academic buoyancy prediction and model fit

Model fit	Variable / Report	Health Literacy	Performance	Performance of health care	Food monitoring
Measurement	Cronbach's Alpha	0.94	0.81	0.89	0.93
	Path Coefficient	0.32	0.51	0.06	0.05
Structural	R square adjusted	0.71			
Total	GOF	0.34			

*GOF: good of fitness

The results of SEM test with PLS software showed:

1) School health nurses' performance and its dimensions could be predicted based on their health literacy.

2) Students' academic buoyancy cannot be predicted based on health literacy and school health nurses' performance and its dimensions.

3) Students' academic buoyancy cannot be predicted based on the school health nurses' health literacy and the mediating role of their performance.

As seen in Figure 2, the factor loadings of all the items relative to their constructs were higher than 0.4, indicating the validity of the items for measuring the variables. Accordingly, all the items were valid and none were removed. The standard path coefficients indicated the direct effect of HL on performance and its dimensions, the path coefficient of HL to the total performance (0.95), the relationship between HL and SHNP (0.9), and the relationship between HL and food control performance (0.85); all the three paths were significant at P<0.001. Regarding the significance level of P=0.054, there was no significant relationship between HL and AB, the total performance and AB (P=0.63), the healthcare performance dimensions with AB (P=0.92) and the food monitoring performance dimension with AB (P=0.93). Accordingly, there was a significant direct correlation between the HL variables and performance and its dimensions. The standard coefficients and their significance levels indicated the relationship between the predictor variable and the dependent variable. The significance values indicated the acceptable error in rejecting the null hypothesis. Therefore, it can be stated that the predictor variables of HL and its dimensions were significantly effective in SHNP and its dimensions at P=0.09 (Figure 3).

According to this figure, in predicting the SHNP and its dimensions based on HL, the coefficient of determination was 0.9 for the total performance, 0.81 for healthcare, and 0.72 for food control. Based on the mentioned values, it can be stated that HL can highly predict the SHNP and its dimensions.

4. Discussion

According to the results, the SHNP in health promoting schools was predictable based on HL variable whereas AB could not be explained based on HL or SHNP. The results of the research are consistent with the findings reported by Khodabandeh and colleagues (25) and Haverinen and colleagues (26). In addition, the results suggested that the students' AB could not be predicted based on HL and SHNP, which is contradictory to the findings reported by Bohnenkamp

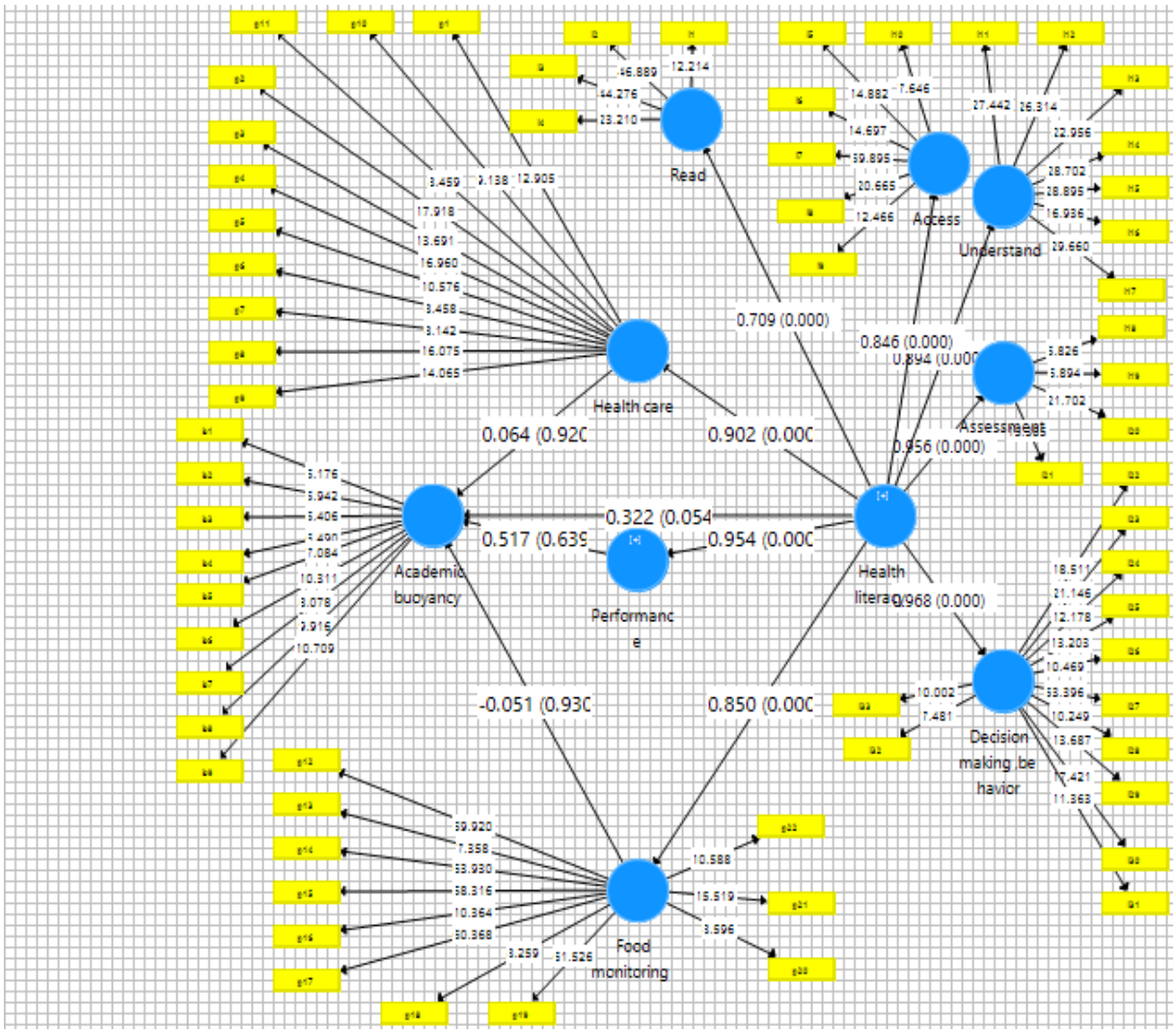

Figure 2: The standard coefficients and significance level of prediction of the students' academic buoyancy based on school health nurses' health literacy and the mediating role of their performance

and colleagues (27); this suggests the role of SHN in students' mental health and the findings reported by Kim and colleagues (28).

To explain these results, it can be stated that the concept of HL is beyond the individuals' abilities and considered as a social determinant of health (29). In addition, HL is a social and cognitive skill, and the improvement in HL is significantly effective in increasing the ability to make rational decisions, promoting security, increasing the self-care quality, reducing the health-threatening risks and health costs (30), and promoting health. SHNs are the main pillars of students' health care and health promotion in schools, and their high health literacy makes health indicators more highlighted and the health standards more observed. Therefore, health literacy can be a key predictor of the performance of SHNs both in the field of healthcare and in controlling and monitoring the food hygiene.

Based on the results, the students' AB could not be predicted based on HL and SHNP. To explain this finding, it can be stated that HL and SHNP cannot be directly effective in AB, rather they are effective in the success of health programs in schools (31). Meanwhile, different student-related variables may affect the quality of the relationship between these two variables. Factors such as school atmosphere, organizational support for SHN, school managers' management style, the organizational culture in the school, and the students' individual and family characteristics can all influence the relationship between these two variables. AB is one of the individual variables of students that is more impacted by the social atmosphere of the school and is a function of social interactions and human interactions in such environments. In this regard, teachers who are in direct and continuous contact with students can influence them more than SHNs; accordingly, neither the health literacy nor the performance of SHNs can

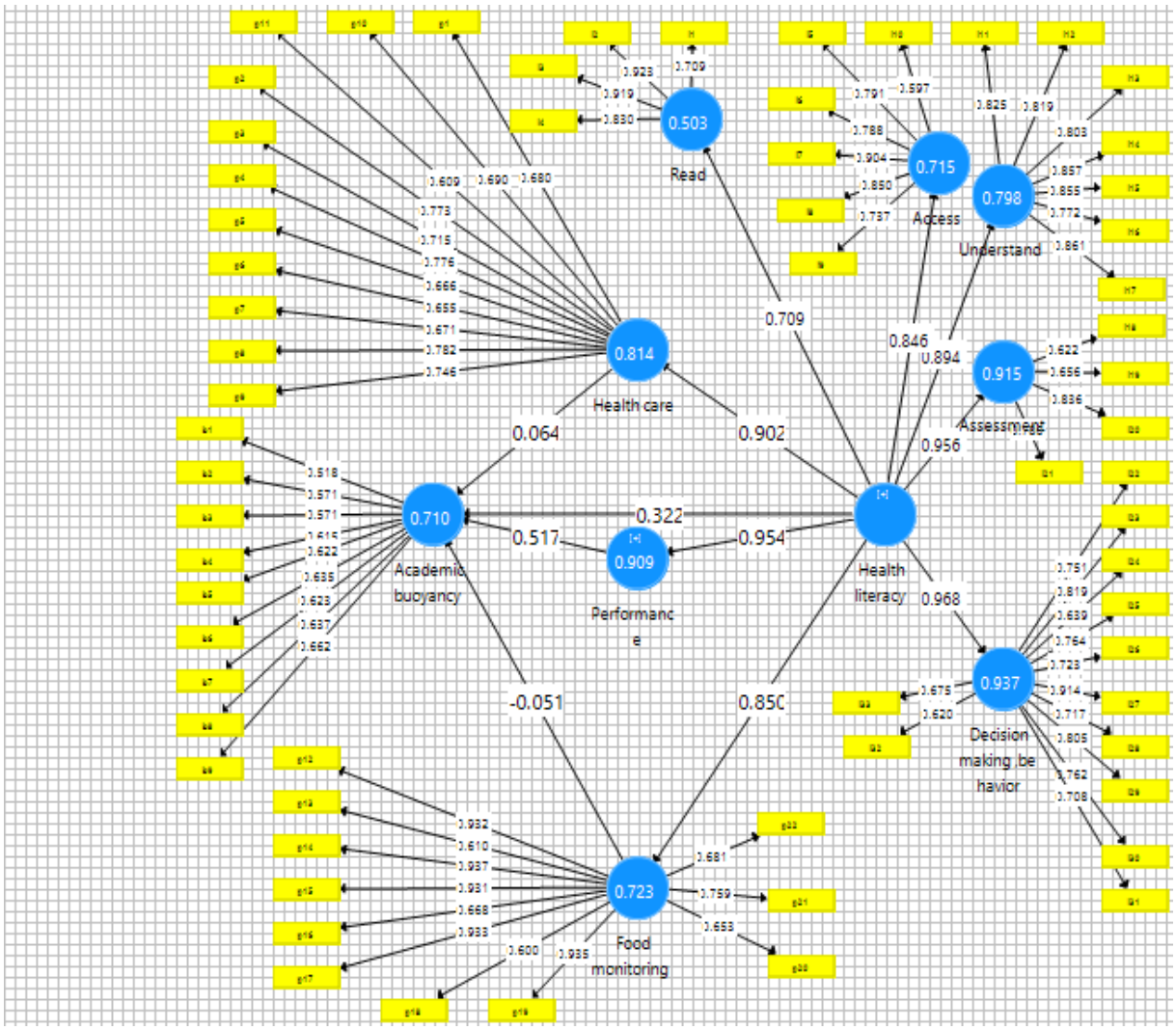

Figure 3: The standard coefficients and the coefficient of determination in prediction of the students' academic buoyancy based on the school health nurses' health literacy and the mediating role of their performance

play a significant role in students' AB.

Owing to its major effect on health-related decision-making, HL has been regarded as a global issue, and in this regard, the importance of teachers' HL should be underscored by educational policy makers (32).

5. Conclusion

World Health Organization has introduced HL as one of the major health determinants and has recommended all countries to form an association for controlling the strategic activities to promote HL in different communities; the key to the success of these programs is dynamism (33). The development of such associations requires matching the organization's perspectives with organizational HL and prioritizing it (34). Therefore, in order to be successful, school managers and SHN should remove the obstacles to health education in schools and develop a home-school relationship. By promoting the SHN health, HL has enhanced their performance in the process. It seems that the promotion of SHNs' HL has increased their capability in their job, hence their efficiency.

Based on the research findings, it is proposed that coherent programs be developed to promote the SHNs' HL, and investigate the role of individual and organizational variables in predicting the students' AB.

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Ethical Approval

The ethics review board of Sport Science Research

Institute approved the present study with the following number: IR.SSRC.REC.1399.067

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Conflicts of interest: *None to declare.*

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