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RESEARCH ARTICLE

Intrinsic Motivation to Increase the Involvement of Student in Physical Education

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ABSTRACT

Physical Education classes in primary schools are now more student focused. Teachers should adopt approaches that engage less motivated students in activities. Competition can enhance motivation and interest among primary school students in Physical Education. This study aims to identify strategies to increase intrinsic motivation and student involvement in Physical Education. Utilizing a quantitative design, data was collected through the Intrinsic Motivation Inventory (IMI) watand analyzed using descriptive statistics. The findings revealed that incorporating competitive elements significantly boosted students' intrinsic motivation and participation in Physical Education classes. This study provides valuable insights for teachers and serves as a reference for future research, emphasizing the importance of tailored teaching methods to enhance student engagement.

Contribution/Originality: This study contributes to the existing literature by exploring the role of intrinsic motivation in enhancing student participation in physical education.

1. Introduction

Engaging in regular physical activity significantly impacts overall health and reduces the risk of chronic conditions like cardiovascular diseases, diabetes, cancer, and depression (Anderson & Durstine, 2019). According to the World Health Organization [WHO] (2020) recommends that adults engage in a minimum of 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of vigorous-intensity activity per week. Moreover, it is advised that children and adolescents accumulate at least 60 minutes of moderate to vigorous physical activity daily (Piya-amornphan, et al., 2020).

A worldwide framework for children and adolescents has outlined nine indicators associated with physical activity. These include five behavioral aspects: overall physical activity, engagement in organized sports, participation in active play, involvement in active transportation, and avoidance of excessive sedentary behavior. Furthermore, four

significant influences have been identified: family and peers, school, community and physical environment, and government strategies and investments (Vazquez & Cubbin, 2020). Physical Education is a compulsory subject in the curriculum in Malaysia. The Physical Education curriculum in Malaysia aims to help students develop the physical and mental skills necessary for a healthy and active life. Additionally, the curriculum aims to enhance students' social skills and cooperation (Norhazira, Sahril & Nor Aijratul Ashikin, 2021). Physical Education in Malaysia encompasses various types of physical activities such as gymnastics, running, swimming, basketball, soccer, and others.

Physical Education brings various benefits to an individual's life, both physically and mentally. It can improve physical health, and individuals can enhance their health by engaging in regular physical activity. Sports help strengthen muscles, increase endurance, improve cardiovascular fitness, and help maintain a healthy weight. Sports also assist individuals in improving concentration and focus on their studies (American College of Sports Medicine, 2021). Therefore, Physical Education can aid students in learning, as they can develop better concentration and focus skills. Overall, Physical Education is crucial as it helps individuals develop the physical and mental skills needed for success in life (Australian Government Department of Health, 2021).

These Physical Education activities are designed specifically to develop students' psychomotor skills, coordination, balance, and endurance. Moreover, the Physical Education curriculum in Malaysia also promotes a healthy and active lifestyle. Students will be taught about the importance of sports and physical activities in maintaining body health and fitness, as well as balanced nutrition (Ahmad Fadly, Muhamad Suhaimi, & Jenorita, 2021). In addition to classroom lessons, students in Malaysia can also participate in various extracurricular sports activities. Extracurricular activities are voluntary activities that are beneficial during or outside of school hours, towards the formation of commendable personal character (Micheal, 2023). Schools usually have sports teams participating in competitions and championships, as well as sports clubs that allow students to develop their interests in specific sports. The Ministry of Education in Malaysia is dedicated to enhancing the Physical Education curriculum, aiming to provide students with high-quality physical education tailored to their requirements. The goal is to foster improved health, increased activity levels, and success in students' lives through this initiative.

Physical Education additionally exerts a positive influence on students' intrinsic motivation. Intrinsic motivation emanates from an individual's internal drive, the inclination to participate in an activity for personal pleasure or fulfillment. When students experience a sense of proficiency in physical activities, they are more inclined to sustain motivation for continued engagement (Chirkov, Ryan, Kim, & Kaplan, 2019). Physical education programs that contribute to the refinement of students' motor skills, coordination, balance, and endurance have the potential to enhance their self-confidence and kindle intrinsic motivation.

However, lack of motivation is a common problem among students (Gusdernawati, et al., 2021). This can affect various aspects of their lives, including academic achievement, participation in extracurricular activities, and engagement in learning. Students in Malaysia may also experience a lack of motivation in physical education. Several factors contribute to the occurrence of this lack of motivation among students. One factor is the unclear goals and expectations in physical education. Students may lack clear objectives or understanding of the expectations set by themselves. Without clear goals, they are

likely to lose direction and be less motivated to achieve desired outcomes in physical education.

Furthermore, students may lack interest in sports due to a lack of motivation (Mudzakir, 2020). A considerable number of students harbor a perception that they lack proficiency in sports, leading to apprehension about potential ridicule from their peers. Additionally, some students may feel they do not have enough time to participate in sports due to academic or extracurricular commitments. Without sufficient motivation, it becomes challenging for students to generate interest in sports (Kapti & Winarno, 2022). Limited resources and opportunities can also contribute to a decline in students' interest in sports. Many schools may lack adequate facilities or equipment to support robust sports programs. Additionally, some students may lack access to transportation or face financial constraints to participate in sports outside of school. Without these resources and opportunities, it becomes challenging for students to develop an interest in sports.

Moreover, some students express that competitive activities are enjoyable in physical education, but many students have concerns. In general, scorekeeping is considered to make Physical Education less enjoyable (Beni, Fletcher, & Chróinín, 2019), as the competition among students prioritizes winning, leaving less talented or skilled students behind (Watkins, Aitken, & Roos, 2019). Conversely, motivated students explain that they do not like competitions during Physical Education because it highlights their lack of abilities. Competitive activities involve winners and losers or overcoming student rankings. Those who are less skilled will be left behind or required to showcase their lack of skills to the class, both leading to negative emotional outcomes and reducing motivation to learn.

1.1. Research Objectives

The primary objectives of this research are to enhance intrinsic motivation and increase student involvement in Physical Education among primary school students, aiming to foster a more engaging and participatory environment that promotes lifelong physical activity and overall well-being.

2. Methodology

This study employs a quantitative research design to assess intrinsic motivation and its impact on students' participation in physical education. Quantitative methods enable the systematic collection and statistical analysis of numerical data to identify patterns, relationships, and trends. The sample size of 30 students was chosen based on the availability of participants, feasibility within the study's timeframe, and available resources for data collection and analysis. This sample size allows for meaningful statistical inferences while maintaining manageability in terms of data handling. The study uses a purposive sampling technique, selecting participants who meet specific criteria relevant to the research objectives. In this case, the sample comprises 30 Year 6 students from different classes within one primary school in Malaysia, all of whom participate in physical education. Purposive sampling ensures the sample is representative of the population being studied, providing relevant data for the research. The specific location of the school has been kept confidential to protect the privacy and confidentiality of the participants, adhering to ethical research standards. Maintaining

anonymity ensures that the students and the institution are not identifiable, thus safeguarding participants' rights.

2.1. Data Collection Method

A multidimensional measurement tool designed for assessing intrinsic motivation includes a total of 45 items to evaluate seven dimensions, as outlined by Heindl (2020). These tools were chosen for their reliability and validity in measuring intrinsic motivation and related constructs in the context of physical education. By employing these methods and tools, the study aims to provide a comprehensive understanding of how intrinsic motivation influences students' engagement and participation in physical education activities. Various versions of the Intrinsic Motivation Inventory (IMI) have been employed in previous research, each featuring different numbers of items, subscales, and associations with various activities. The standard version, consisting of 22 items, has been widely used in various studies and includes four subscales: interest or enjoyment, perceived competence, perceived choice, and pressure/tension. Additionally, there is an interpersonal questionnaire version with 29 items that encompasses five subscales: relatedness, interest or enjoyment, perceived choice, pressure/tension, and effort (Taub, et al., 2020).

The Intrinsic Motivation Inventory serves as a comprehensive measurement tool designed to assess the subjective experiences of individuals participating in specific activities within laboratory experiments, as outlined by Suzuki (2019). Widely utilized in studies investigating intrinsic motivation and self-regulation, this instrument measures various dimensions, including interest/enjoyment, perceived competence, effort, value/usefulness, perceived pressure and tension, and perceived choice during the performance of assigned tasks, resulting in six distinct subscale scores. Notably, a recent addition includes a seventh subscale related to experiences of relatedness, although its reliability is still being examined. The interest or enjoyment subscale is recognized as a self-reported indicator of intrinsic motivation.

2.2. Data Analysis

Descriptive statistical analysis is a crucial initial step in statistical research. The purpose of descriptive statistical analysis is to provide a clear and concise overview of the collected data. This method is used to summarize and describe the collected data and its distribution (Martias, 2021). Data is analyzed using Statistical Package for Social Science (SPSS) Version 21.

3. Results

To carry out this research, Intrinsic Motivation Inventory (IMI) are divided into 4 major categories (Interest, Tension, Perceived Choice, and Perceived Competence). The pre-test results for perceived choice and perceived competence before intrinsic motivation are displayed in Table 1. The data shows varied responses from the participants across different statements. For item 3, "I felt that I chose to do the task on my own," 43.3% of respondents agreed (PA), while 40.0% disagreed (DA), indicating a mixed perception of autonomy in task selection. This suggests that less than half of the participants felt they had autonomy in choosing the task. Item 4, "I believe I am proficient at this task," revealed that 56.7% of participants disagreed (SDA), while 33.3% agreed (PA). This indicates that a significant majority of the participants did not feel proficient in the task,

reflecting a lower perceived competence. In item 7, "I think I performed well in this activity compared to other students," 60.0% of respondents agreed (PA), and 40.0% disagreed (DA), showing that more than half of the participants felt they performed well compared to their peers. For item 11, "I didn't really have a choice about doing the task," a substantial 73.3% of respondents disagreed (SDA), indicating they felt compelled to do the task without a choice. In item 15, "I felt like I was following my own desires while working on the task," 73.3% disagreed (SDA), and only 16.7% agreed (PA), suggesting that most participants did not feel they were following their own desires. Item 16, "I felt skilled at this task," showed 53.3% agreed (PA) and 46.7% disagreed (DA), indicating a slight majority felt skilled at the task. For item 21, "I did the task because I had no alternative," 80.0% agreed (PA), indicating a strong feeling of compulsion. Lastly, item 22, "After working on this task for a while, I felt capable," showed an even split, with 50.0% agreeing (PA) and 50.0% disagreeing (DA). These findings suggest that while some participants felt competent and skilled, many did not feel autonomous or self-motivated in their task participation.

Table 1: Pre-Test of Perceived Choice and Perceived Competence before Intrinsic Motivation

		VSDA	SDA	DA	PA	A	SA	VSA
3	I felt that I chose to do the task on my own.		5 16.7%	12 40.0%	13 43.3%			
4	I believe I am proficient at this task.		3 10.0%	17 56.7%	10 33.3%			
7	I think I performed well in this activity compared to other students.			12 40.0%	18 60.0%			
11	I didn't really have a choice about doing the task.				22 73.3%	8 26.7%		
15	I felt like I was following my own desires while working on the task.			3 10.0%	22 73.3%	5 16.7%		
16	I felt skilled at this task.			14 46.7%	16 53.3%			
21	I did the task because I had no alternative.			6 20.0%	24 80.0%			
22	After working on this task for a while, I felt capable.			15 50.0%	15 50.0%			

The post-test results in Table 2 show a positive shift in students' perceptions after the intrinsic motivation intervention. For item 3, "I felt that I chose to do the task on my own," 56.3% strongly agreed (SA) and 46.7% agreed (PA), indicating increased perceived autonomy. Item 4, "I believe I am proficient at this task," had 66.7% strongly agreeing (SA) and 33.3% agreeing (PA), reflecting improved perceived competence. In item 7, "I think I performed well in this activity compared to other students," 63.3% strongly agreed (SA) and 33.3% agreed (PA), showing better perceived performance

relative to peers. For item 11, "I didn't really have a choice about doing the task," 80.0% strongly disagreed (SDA), indicating strong autonomy. In item 15, "I felt like I was following my own desires while working on the task," 60.0% strongly agreed (SA) and 33.3% agreed (PA), suggesting increased intrinsic motivation. Item 16, "I felt skilled at this task," had 56.7% strongly agreeing (SA) and 43.3% agreeing (PA), indicating better perceived skill. For item 21, "I did the task because I had no alternative," 90.0% strongly disagreed (SDA), showing reduced feelings of compulsion. Lastly, item 22, "After working on this task for a while, I felt capable," had 56.7% strongly agreeing (SA) and 43.3% agreeing (PA), indicating increased capability. Overall, the findings suggest that the intervention significantly enhanced students' perceptions of autonomy, competence, and intrinsic motivation in their task participation.

Table 2: Post Test of Perceived Choice and Perceived Competence after Intrinsic Motivation

		VSDA	SDA	DA	PA	A	SA	VSA
3	I felt that I chose to do the task on my own.						14 46.7%	16 56.3%
4	I believe I am proficient at this task.						10 33.3%	20 66.7%
7	I think I performed well in this activity compared to other students.					1 3.3%	10 33.3%	19 63.3%
11	I didn't really have a choice about doing the task.	24 80.0%	6 20.0%					
15	I felt like I was following my own desires while working on the task.					2 6.7%	10 33.3%	18 60.0%
16	I felt skilled at this task.						13 43.3%	17 56.7%
21	I did the task because I had no alternative.	27 90.0%	3 10.0%					
22	After working on this task for a while, I felt capable.						13 43.3%	17 56.7%

The pre-test results for interest and tension after intrinsic motivation are shown in Table 3. The data reveals a range of responses regarding students' engagement and emotional state during the task. For item 1, "As I worked on the task, I was reflecting on how much I enjoyed it," 63.3% of respondents agreed (PA) and 36.7% disagreed (DA), indicating a majority enjoyed the task. Item 2, "I didn't feel nervous at all about doing the task," had 60.0% agreeing (PA) and 40.0% disagreeing (DA), showing a relatively calm disposition among students. In item 5, "I found the task to be very engaging," 53.3% disagreed (DA) and 33.3% agreed (PA), suggesting that many students did not find the task engaging. For item 6, "I felt tense while completing the task," 76.7% agreed (PA), indicating a high level of tension among students. Item 8, "Doing the task was fun," had

53.3% agreeing (PA) and 46.7% disagreeing (DA), reflecting mixed perceptions of fun. In item 9, "I felt relaxed while doing the task," 50.0% agreed (PA) and 40.0% disagreed (DA), suggesting a moderate level of relaxation. Item 10, "I enjoyed doing the task very much," showed 66.7% agreeing (PA) and 26.7% disagreeing (DA), indicating general enjoyment. For item 12, "I am satisfied with my performance at this task," 70.0% strongly disagreed (SDA), indicating a high level of dissatisfaction. Item 13, "I felt anxious while working on the task," 83.3% strongly disagreed (SDA), showing a significant amount of anxiety. In item 14, "I considered the task to be very boring," 86.7% strongly disagreed (SDA), indicating the task was not perceived as boring. Item 17, "I found the task to be highly interesting," had 73.3% agreeing (PA) and 26.7% disagreeing (DA), showing a positive interest. Item 18, "I felt pressured while completing the task," 70.0% strongly disagreed (SDA), indicating a high level of pressure. For item 19, "I felt obligated to do the task," 56.7% disagreed (DA) and 33.3% agreed (PA), suggesting a moderate sense of obligation. Lastly, item 20, "I would describe the task as very enjoyable," showed 60.0% agreeing (PA) and 40.0% disagreeing (DA), indicating mixed feelings about enjoyment. Overall, the findings suggest varied levels of engagement, enjoyment, and tension among students during the task.

Table 3: Pre-Test of Interest and Tension after Intrinsic Motivation

		VSDA	SDA	DA	PA	A	SA	VSA
1	As I worked on the task, I was reflecting on how much I enjoyed it.			11 (36.7%)	19 (63.3%)			
2	I didn't feel nervous at all about doing the task.			12 (40.0%)	18 (60.0%)			
5	I found the task to be very engaging.		4 (13.3%)	16 (53.3%)	10 (33.3)			
6	I felt tense while completing the task.				7 (23.3%)	23 (76.7%)		
8	Doing the task was fun.			14 (46.7%)	16 (53.3%)			
9	I felt relaxed while doing the task.		3 (10.0%)	12 (40.0%)	15 (50.0%)			
10	I enjoyed doing the task very much			8 (26.7%)	20 (66.7%)	2 (6.7%)		
12	I am satisfied with my performance at this task.			21 (70.0%)	9 (30.0%)			
13	I felt anxious while working on the task.				25 (83.3%)	5 (16.7%)		
14	I considered the task to be very boring.				26 (86.7%)	4 (13.3%)		

17	I found the task to be highly interesting.	8 (26.7%)	22 (73.3%)	
18	I felt pressured while completing the task.	21 (70.0%)	9 (30.0%)	
19	I felt obligated to do the task.	3 (10.0%)	17 (56.7%)	10 (33.3%)
20	I would describe the task as very enjoyable.	18 (60.0%)	12 (40.0%)	

The post-test results for interest and tension after intrinsic motivation are shown in Table 4. The data reveals notable changes in students' engagement and emotional state during the task following the intrinsic motivation intervention. For item 1, "As I worked on the task, I was reflecting on how much I enjoyed it," 60.0% agreed (PA) and 40.0% strongly agreed (SA), indicating a high level of enjoyment. Item 2, "I didn't feel nervous at all about doing the task," had 56.7% strongly agreeing (SA) and 43.3% agreeing (PA), reflecting reduced nervousness.

Table 4: Post Test of Interest and Tension after Intrinsic Motivation

		VSDA	SDA	DA	PA	A	SA	VSA
1	As I worked on the task, I was reflecting on how much I enjoyed it.						18 (60.0%)	12 (40.0%)
2	I didn't feel nervous at all about doing the task.						13 (43.3%)	17 (56.7%)
5	I found the task to be very engaging.						12 (40.0%)	18 (60.0%)
6	I felt tense while completing the task.	25 (83.3%)	5 (16.7%)					
8	Doing the task was fun.						13 (43.3%)	17 (56.7%)
9	I felt relaxed while doing the task.						15 (50.0%)	15 (50.0%)
10	I enjoyed doing the task very much						14 (46.7%)	16 (53.3%)
12	I am satisfied with my performance at this task.						12 (40.0%	18 (60.0%)

				)	
13	I felt anxious while working on the task.	27 (90.0%)	3 (10.0%)		
14	I considered the task to be very boring.	26 (86.7%)	4 (13.3%)		
17	I found the task to be highly interesting.			13 (43.3%)	17 (56.7%)
18	I felt pressured while completing the task.	27 (90.0%)	3 (10.0%)		
19	I felt obligated to do the task.	25 (83.3%)	5 (16.7%)		
20	I would describe the task as very enjoyable.			12 (40.0%)	18 (60.0%)

In item 5, "I found the task to be very engaging," 60.0% strongly agreed (SA) and 40.0% agreed (PA), suggesting increased engagement. For item 6, "I felt tense while completing the task," 83.3% strongly disagreed (SDA) and 16.7% disagreed (DA), showing reduced tension. Item 8, "Doing the task was fun," had 56.7% strongly agreeing (SA) and 43.3% agreeing (PA), reflecting increased fun. In item 9, "I felt relaxed while doing the task," 50.0% strongly agreed (SA) and 50.0% agreed (PA), indicating a balanced sense of relaxation. Item 10, "I enjoyed doing the task very much," showed 53.3% strongly agreeing (SA) and 46.7% agreeing (PA), indicating general enjoyment. For item 12, "I am satisfied with my performance at this task," 60.0% strongly agreed (SA) and 40.0% agreed (PA), showing increased satisfaction. Item 13, "I felt anxious while working on the task," 90.0% strongly disagreed (SDA) and 10.0% disagreed (DA), indicating a significant reduction in anxiety. In item 14, "I considered the task to be very boring," 86.7% strongly disagreed (SDA) and 13.3% disagreed (DA), suggesting reduced boredom. Item 17, "I found the task to be highly interesting," had 56.7% strongly agreeing (SA) and 43.3% agreeing (PA), indicating a high level of interest. Item 18, "I felt pressured while completing the task," 90.0% strongly disagreed (SDA) and 10.0% disagreed (DA), reflecting reduced pressure. For item 19, "I felt obligated to do the task," 83.3% strongly disagreed (SDA) and 16.7% disagreed (DA), suggesting a reduced sense of obligation. Lastly, item 20, "I would describe the task as very enjoyable," showed 60.0% strongly agreeing (SA) and 40.0% agreeing (PA), indicating a high level of enjoyment. Overall, the findings suggest that the intrinsic motivation intervention significantly enhanced students' perceptions of interest, reduced tension, and improved their overall engagement and enjoyment in the task.

4. Discussion

Intrinsic motivation plays a crucial role in influencing the engagement, participation, and overall experience of students in physical education, particularly in the context of primary schools. Intrinsic motivation fosters a genuine interest in physical activities and the learning process associated with physical education (Fishbach & Woolley, 2022). Students who are intrinsically motivated find joy in participating in various physical exercises, sports, and games. Additionally, intrinsic motivation is frequently associated with a sense of autonomy and choice. When students perceive that they have control over their activities and can make choices aligned with their preferences, they are more inclined to be intrinsically motivated to participate in physical education.

In addition, intrinsically motivated students are naturally curious and inclined to explore different aspects of physical activities (Abah, et al., 2022). They may be more open to trying new sports, exercises, or movement patterns, leading to a more comprehensive and enjoyable physical education experience. Intrinsic motivation encourages students to persevere and invest effort in their physical activities. When the motivation comes from within, students are more likely to overcome challenges, set personal goals, and work diligently to improve their physical skills. Moreover, intrinsic motivation plays a key role in fostering positive attitudes toward physical activity. Students who possess intrinsic motivation are more prone to perceive physical education as a meaningful and enjoyable component of their overall education.

Therefore, teachers and policymakers have a crucial role in nurturing intrinsic motivation in physical education. This can be achieved by designing curricula that are engaging and student-centered, offering opportunities for autonomy, and acknowledging individual achievements. Establishing a positive and supportive environment is instrumental in further enhancing the intrinsic motivation of primary school students in the field of physical education (Faraz, et al., 2021).

Physical education in schools goes beyond merely developing physical prowess; it also aims to cultivate a lifelong love for physical activity. Intrinsic motivation, characterized by an internal desire and drive to engage in activities for personal satisfaction, plays a pivotal role in enhancing students' participation in physical education (Chen et al., 2020).

Intrinsic motivation fuels a natural interest and enjoyment in physical activities. Students driven by an internal desire for participation are more likely to actively engage in various exercises, sports, and games, finding pleasure in the process. The sense of autonomy provided by intrinsic motivation allows students to take ownership of their physical education journey (Alamri, et al., 2020). When students feel empowered to make choices regarding their activities, they become more actively involved, contributing to a sense of personal investment. Intrinsic motivation propels students to set personal goals and strive for achievement. The aspiration for self-improvement and achievement serves as a motivating factor for students to actively engage in physical education, promoting a mindset centered on ongoing progress.

Also, intrinsically motivated students approach challenges with a positive mindset. Rather than viewing difficulties as obstacles, they see them as opportunities for growth. This resilience encourages active involvement in physical education, even when faced with more demanding activities. Intrinsic motivation sparks curiosity and a willingness

to explore various facets of physical activities. Students actively seek new experiences and challenges, leading to increased involvement in diverse physical education offerings (Lynch & Sargent, 2020). By actively engaging in physical education due to intrinsic motivation, students positively impact their emotional well-being. The satisfaction and joy derived from participation contribute to enhanced mental health, creating a positive feedback loop that further motivates continued involvement.

5. Conclusion

Intrinsic motivation emerges as a potent force in increasing students' involvement in physical education. Through the cultivation of interest, autonomy, and a positive mindset, teachers can create an environment that motivates students to actively participate and invest in their physical well-being (Aithal & Aithal, 2023). Recognizing the pivotal role of intrinsic motivation in shaping lifelong attitudes towards physical activity, schools and teachers should strive to integrate strategies that fuel this internal drive, ultimately fostering a generation of individuals who not only excel in physical education but also carry a deep-seated passion for an active and healthy lifestyle.

Ethics Approval and Consent to Participate

This study, titled "Intrinsic Motivation to Increase the Involvement of Students in Physical Education," aims to explore and enhance the intrinsic motivation of students participating in physical education classes. The research is designed to adhere to ethical standards and guidelines to ensure the well-being and rights of all participants are protected. All procedures in this study involving human participants were carried out in compliance with the ethical standards of the institutional research committee. Informed consent was obtained from all participants in accordance with the Declaration of Helsinki.

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Conflict of Interest

The researcher declare no conflict of interest regarding the publication of this article. All viewpoints and conclusions expressed are solely those of the authors and were not influenced by any external organizations or individuals. There are no financial or personal relationships that could have inappropriately influenced the research conducted.

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