



Effects of Supporting the Need for Novelty in Physical Education on Students' Motivation and Intention to Participate in Physical Activity

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Abstract

Introduction: The participation of students in regular physical activity (PA) is a crucial aspect of their overall health. Therefore, it is important to identify factors or conditions that can increase their engagement in such activities.

Objectives: This study aimed to examine the impact of supporting the need for novelty on motivation and intention to engage in PA.

Methods: The research employed a descriptive-correlation method and involved 384 middle school students, comprising of 192 boys and 192 girls. Standard questionnaires were used to collect data, which were then analyzed using the structural equation method.

Results: The results of the path analysis revealed that supporting the need for novelty positively and significantly influenced the satisfaction of psychological needs, including autonomy, competence, relatedness, and novelty, as well as autonomous motivation. However, it had an inverse and significant effect on controlled motivation. Furthermore, autonomous motivation had a positive and significant impact on the intention to engage in PA, while controlled motivation had an inverse and significant effect on this intention.

Conclusion: These findings highlight the importance of incorporating novelty in physical education (PE) to motivate students to participate in PA. Therefore, it is crucial for PE teachers to adopt teaching styles that support the need for novelty.

Keywords: Exploratory Behavior, Motivation, Exercise, Physical Education, School Teachers

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1. Introduction

Physical activity (PA) refers to physical movements that are associated with energy consumption and can be performed in various forms such as group or individual sports activities, active transportation, household activities, etc. (1,2). Researches have shown that participating in PA has many benefits for the mental and physical health of youth (3-8). Hence, the World Health Organization (WHO) recommends that youth aged 6 to 17 years should do at least 60 minutes of moderate to vigorous PA (MVPA) per day (9). However, youth around the world do not participate in regular PA (10,11). Therefore, the participation of youth in regular PA has become one of the important research challenges as well as an important concern of parents and physical education (PE) teachers.

PE has the potential to enhance students' motivation and engagement in PA both in and out of school, ultimately resulting in numerous health advantages. It is crucial for PE teachers to establish an environment that caters to students' basic psychological needs (BSNs) and boosts their drive to take part in physical activities during PE. Therefore, the instructional methods employed by PE teachers play a significant role in encouraging students to engage in activities and PA beyond the school setting.

Regarding the PE, the theory of self-determination (SDT) is a well-known theory that has been empirically supported and is the theoretical basis of many studies on increasing people's motivation to participate in sports activities presented in PE (14-19). This theory focuses on different types of motivation ranging from autonomous motivation to controlled motivation (15). Studies indicate that individuals who are intrinsically motivated tend to excel in performing tasks, whereas those who are extrinsically motivated are more inclined to persist in their actions when an external incentive is present (14).

According to SDT, humans have three BSNs: autonomy, competence, and relatedness (14-19). Regarding the participation of children in sports activities in PE, several studies have shown that the satisfaction of BSNs leads to an increase in the autonomous motivation and real participation of children in sports activities in PE (13,20,29). Henceforth, it has been suggested that PE instructors should embrace instructional approaches that are centered around fostering BSNs in PE.

In recent years, González-Cutre et al., (30) proposed the need for novelty as a BSN alongside the needs raised in SDT. The need for novelty pertains to the longing for encountering something that has not been encountered previously or that deviates from the usual daily routine (30). Novelty is essential in various



aspects of life, including education, employment, recreation, PA, and social interactions. For instance, individuals like students and athletes must mix familiar routines with new experiences to achieve an ideal level of challenge (striking a balance between familiarity and novelty) in order to enhance their motivation, contentment, overall health, and effectiveness (31-33). Subsequent studies have shown that novelty support satisfies BSNs, which in turn predicts autonomous motivation (30-36). In addition, some evidence showed that satisfaction with novelty in PE is generally related to enjoyment of PE activities (33,36). However, the effects of supporting the need for novelty with children's motivation and participation in PA in PE have not been well defined. Therefore, the purpose of this research was to investigate the effect of supporting the need for novelty on the satisfaction of BSNs, motivation and intention to participate in PA in PE.

2. Methods

This study used a descriptive-correlational method. The study was carried out in accordance with the ethical guidelines outlined in the Declaration of Helsinki, and the parents granted written permission for their children to take part. The participants consisted of 384 high school students, of whom 192 were boys and 192 were girls (Mage = 12.33±1.46). This number of participants was selected based on the guidelines of Krejci and Morgan. The statistical sample of this research was selected from regular schools in Tehran. To select the participants, after obtaining permission and coordination with the education departments, a statistical sample was selected using available sampling method and all the research subjects completed the research questionnaire.

To measure the support of the need for novelty in PE, BSNs measurement scale (30) was used. The scale consisted of five items (for example: "In PE I think I often discover new things"). Responses were scored using a five-point Likert scale. The internal consistency of this scale was 0.83. In this research, the Cronbach's alpha coefficient was 0.86. Also, the satisfaction of BSNs in PE was measured using the scale of BSNs in sport

(37,38), which consisted of 12 questions divided into three categories, including autonomy, competence and relatedness. To measure novelty satisfaction, six items from the novelty need satisfaction scale (30) with some items of Basic Psychological Needs in Sports Scale (38) were mixed. These items were scored on a 5-point Likert scale. In this research, the Cronbach's alpha coefficient was 0.91. Also, the perceived source of causality questionnaire in PE (37) was used to measure motivation in PE. This questionnaire consisted of 16 items scored on a 7-point Likert scale. Also, this questionnaire measures four different ranges of motivation, from autonomous motivation to controlled motivation. In this research, the Cronbach's alpha coefficient was 0.92. Finally, intention to participate in PA was measured using two questions (39), rated on a seven-point Likert scale. In this research, the Cronbach's alpha coefficient was 0.89.

The data collected in this study were analyzed utilizing SPSS version 26 and Lisrel version 8.8. Mean and standard deviation (SD) were employed to depict the research variables. Cronbach's alpha coefficient was utilized to assess the questionnaires' reliability. Pearson's correlation test was conducted to evaluate the bidirectional relationships among the research variables. Independent t-test was performed to compare the scores between boys and girls. Lastly, the structural equation method was applied to investigate the relationship between the variables and assess the research model. A significance level of 0.05 was considered.

3. Results

Table 1 shows the mean and SD of the age of the participants as well as the research variables. The results showed that boys and girls were almost the same age. In addition, descriptive statistics showed that boys reported higher scores than girls in perceived novelty support, satisfaction of BSNs, autonomous motivation in PE, and intention to PA; while girls reported higher scores in controlled motivation than boys. All these differences were statistically significant (all < 0.05).

Table 1. Descriptive Statistics by Gender.

Gender	Age (year)	Novelty Support	Needs Satisfaction	Autonomous Motivation	Controlled Motivation	Intention
Boys	12.45±1.22	2.18±1.84	3.11±1.40	3.85±1.70	3.13±1.53	4.17±1.69
Girls	12.22±1.61	1.72±1.01	2.31±1.11	2.90±0.97	3.78±1.24	2.498±1.35

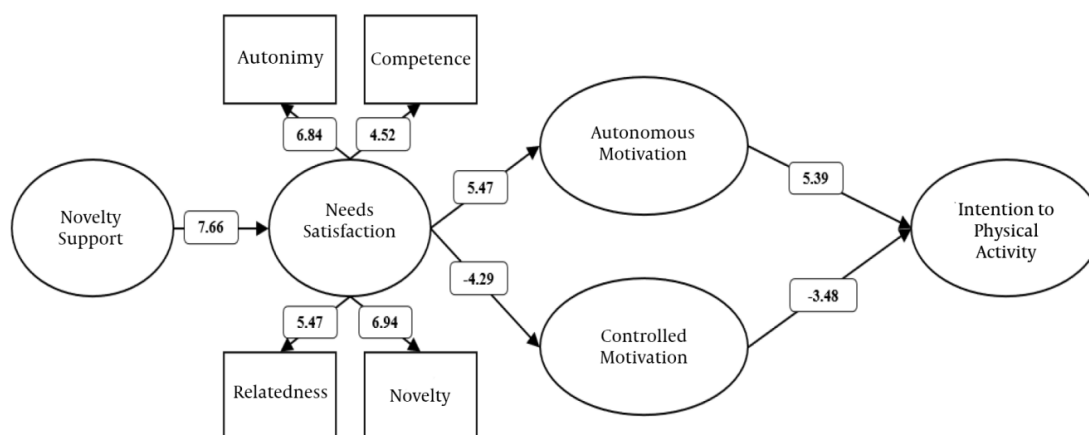
The findings from the Pearson correlation test indicate that there is a significant and positive association between novelty support in PE and BSNs as well as autonomous motivation in PE ($r=0.690$, $P<0.001$; $r=0.547$, $P<0.001$, respectively). Conversely, there is an inverse and significant relationship between satisfying the need for novelty in PE and controlled motivation ($r= -0.328$, $P<0.001$). Additionally, there is a positive and significant correlation between autonomous motivation in PE and the intention to engage in PA ($r=0.517$, $P<0.001$). On the other hand, there is an inverse and significant relationship between controlled motivation and the intention to engage in PA ($r= -0.470$, $P<0.001$).

Also, Table 2 and Figure 1 show the path analysis findings. The results showed that supporting novelty in PE positively and significantly affects the satisfaction of

BSNs and autonomous motivation in PE; But it has an indirect and significant effect on the controlled motivation. Also, the results showed that satisfying BSNs in PE has a positive and significant effect on autonomous motivation in PE; But it has an indirect and significant effect on the controlled motivation. Finally, autonomous motivation has a positive and significant effect in PE; But the controlled motivation has an indirect and significant effect on the intention to PA. The model fitting results are given in Table 3. The results showed that the research model has a good fit (RMSEA = 0.07).

Table 2. Path Analysis Results.

Path	β	T
Novelty Support => Needs Satisfaction	0.49	7.66
Novelty Support => Autonomous Motivation	0.61	10.15
Novelty Support => Controlled Motivation	0.36	- 4.46
Needs Satisfaction => Autonomous Motivation	0.51	5.47
Needs Satisfaction => Controlled Motivation	0.34	- 4.29
Autonomous Motivation => Intention	0.41	5.39
Controlled Motivation => Intention	0.29	- 3.48

**Figure 1.** Research Model in T-Value.**Table 3.** Model Fit Results.

Index	Normal Range	Obtained Value	Result
RMSEA	< 0.08	0.07	Good Fit
χ^2 / df	< 3	2.70	Good Fit
RMR	Close to 0	0.02	Good Fit
NFI	> 0.09	0.96	Good Fit
CFI	> 0.09	0.97	Good Fit

4. Discussion

Prior studies have indicated that consistent PA plays a crucial role in maintaining long-term health (4-8). Hence, it is crucial to identify factors or circumstances that can enhance PA among young individuals. Recognizing the significance of PE in boosting students' PA, this study aimed to examine the impact of fostering a need for novelty on students' motivation and intention to PA. This research is grounded in the principles of SDT, which suggests that factors fulfilling BSNs can enhance an individual's motivation and involvement in a PA.

Our findings showed that novelty support in PE positively affects the satisfaction of BSNs and autonomous motivation in PE and has an inverse effect on controlled motivation. In addition, autonomous motivation was able to have a positive effect on the intention to do PA in PE. These findings were consistent with the findings of previous studies based on supporting BSNs (13; 20-29). These findings suggest that autonomous motivation, typically rooted in intrinsic motivation, plays a crucial role in the manifestation of PA behavior. It emphasizes the engagement in activity even in the absence of external incentives (16,17). For example, teachers who can enhance students' autonomous motivation in PE can encourage students to participate more in PA in PE. According to the findings of this study, it might be possible that promoting the need for novelty in PE will make students feel more diverse in their activities, which will subsequently lead to a sense of autonomy, competence, and satisfaction, which in turn will lead to creating autonomous participation in physical and sports

activities in PE. In addition, in the absence of autonomous motivation to participate in PE, a person always needs external motivational components to participate in the PA of PE, and ultimately this cannot lead to positive feelings, competence and satisfaction in PE. According to the results of some studies that have shown that the motivation created in PE can lead to the motivation to do PA outside the school, it seems necessary that PE teachers use teaching styles based on supporting BSNs to thereby increase students' intrinsic motivation to participate in PE activities as well as outside of school (i.e., leisure time).

According to SDT (14,15,18,19), autonomous behaviors and satisfaction of BSNs can lead to performing behaviors through the internalization process. The phenomenon of internalization refers to the transformation of behaviors that were originally driven by external factors into behaviors that are now motivated by internal factors. This process implies that behavioral patterns are not solely rigid and unalterable, but rather adaptable and modifiable. Moreover, the presence of supportive elements within an environment, such as a PE program, can facilitate the development of independent behaviors. Based on previous studies (31-36), some strategies that PE teachers can adopt to support the need for novelty include the introduction of alternative sports (such as volleyball), trendy activities that are based on fast PA (such as martial arts), out-of-school activities (such as parkour), using digital resources (such as mobile applications), gamification, designing prompting questions, helping to create a clear action plan, and offering a wide and innovative range of PA during PE.

The present research has some limitations, too. As the first limitation, we can point to the cross-sectional design of the present study, which creates limitations for examining the causal effects of supporting the need for novelty on students' participation in PA in PE and leisure-time. In addition, the socio-economic status of students was not measured in the current research, which necessitates the need for more research to provide a more comprehensive view of the impact of supporting novelty needs on children's PA. Finally, PA behavior was not investigated in the present research, which needs to be investigated in future studies. In this regard, the use of accelerometers is emphasized for the accurate examination of students' PA behavior.

4.1. Conclusions

As a conclusion, it can be stated that supporting the need for novelty created autonomous motivation and increased students' intention to participate in PA in PE. This result in itself can be very important, because it shows the importance of creating diversity in sports activities in PE to create internal motivation in students. The results of this study may have significant practical and clinical implications. As a practical point of view, in order to improve students' participation in PA inside and outside of school, PE teachers should improve students' understanding of diversity in PE. In addition, as a clinical point of view, our findings may be considered to increase the level of PA of inactive students using methods based on creating more novelty and variety in PE.

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Footnotes

Authors' Contribution: Study concept and design: V. R; A. V. Acquisition of data: A. V. Analysis and interpretation of data: A. V. Drafting of the manuscript: V. R; A. V. Critical revision of the manuscript for important intellectual content: V. R. Statistical analysis: D. S. Administrative, technical, and material support: V. R; A. V. Study supervision: V. R; D. S.

Conflict of Interests: The researcher confirms that there is no conflict of interests in this study with any participant.

Data Availability: The data that support the findings of this study are openly available upon request from the corresponding author.

Ethical Approval: Approval for this study was obtained from the university. The author confirms that all steps . The requirements of this study comply with ethical guidelines. Participants were informed about the characteristics of the study and gave written informed consent.

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