

Effects of Perceived Autonomy Support in the Physical Education on Basic Psychological Needs Satisfaction, Intrinsic Motivation and Intention to Perform Physical Activity in High School Students

Fatemeh Beigom Hosseini¹, PhD Student;  Saeed Ghorbani^{1*}, PhD;  Reza Rezaeeshirazi¹, PhD

¹Department of Physical Education and Sport Sciences, Aliabad Katoul Branch, Islamic Azad University, Aliabad Katoul, Iran

*Corresponding author: Saeed Ghorbani, PhD; Department of Physical Education and Sport Sciences, Aliabad Katoul Branch, Islamic Azad University, Daneshjoo Blv. Aliabad Katoul, Postal Code: 49417-93451, Golestan, Iran. Tel: +98-17-34224500; Fax: +98-17-34225673; Email: s.ghorbani@aliabadiu.ac.ir

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Abstract

Background: Finding factors or conditions that could increase the level of physical activity in students is a controversial topic concerning school health. We conducted the current research to investigate the effects of perceived autonomy support in physical education class on intrinsic motivation and intention to participation of high-school students in leisure-time physical activity. Gender differences were also reported.

Methods: This study utilized a descriptive-correlation approach. Our participants comprised 400 high school students, including 100 tenth-grade boys, 100 eleventh-grade boys, 100 tenth-grade girls and 100 eleventh-grade girls, from Aliabad Katoul, Golestan, Iran, in 2019. The data was collected using standard questionnaires. We employed structural equation method to examine the associations between variables, and analysis of variance (ANOVA) to examine the gender differences.

Results: Descriptive statistics showed that boys and girls of the same grade had almost identical age. The results of path analysis revealed that perceived autonomy support positively influenced psychological need satisfaction and intrinsic motivation ($T=1.96$ and $T=2.09$, respectively). Moreover, psychological need satisfaction positively affected intrinsic motivation in physical education class ($T=15.23$). Furthermore, intrinsic motivation in physical education class was transferred to intrinsic motivation in leisure-time ($T=6.82$). Intrinsic motivation in leisure-time positively affected the inclination to perform physical activity outside school ($T=7.05$). Finally, boys were observed to have higher perceived autonomy, higher motivation and be more willing to do physical activity compared to girls ($P<0.001$).

Conclusions: Perceived autonomy support plays an important role in motivating students to be physically active. We discussed our results based on the self-determination theory. Practical and clinical implications were presented to physical education teachers and physicians.

Keywords: Perceived autonomy support, Basic needs, Motivation, Exercise, Schools

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1. Introduction

Physical activity (PA) is a phenomenon with potentials for developing behaviors and providing a suitable context for creating a healthy lifestyle. Regular PA has been reported to have positive effects on health, such as improving fitness, increasing self-confidence, and reducing the risk of obesity and obesity-associated diseases (1-3). However, modern life has increased the tendency to have sedentary lives, which is also observed among children and adolescents. Furthermore, numerous studies on PA behavior of children and adolescents have shown that PA decreases significantly with age (4, 5). These facts necessitate early interventions for enhancing the level of PA and sport participation in children and adolescents.

School could have a significant impact on the

level of physical fitness of students by improving the health or physical fitness of students, increasing PA, or psychological determinants (such as knowledge, motivation, and attitude toward PA). The physical education (PE) in school offers educational backgrounds to promote motivation and participation in PA. School environment is a meaningful and effective to stimulate and support all children and adolescents to become more physically active, which could subsequently result in healthier society (6).

Implementing school PA programs reflects a holistic approach that requires children to participate in at least 60 minutes of PA on a daily basis. However, researches have demonstrated that almost 80% of school students worldwide do not adhere international guidelines (7). Wang and colleagues (8) reported that school-aged adolescents do not follow international guidelines for

at least 60 minutes of daily PA. Moreover, on the days they had PE in school, students have more PA compared to the days without PE, which indicates the significant influence of sports and PE on the overall PA level of school students. Therefore, participation of school-students in PA has become a key topic in research on PE, exercise, and health over the past decades. Accordingly, school is considered as a highly important environment since primarily, sports and PE in school significantly influence PA level of school students, and secondly, an important goal of sports and PE in school is to encourage school students to participate in PA in their leisure time (6).

In the present study, we aimed to examine the ways through which PE class can enhance motivation of adolescents to participate in PA and sport outside the school. Furthermore, the current work examined a conceptual model that explains under what circumstances children and adolescents are likely to transfer motivation from sports and PE in school to PA in their leisure-time (outside school). This model proposes the following motivational sequence in its hypotheses: 1) supporting the perceived autonomy of adolescent students within PE class in school by using student-based teaching methods meets the psychological needs of adolescent students in PE class, 2) accommodating the psychological needs of adolescent students in PE class leads to a source of intrinsic motivation in PE class, 3) intrinsic motivation in PE class in school affects intrinsic motivation outside school, and 4) intrinsic motivation outside school affects the intention to do PA (Figure 1).

Perceived autonomy support is considered as an important psychological component of participation

in physical activity and sport (9). Autonomy is one of psychological needs within the self-determination theory. This is a popular theory that has long been the theoretical underpinning of research into promoting the motivation of individuals in order to increase their participation in physical activity and adopt an active lifestyle (10-17). Self-determination theory supports three basic psychological needs that, if satisfied, could facilitate one's growth, integration, and health. Psychological needs are autonomy (the focus of the present study), competence, and relatedness. Autonomy refers to the integrated processing of capabilities and matching these capabilities to emotions, needs, and limitations. In fact, autonomy is the need to experience the freedom of performing the behavior. Once individuals act autonomously, they become more deeply involved in activities and their performance becomes more productive (9-17).

Previous researches have indicated that autonomy satisfaction was positively associated with the participation of the young in leisure time PA (18, 19). Moreover, it increased autonomous motivation in fostering sport participation in children and adolescents (20). Intervention studies also illustrated that autonomy-based exercise intervention increased motivation and PA in young people (9, 21). However, the effects of perceived autonomy support within PE class on motivating the adolescents for participating in leisure time PA and sport has not yet been fully understood. The lack of motivation to participate in PA in adolescents may have significant negative consequences for public health. If the goal of PE is to promote PA throughout life, it is necessary that students have a pleasurable experience in these classes. Accordingly, it is critical to put under question the

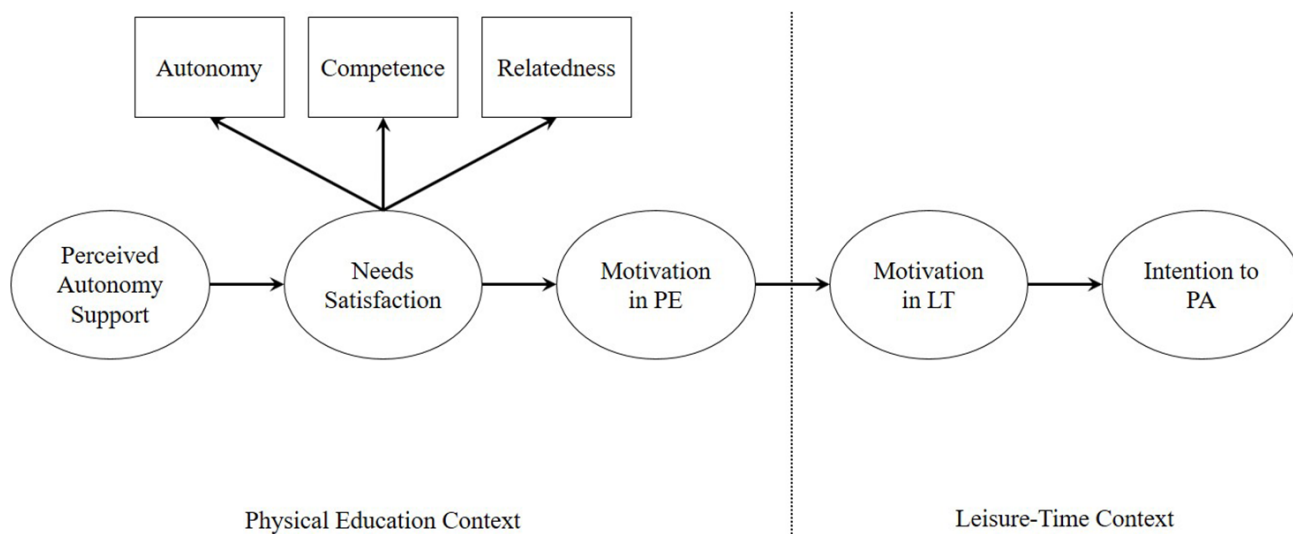


Figure 1: Conceptual model of the current research.

perceived autonomy support in PE class in high school and its effects on motivation and intention to do PA outside school. Thus, we aimed to investigate a conceptual model regarding the effects of perceived autonomy support in PE class on intrinsic motivation and its subsequent intention to do PA outside school in high-school students. The current research adds to the body of knowledge around: 1) the role of perceived autonomy support in PE class in motivating students for participating in PA and sport outside school, and 2) the role of perceived autonomy support on motivation and willing to perform physical activity among *adolescents*.

2. Methods

The present study utilized a descriptive-correlation approach. The protocol was approved by University Ethical Committee. Parents provided written consent for participation of their children.

2.1 Participants

The participants consisted of 400 high school students, among whom there were 100 tenth-grade boys (first year of high school), 100 eleventh-grade boys (second year of high-school), 100 tenth-grade girls, and 100 eleventh-grade girls from Aliabad Katoul, Golestan, Iran, in 2019. This number of participants was selected based on the guidelines of Krejcie and Morgan (22). We selected the statistical sample from regular schools of Aliabad Katoul. To select the participants, after obtaining permissions and coordination with the education departments of the mentioned city, a statistical sample was selected by a cluster random sampling method. To do this, we initially divided the population (regular high schools of city) into smaller regions (clusters). Afterwards, from each region, one of the existing schools was randomly selected and ultimately, from each school, students were randomly selected. They were asked to fill in the research questionnaires.

2.2 Measures

2.2.1 Perceived Autonomy Support: We utilized a 5-question scale in order to measure perceived autonomy support in PE class (23). Each question was scored on a Likert scale from strongly disagree (1) to strongly agree (7). We averaged all the items of this questionnaire to calculate the total score. Reliability of the original form of this questionnaire was assessed by its designers, and its Cronbach's alpha coefficient was 0.91 (23). In this study, the initial questionnaire was converted into

Persian using the standard method of translation and retranslation. subsequently, nine experts confirmed the validity of the Persian version of this questionnaire (CVI=1.00, CVR=0.78). The experts received the questionnaires via e-mail and expressed their opinions on the content of the questions. Furthermore, we measured the reliability of this questionnaire whose Cronbach's alpha coefficient was 0.96.

2.2.2 Basic Psychological Needs Satisfaction: Basic psychological needs satisfaction was measured employing the Sport Climate Questionnaire comprising 11 questions (24). Each question was scored on a Likert scale from strongly disagree (1) to strongly agree (7). The total score of this questionnaire was obtained by averaging all the items. The designers of this questionnaire measured its reliability with a reported Cronbach's alpha coefficient of 0.89 (24). In this research, we used standard method of translation and retranslation to convert the initial questionnaire into Persian. Nine experts, who received the questionnaires via e-mail, then confirmed the validity of the Persian version of this questionnaire (CVI=0.88, CVR=1.00). Furthermore, the reliability of this questionnaire was measured, whose Cronbach's alpha coefficient was 0.91.

2.2.3 Intrinsic Motivation: Intrinsic motivation in PE class and outside school were assessed with eight questions designed on the basis of Intrinsic Motivation Scale (25). Each question was scored on a Likert scale from strongly disagree (1) to strongly agree (7). The total score of this questionnaire was calculated by averaging all the items. Its designers assessed the reliability of its original form with a Cronbach's alpha coefficient of 0.90 (25). In this study, the initial questionnaire was converted into Persian with the standard method of translation and retranslation. Afterwards, nine experts confirmed the validity of the Persian version of this questionnaire (CVI=0.88, CVR=0.78). These experts received the questionnaire via e-mail and were asked to express their opinions on the content of the questions. Moreover, we measured the reliability of this questionnaire whose Cronbach's alpha coefficient was 0.97.

2.2.4 Intention to PA: The inclination to do PA was measured using two questions (23) which were assessed with a Likert scale from strongly disagree (1) to strongly agree (7). We averaged all the items of this questionnaire in order to measure the total score. The designers of the questionnaire measured the reliability of its original form and reported a Cronbach's alpha coefficient of 0.87 (23). Herein, standard method of translation and retranslation was utilized to convert

the initial questionnaire into Persian. Nine experts then expressed their opinions via email on the content of the questions and confirmed the validity of the Persian version (CVI=1.00, CVR=1.00). In addition, we measured the reliability of this questionnaire and its Cronbach’s alpha coefficient was found to be 0.89.

2.3 Data Analysis

We analyzed the obtained data with SPSS 22 and Smart PLS software packages. The statistical characteristics of the participants and research variables were determined using means and standard deviations. For the calculation of the reliability coefficients of the questionnaires, we employed the Cronbach’s alpha coefficient. Kolmogorov-Smirnov test was applied to test normal distribution of data. Correlation test was used to measure the relationships between the variables of the research. We utilized structural equation method to investigate the associations among the variables and test the research model. Finally, analysis of variance (ANOVA) was applied to compare the genders. P-value was determined at P<0.05.

3. Results

3.1 Descriptive Data

Table 1 represents the mean and standard deviation of the participants’ age and research variables. It shows that boys and girls of the same grade had almost

identical ages. Moreover, descriptive statistics revealed that boys reported higher scores compared to girls in perceived autonomy support, psychological needs satisfaction, motivation in PE, motivation in LT, and willing to perform PA.

3.2 Relationships between Research Variables

The results of Kolmogorov-Smirnov tests demonstrated that all the research variables were not normally distributed (all P<0.05). Therefore, we used Spearman correlation test to assess bidirectional relationships between research variables (Table 2). The results showed significant associations between perceived autonomy support and psychological need satisfaction and motivation in PE (all P<0.001). Moreover, there was a positive association between psychological need satisfaction and motivation in PE. A positive correlation was also observed between motivation in PE and motivation in leisure time. Eventually, motivation in leisure time was significantly associated with the inclination to perform PA (all P<0.001).

3.3 Path Analysis

Table 3 and Figure 2 demonstrate the findings of the path analysis. According to them, perceived autonomy support in PE class positively influenced psychological need satisfaction and motivation in PE (all T>1.96). They also demonstrated that psychological need

Table 1: Descriptive data of research variables across age and grade

Students	Age (years old)	Perceived Autonomy Support	Needs Satisfaction	Motivation in PE	Motivation in LT	Intention to PA
10 th grade boys	15.43±0.57	4.09±0.90	4.18±0.82	4.13±0.87	4.24±0.92	4.21±0.90
11 th grade boys	16.71±0.62	4.08±0.88	4.20±0.82	4.15±0.86	4.26±0.93	4.22±0.89
10 th grade girls	15.37±0.59	3.46±0.92	3.56±0.84	3.51±0.86	3.63±0.88	3.53±0.87
11 th grade girls	16.63±0.86	3.37±0.94	3.48±0.85	3.43±0.87	3.56±0.91	3.44±0.89

PE: Physical education; LT: Leisure-time; PA: Physical activity

Table 2: Results of Spearman correlation tests between research variables

	1	2	3	4	5
1. Perceived Autonomy Support	-				
2. Need Satisfaction	r=0.942 P<0.001	-			
3. Motivation in PE	r=0.975 P<0.001	r=0.968 P<0.001	-		
4. Motivation in LT	r=0.971 P<0.001	r=0.949 P<0.001	r=0.976 P<0.001	-	
5. Intention to PA	r=0.943 P<0.001	r=0.916 P<0.001	r=0.949 P<0.001	r=0.941 P<0.001	-

PE: Physical education; LT: Leisure-time; PA: Physical activity

Table 3: Results of path analysis between exogenous and endogenous variables in boys

Path	β	T-value
1 Perceived autonomy support - psychological needs satisfaction	0.704	18.181
2 Perceived autonomy support - motivation in PE	0.110	2.099
3 Psychological needs satisfaction - motivation in PE	0.669	15.234
4 Motivation in PE - motivation in LT	0.451	6.827
5 Motivation in LT - intention to PA	0.530	7.052

PE: Physical education; LT: Leisure-time; PA: Physical activity

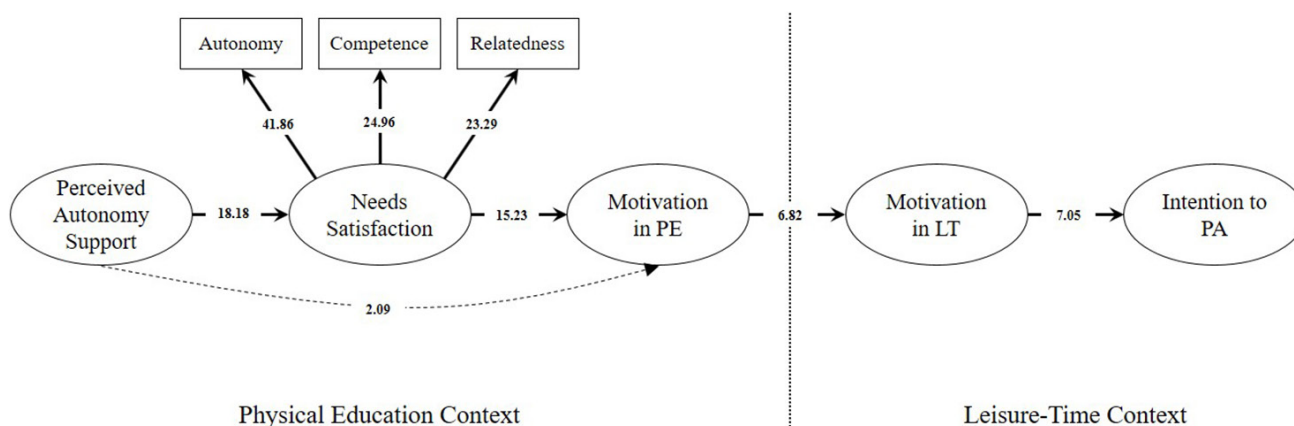


Figure 2: Results of path analysis in the form of T-Values

satisfaction in PE class positively affected motivation in PE class ($T > 1.96$). Moreover, intrinsic motivation in PE class was directly shifted to intrinsic motivation in leisure time ($T > 1.96$). Finally, intrinsic motivation in leisure time had positive effects on their willing to do PA outside school ($T > 1.96$). The obtained results of model fit depicted that Commuality was 0.919, R^2 was 0.579, and Goodness of Fit Index (GOF) was 0.729. This amount of GOF indicates very good fit for the research model.

3.4 Gender Differences

The results of ANOVA demonstrated that boys had a higher perceived autonomy support in PE class than girls (4.09 and 4.08 for respectively 10th and 11th grade boys versus 3.46 and 3.37 for respectively 10th and 11th grade girls, $P < 0.001$). Boys also reported higher scores of the psychological needs satisfaction in PE class than girls (4.18 and 4.20 for 10th and 11th grade boys respectively versus 3.56 and 3.48 for 10th and 11th grade girls, respectively, $P < 0.001$). Moreover, the results showed that boys reported higher scores than girls regarding intrinsic motivation in PE class (4.13 and 4.15 for respectively 10th and 11th grade boys versus 3.51 and 3.43 for respectively 10th and 11th grade girls, $P < 0.001$); the same trend was observed concerning intrinsic motivation in LT (4.24 and 4.26 for respectively 10th and 11th grade boys versus 3.63 and 3.56 for respectively 10th and 11th grade girls, $P < 0.001$). Finally, boys had higher

scores concerning their willing to do PA outside school compared to girls (4.21 and 4.22 for respectively 10th and 11th grade boys versus 3.53 and 3.44 for respectively 10th and 11th grade girls, $P < 0.001$).

4. Discussion

Previous researches have shown that regular PA is an important factor for long-term health. Therefore, finding factors or conditions that could increase the level of PA in children and adolescents is of great importance. Considering the significance of PE class in school for fostering the level of PA of students, we designed the current research to investigate the effects of certain psychological factors within PE class on high school students' tendency to have leisure time PA. In this study, we examined the role of perceived autonomy support in PE class on intrinsic motivation and inclination of high school students to participate in outside school PA. The gender differences were also reported. This research was based on the theoretical foundations of self-determination theory (10-17). According to this theory, people with a greater sense of perceived autonomy in one activity are more likely to have greater intrinsic motivation and tendency to be involved in that activity (10-17).

Our findings demonstrated that perceived autonomy support positively influenced psychological needs satisfaction and intrinsic motivation in PE in

school. Moreover, intrinsic motivation created in PE environment in school is transferred to intrinsic motivation outside school. Subsequently, motivation outside school could positively affect the willing to do PA. These findings were in accordance with those of previous studies (23, 26-28). Intrinsic motivation is an important factor in the occurrence of PA behavior, since it insists on the occurrence of activity in the absence of any external motivation (26). For example, teachers who can enhance students' intrinsic motivation in PE class can encourage students to perform further PA in PE class. It might be possible that promotion of perceived autonomy support in PE class made students have a sense of control over their activities which subsequently led to a sense of competence and satisfaction, which in turn leads to autonomous participation in PA. Additionally, in the absence of intrinsic motivation to engage in PE class, the person always needs external motivating components to engage in PA, and ultimately this cannot lead to positive emotions, competence and satisfaction in PE class. More importantly, the results also implied that the intrinsic motivation for PA created as a result of perceived autonomy support in PE class shifted to the intrinsic motivation for PA in leisure time. Owing to the fact that any intrinsic motivation in adolescents in PE environment in school could motivate them to do PA outside school (leisure time), this transition is a very important finding of the present study.

Based on the self-determination theory (10-17), the source of autonomous behaviors and meeting the psychological needs can result into performing behaviors through the process of internalization. Internalization is the process through which behaviors that previously existed for reasons with an external source emerge from an internal causal source (intrinsic motivation). Internalization shows that behavioral settings are not only inflexible and fixed, but are flexible and changeable, and could be mediated by supportive elements in an environment with the potential to support autonomous behaviors (such as PE class in school). Researches have suggested that physical educators can develop higher intrinsic motivation and strong insistence on PA behavior by providing guidelines and feedback focusing on self-directed learning. They could also do so by giving students the right to choose their exercises in PE class (29). Additionally, it has been shown that PE teachers' support for autonomy in PE class can lead to the transfer of a source of causation from an external source to an internal source (30). The results of the present study are in accordance with those of previous studies confirming that supporting students' sense of autonomy in PE class improves the intrinsic motivation

to do PA, and, subsequently, intrinsic motivation created in PE environment in school can also be transferred to the out-of-school environment (leisure time). The students who understand the supportive behaviors of PE teacher regarding to the autonomy in PE class, begin to internalize PA behaviors and could subsequently increase their tendency to participate in PA.

Consistent with the results of previous researches (31, 32), our findings depicted that boys reported significantly higher perceived autonomy support, motivation, and inclination to perform PA in comparison to girls. A potential justification behind why girls had less perceived autonomy support and motivation in PE classes might be the structural differences in PE classes of male and female at school. For instance, physical educators might offer different contents or sport activities to male and female students. Another possible reason might be social and cultural limitations for engaging in social and sport activities outside home and school, which may influence less participation of girls in performing PA (31, 32).

Cross-sectional design of the current research could be considered as a limitation, which creates limitations for examining causal influences of perceived autonomy support on the participation of adolescents in sport and physical activity. Furthermore, we did not measure the social-economic status of the students. Hence, further researches with emphasis on socio-economic status of students are required to provide a more comprehensive view of the influence of autonomy support on PA among adolescents. Ultimately, we did not perform validity methods, such as factor analysis, convergent validity or test-retest for measuring the validity of questionnaires used in the current work. Accordingly, we strongly suggest that future studies perform such validity methods for measuring the validity of questionnaires.

5. Conclusion

In conclusion, since the majority of past studies have investigated the effects of perceived autonomy support on PA among children, the present research added to the body of knowledge around the role of perceived autonomy support within PE class in motivating the *adolescents* for participating in leisure time PA. Based on the obtained results, we could conclude that perceived autonomy support in PE class positively affects psychological needs satisfaction and intrinsic motivation in PE class. Moreover, intrinsic motivation in PE class can be transferred into the intrinsic motivation outside school and it can subsequently

increase students' tendency to do PA outside school. Finally, boys reported to have higher perceived autonomy support, more intrinsic motivation and inclination to perform PA than girls. The results of this study might have significant practical and clinical implications. As a practical perspective, in order to improve the students' participation in PA inside and outside school, PE teachers should encourage the perceptions of the students concerning autonomy in PE class. Moreover, as a clinical perspective, our findings may indicate that the prescribing PA using more autonomy-based methods should be considered as a feasible option within clinical practice.

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Ethical Approval

This study is part of a PhD thesis by the first author. Ethics Committee of Islamic Azad University of Aliabad Katoul approved the protocol of the current research (IR.IAU.AK.REC.1398.001). The participants voluntarily participated in this study. Students' parents gave their informed consent in writing.

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