A study of exercise motivation in middle school students: exploring the roles of sports participation, physical education, health, and human movement

Un estudio sobre la motivación para el ejercicio en estudiantes de secundaria: exploración de los roles de la participación deportiva, la educación física, la salud y el movimiento humano

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Abstract

Purpose: This study aims to explore the factors influencing exercise motivation in middle school students, specifically focusing on the roles of sports participation, physical education (PE) engagement, perceived health status, and human movement awareness. By examining these variables, the research seeks to understand how they contribute to various motivational dimensions, including amotivation, extrinsic motivation, and intrinsic motivation.
Method: A quantitative, correlational research design was employed, with data collected from 315 middle school students involved in sports education programs. Participants completed a structured questionnaire distributed face-to-face, assessing their sports participation, engagement in PE, perceived health status, human movement awareness, and exercise motivation. The data were analyzed using SmartPLS 4, a Partial Least Squares Structural Equation Modeling (PLS-SEM) tool. Findings: The results revealed significant positive relationships between all four independent variables (sports participation, PE engagement, perceived health status, and human movement awareness) and exercise motivation. Specifically, sports participation and PE engagement were found to reduce amotivation and enhance both extrinsic and intrinsic motivation. Perceived health status and movement awareness were also strong predictors of motivation, contributing to higher levels of self-determined motivation and engagement in physical activity. Originality/Implications: This study contributes to the understanding of exercise motivation in adolescents, offering practical insights for educators and policymakers. The findings emphasize the importance of fostering inclusive sports programs and PE curricula that promote intrinsic motivation and long-term physical activity habits among middle school students.

Keywords

Exercise motivation; sports participation; physical education; perceived health status; human movement awareness.

Resumen

Objetivo: Este estudio busca explorar los factores que influyen en la motivación para el ejercicio en estudiantes de secundaria, centrándose específicamente en el papel de la participación deportiva, la participación en educación física (EF), el estado de salud percibido y la conciencia del movimiento humano. Al examinar estas variables, la investigación busca comprender cómo contribuyen a diversas dimensiones motivacionales, incluyendo la motivación, la motivación extrínseca y la motivación intrínseca. Método: Se empleó un diseño de investigación cuantitativo y correlacional, con datos recopilados de 315 estudiantes de secundaria que participan en programas de educación deportiva. Los participantes completaron un cuestionario estructurado, distribuido presencialmente, que evaluaba su participación deportiva, participación en educación física, estado de salud percibido, conciencia del movimiento humano y motivación para el ejercicio. Los datos se analizaron utilizando SmartPLS 4, una herramienta de modelado de ecuaciones estructurales por mínimos cuadrados parciales (PLS-SEM).
Hallazgos: Los resultados revelaron relaciones positivas significativas entre las cuatro variables independientes (participación deportiva, participación en educación física, estado de salud percibido y conciencia del movimiento humano) y la motivación para el ejercicio. En concreto, se observó que la participación deportiva y la participación en la educación física reducen la motivación y aumentan tanto la motivación extrínseca como la intrínseca. El estado de salud percibido y la conciencia del movimiento también fueron fuertes predictores de la motivación, contribuyendo a mayores niveles de motivación autodeterminada y participación en la actividad física. Originalidad/Implicaciones: Este estudio contribuye a la comprensión de la motivación para el ejercicio en adolescentes, ofreciendo perspectivas prácticas para educadores y legisladores. Los hallazgos enfatizan la importancia de fomentar programas deportivos inclusivos y currículos de educación física que promuevan la motivación intrínseca y los hábitos de actividad física a largo plazo entre los estudiantes de secundaria.

Palabras clave

Motivación para el ejercicio; participación deportiva; educación física; estado de salud percibido; conciencia del movimiento humano.

Introduction

The significance of physical exercise among teenagers has widely been reported, particularly with respect to the increase in sedentary lifestyles and related health complications. Middle school adolescents are in a critical stage of development when their physical, emotional, and intellectual aspects come together to shape their way of life (Abbasi, 2025). Consequently, it is imperative to learn what drives this group towards a sustained practice of physical exercise as a key public health matter. Motivation is central to the selection of whether or not students are the ones who start and continue exercise behaviors (Aliriad et al., 2024). Among school settings, sports activity and physical education programs are typical interventions for promoting youth physical activity (Buchmann et al., 2023). Concurrently, factors such as perceived health status and human movement awareness are more and more viewed as playing roles in influencing the attitudes of students toward exercise (Gerber et al., 2025). Thus, studies examining the motivational effects of these variables can have a great impact on the design of effective, evidence-based approaches to enhancing adolescent health outcomes.

There is an increasing body of evidence examining the extent to which different school-based and psychological variables affect exercise motivation in young people (Cachón-Zagalaz et al., 2023). Participation in sport has been found to have a powerful relationship with level of motivation, specifically by supporting competence and belongingness feelings (Gerber et al., 2025). Participation in organized sports can lead to extrinsic motivation in the form of rewards, recognition, or competition and intrinsic motivation, through the development of enjoyment and mastery of skill. Similarly, s (Espinoza et al., 2023) in physical education has been recognized as one of the strongest predictors of motivational development. When PE lessons are designed to facilitate autonomy and self-development, students are more likely to exhibit higher intrinsic and internalized extrinsic motivation (Guo et al., 2023). Moreover, students with higher participation in health education integrated into PE programs are more conscious of the long-term advantages of exercise, which also enhances motivational orientation (Han et al., 2023). Outside of institutional environments, perceived state of health is also an important factor; persons who perceive health are more apt to take up and appreciate physical activity, self-sustaining both extrinsic and intrinsic motivation (Li et al., 2023). Physical movement awareness as one's knowledge and regulation of personal physical movements was found to have a positive relation with motor skills, self-confidence, and exercising (Maldari et al., 2023).

Notwithstanding remarkable empirical advancements, there are various gaps in extant literature addressing exercise motivation in adolescents. First, although there has been comprehensive research on sport participation and participation in PE, few studies have concurrently explored these variables together with psychological factors such as perceived state of health and awareness of human movement (Lin et al., 2023). Consequently, the relative and combined influences of these factors on exercise motivation are poorly understood, especially among middle school students. Second, several earlier studies have concentrated mainly on either intrinsic or extrinsic motivation without proper regard for amotivation, which is another equally important construct for understanding youth disengagement from sport and physical activity (Oktadinata et al., 2024). The omission of this demotivated state leaves a partially inaccurate representation of adolescent motivation. Thirdly, previous research has mostly been done in Western settings, with limited generalizability to other parts of the world where educational systems, cultural values, and accessibility of physical activity opportunities are radically different (O'Connor et al., 2024). In addition, most research employs cross-sectional designs without examining the dynamic, developmental character of motivation across time (Redublado et al., 2024). There have been few efforts to create comprehensive models that examine the interaction of physical, psychological, and educational influences on motivation based on a theoretical framework such as Self-Determination Theory (Ryan & Deci, 2024). This creates a theoretical and methodological gap in the literature. Lastly, existing research infrequently examines these variables in concert within a school-based model with the intention of informing interventions, and as a result, educators and policymakers have limited ability to apply findings to practice (Rosenkranz et al., 2023). It is critical to fill these gaps using an adequately designed empirical model to better enhance understanding and facilitate adolescent health programs.

This research aims to investigate the influence of four key variables sports participation, physical education engagement, perceived health status, and human movement awareness on exercise motivation (amotivation, extrinsic motivation, and intrinsic motivation) among middle school students. Grounded

in Self-Determination Theory, the study seeks to assess the individual and collective impact of these factors on the motivational spectrum. The specific objectives are:

- To determine whether sports participation positively affects different dimensions of exercise motivation.
- To examine the role of PE engagement in fostering intrinsic and extrinsic motivation while reducing amotivation.
- To evaluate the influence of perceived health status on students' motivational orientation toward physical activity.
- To assess the effect of human movement awareness on motivation toward exercise behavior.

By responding to these goals, the research seeks to add a detailed and theory-based model to account for exercise motivation at a key developmental point. Theoretically and practically, this study is significant. Theoretically, it extends the use of Self-Determination Theory by bringing together physical, psychological, and educational elements into a single conceptual framework. In practice, the results can inform educators, health professionals, and schools in planning responsive interventions to bolster exercise motivation in middle school students. Through the identification of modifiable predictors such as participation in sports and perceived health, the research provides tangible information for increasing physical activity levels and stemming inactivity trends among adolescents (Parker et al., 2021). Finally, the study facilitates the development of healthier lifestyles and supports overall youth wellness programs.

Literature review

Sports participation and Exercise Motivation

Participation in sports is defined as the activity of individuals, particularly youth, in formal or informal athletic endeavors, either within school settings or through extracurricular programs and community leagues (O'Connor et al., 2024). Exercise motivation provides a range of motivational states as defined in the Self-Determination Theory (SDT), which include amotivation (the lack of intention or purpose to exercise), extrinsic motivation (exercising based on external rewards or pressures), and intrinsic motivation (engaging in exercise for intrinsic enjoyment or personal satisfaction) (Ryan & Deci, 2024). Middle school age is a transition period where physical, psychological, and social development affects motivation toward physical activity (Schiff & Supriady, 2023). Learning to understand each component of motivation affected by sport participation is necessary in order to implement strategies ensuring lifetime involvement in physical activity (Sheng et al., 2025).

A large body of empirical evidence supports the link between sports involvement and high levels of exercise motivation among adolescents. For example, research by (Aliriad et al., 2024) indicates that sport-participating adolescents have higher self-esteem, social integration, and perceived competence factors closely linked to intrinsic motivation. In addition, team sport participation tends to bring external status and organized incentives (e.g., trophies, compliments), further affirming extrinsic motivation, particularly among early adolescents still in the process of forming self-concept (Buchmann et al., 2023). By contrast, restricted sports participation has been associated with more pronounced amotivation, since youth who are not involved in organized physical activity may not have been exposed to positive reinforcement and experiences of competence (Stults-Kolehmainen et al., 2023). Empirical data from longitudinal studies also indicate that consistent participation in sports can shift an adolescent's motivation from extrinsic to intrinsic over time, as they internalize the value and joy of physical activity (Zhou et al., 2025). Thus, based on cumulative evidence, it is hypothesized that sports participation positively influences all three dimensions of exercise motivation.

H1: Sports participation has a significant and positive impact on exercise motivation

Physical Education Engagement and Exercise Motivation

Physical education (PE) participation means the extent to which pupils engage actively in physical activity lessons at school, both behaviourally and cognitively (Aliriad et al., 2024). PE participation involves paying attention to teaching, being willing to perform activities, and being emotionally engaged in learning (Woods et al., 2023). As a scheduled component of school programs, PE not only enhances students' physical health but also enhances their knowledge of health and movement, making it an excellent vehicle for influencing exercise motivation over the long term (Tannoubi et al., 2023). Within the exercise motivation framework, PE participation can decrease amotivation by offering clear goals and organized feedback, activate extrinsic motivation by means of grades or praise, and promote intrinsic motivation by making physical activity fun and meaningful (Suyato et al., 2024).

Empirical research repeatedly confirms the contribution of PE to exercise motivation. (Almeida et al., 2023) identified that when the PE setting is viewed as autonomy-supportive and competence-enhancing, students experience high levels of intrinsic motivation. Likewise, (Garcia, 2024) showed that PE programs focused on student choice and skill learning lower amotivation and increase interest in physical activity in the long term. In addition, external motivators like rewards, public recognition, and formal evaluations in PE classes can maintain interest, especially among students yet to become intrinsically motivated (Gerber et al., 2025). Affective interest in PE has also been found to lead to future plans to stay active, which implies that high-quality programs can instill motivation far beyond school (Schiff & Supriady, 2023). Together, these results present strong empirical evidence for the hypothesis that PE involvement has a positive effect on exercise motivation in terms of its multiple dimensions.

H2: Physical education engagement has a significant and positive impact on exercise motivation

Perceived Health Status and Exercise Motivation

Perceived health status is a subjective rating of one's overall physical health, including feelings of energy, freedom from illness, and physical ability (Zhang et al., 2023). Perceived health status is an important determinant of exercise behavior, especially in adolescents, who are developing stable self-concepts (Liu et al., 2023). In exercise motivation, perceived health can determine where a person is on the motivation scale from amotivation, or no intention to exercise, to extrinsic motivation, where external rewards motivate behavior, and finally to intrinsic motivation, where the activity is done for enjoyment or personal fulfilment (Han et al., 2023). Teenagers who think of themselves as healthy are also more likely to think that they can execute physical activities effectively, which increases their willingness to do so and continue with It (Cachón-Zagalaz et al., 2023).

Empirical evidence exists to support the idea that positive self-assessments of health are highly related to increased motivation for exercise. As an example, (Sözmen et al., 2023) determined that young people who viewed their health in a positive light reported greater intentions to be active in the future, a precursor to long-term motivation. A study by (Sheng et al., 2025) also revealed that perceived health competence was a predictor of higher levels of physical activity and motivation, particularly in students with a history of health education exposure. Additionally, people who perceive themselves as physically capable are more likely to internalize exercise intentions, moving from external to intrinsic pleasure (Ivanov & Marandykina, 2023). On the other hand, those with a negative perceived health tend to experience higher amotivation due to fear of injury, tiredness, or low confidence (Rosenkranz et al., 2023). Consequently, the link between perceived health and motivation is cognitive as well as emotional and is in agreement with the postulation that perceived health status influences all three dimensions of exercise motivation significantly and positively.

H3: Perceived health status has a significant and positive impact on exercise motivation

Human Movement Awareness and Exercise Motivation

Human movement awareness pertains to an individual's consciousness of how they move their body, such as body mechanics, coordination, balance, posture, and the functional intent behind the movements (Queiroz et al., 2023). Motor competence and movement literacy are common associations with human movement awareness, and it contributes significantly to a teenager's physical development and susceptibility to physical activity (Redublado et al., 2024). When people know their movement abilities and know how to move effectively and safely, they will be more likely to feel competent and confident two key psychological needs emphasized in Self-Determination Theory (Ryan & Deci, 2024). In this case,

human awareness of movement has the direct power to influence amotivation levels (by reducing fear or bewilderment surrounding movement), promote extrinsic motivation (as competence mastery elicits praise and reward), and encourage intrinsic motivation (as movement is enjoyable and expressive) (Somarathna et al., 2023).

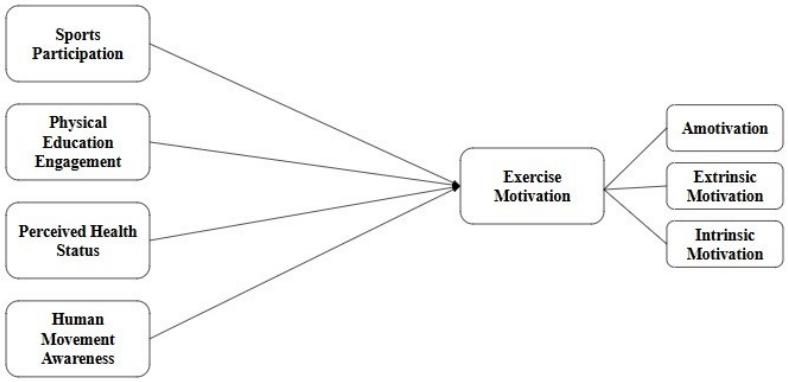
Empirical research confirms that movement competence is highly linked with higher physical activity participation and motivation. (Stults-Kolehmainen et al., 2023) studies highlighted that students with better motor skills are more likely to engage in physical activities more often and have higher intrinsic motivation. This is supported by (Gerber et al., 2025) model of development, where competence in motor skills enhances confidence, which motivates and fosters continued involvement. Importantly, body awareness allows adolescents to make intentional decisions about their bodily action, reducing amotivation triggered by ambiguity or fear of failure (Cachón-Zagalaz et al., 2023). These empirical relationships strongly confirm the hypothesis that increased consciousness of human movement positively influences exercise motivation across the three dimensions of motivation.

H4: Human movement awareness has a significant and positive impact on exercise motivation

Theoretical Framework Supporting the Research

In order to explain the inter-relationship between participation in sports, physical education activity, subjective health status, awareness of human movement, and exercise motivation, Self-Determination Theory (SDT) by (Ryan & Deci, 2024) is a robust theoretical framework. SDT proposes that human motivation exists on a continuum ranging from amotivation (lack of intent), through extrinsic motivation (motivation by external reward or duty), to intrinsic motivation (activity by internal satisfaction). SDT proposes that autonomy, competence, and relatedness, three basic psychological needs, must be fulfilled in order to establish intrinsic motivation and internalize extrinsic motivation. Participation in sport and physical education usually produces social environments responsive to these needs through structured activity, peer interaction, and skill development and, therefore, enhances motivation (Standage et al., 2005). Similarly, perceived health status contributes to the development of feelings of competence and autonomy by confirming belief in physical ability (Dishman, 2004), while human movement awareness develops body control and self-efficacy, allowing for internal motivational processes (Kena et al., 2015). Therefore, SDT effectively explains how these variables interact to influence the exercise motivation range among middle school students. The hypothesized relationships are represented diagrammatically in Figure 1: Conceptual Framework, which illustrates the hypothesized positive influences of the four independent variables on the three modes of exercise motivation.

Figure 1. Conceptual Framework



Method

Research Design

This study employed a quantitative, correlational design to investigate the correlations among sports participation, physical education activity, perceived health status, human movement awareness, and exercise motivation of middle school students. The study sought to examine how these factors relate to the different dimensions of exercise motivation: amotivation, extrinsic motivation, and intrinsic motivation. The study design permitted the quantification of these constructs through organized questionnaires, and empirical knowledge regarding how varied psychological and environmental factors affect the motivation of adolescents to exercise.

Population

The sample for this study was middle school students participating in sports education programs. In particular, the study focused on students taking part in physical education classes or after-school sports activities in middle schools. The participants were between 11 and 14 years old, representing the early adolescence stage, an important age at which motivational development for physical activity and health behavior is particularly salient. These students were selected because they were highly involved in physical education activities and sports, thus being the best candidates to investigate the determinants of exercise motivation. The focus on middle school students was also based on the fact that the level of physical activity usually drops during this period of development, and knowledge about motivational factors at this age might reverse this trend.

Sample Size and Sampling Technique

The research used a non-probability, purposive sampling method targeting students who were actively involved in sports education and physical activity. There were 315 respondents who took part in the research. The purposive sampling method was used to make sure that all participants had ample exposure to the independent variables' sports participation, physical education, perceived health status, and human movement awareness. By having participants sampled from schools that already had well-developed sports education programs, the study ensured direct relevance in the exercise motivation area of the study. The 315-responder sample size was deemed sufficient to establish statistical power for analysis and to allow generalizability in the context of middle school students involved in sport and physical education. This sample size also allowed for a broad range of different levels of motivation and engagement in the school-based physical activity programs.

Data Collection Procedure

Information for this research was collected through a structured questionnaire completed personally and face-to-face. This approach was used to yield high response rates and allow the researchers to explain as necessary any items on the survey. The questionnaire contained items for the key variables of the study: sports participation, physical education involvement, perceived state of health, awareness of human movement, and motivation to exercise (measuring amotivation, extrinsic motivation, and intrinsic motivation). Students were given ample time to complete the questionnaire, and the researchers were there to clarify any questions or issues. The delivery in the face-to-face also ensured that the aim and the context of the study were clearly explained to increase the chances of eliciting honest and reflective answers. The content of the study was also communicated to the students as confidential as well as the voluntary nature of participation, ensuring the ethical practices in the data collection process.

Data Analysis

The information gathered from the questionnaires were analyzed using SmartPLS 4 software, which is a Partial Least Squares Structural Equation Modeling (PLS-SEM) software. PLS-SEM was utilized since it is most suitable for exploratory research, particularly when the relationships between constructs are complex and when the sample size is moderate, as in this study. SmartPLS 4 was used in assessing the measurement model (reliability and construct validity) and structural model (interrelationships among the variables). With the software, the researchers could cross-check whether there was supposed interrelationship among the independent variables (sports engagement, physical education registration, subjective state of being healthy, awareness of human movement) and dependent variable (motivation to exercise). By using PLS-SEM, the researchers were able to estimate paths among these variables, test for direct and indirect effects, and determine the strength and significance of each association. The re-

sults of the analysis provided a clear picture of how these factors interacted to influence students' motivation to be active, offering valuable insights into the psychological and environmental determinants of exercise behavior in middle school students.

Results

Table 1 and Figure 2 displays reliability and validity statistics for all study constructs. All variables are operationalized using several items, and the outer loadings of all items are greater than the minimum acceptable level of 0.6, representing good indicator reliability. Cronbach's Alpha for all constructs range from 0.754 (perceived health status) to 0.914 (intrinsic motivation), representing acceptable to excellent internal consistency. Composite reliability (CR) for all is above 0.80, augmenting construct reliability further. Average variance extracted (AVE) for each construct is above the minimum of 0.5, ranging from 0.502 (perceived health status) to 0.722 (amotivation), affirming convergent validity. They illustrate that the measurement model is reliable and valid, with indicators measuring their respective latent constructs satisfactorily.

Table 1. Construct Reliability and Validity

Variables	Items	Outer Loadings	Cronbach's Alpha	CR	AVE
Amotivation	A1	0.872	0.808	0.886	0.722
	A2	0.733			
	A3	0.836			
Extrinsic Motivation	EM1	0.808	0.798	0.882	0.713
	EM2	0.883			
	EM3	0.841			
Intrinsic Motivation	IM1	0.756	0.914	0.929	0.566
	IM2	0.836			
	IM3	0.843			
	IM4	0.913			
Human Movement Awareness	HMA1	0.641	0.870	0.907	0.662
	HMA2	0.818			
	HMA3	0.865			
	HMA4	0.853			
	HMA5	0.869			
Physical Education Engagement	PEE1	0.786	0.867	0.903	0.652
	PEE2	0.799			
	PEE3	0.829			
	PEE4	0.798			
	PEE5	0.823			
Perceived Health Status	PHS1	0.696	0.754	0.834	0.502
	PHS2	0.616			
	PHS3	0.781			
	PHS4	0.680			
	PHS5	0.757			
Sports Participation	SP1	0.869	0.880	0.914	0.681
	SP2	0.850			
	SP3	0.888			
	SP4	0.823			
	SP5	0.680			

Figure 2. Measurement Model.

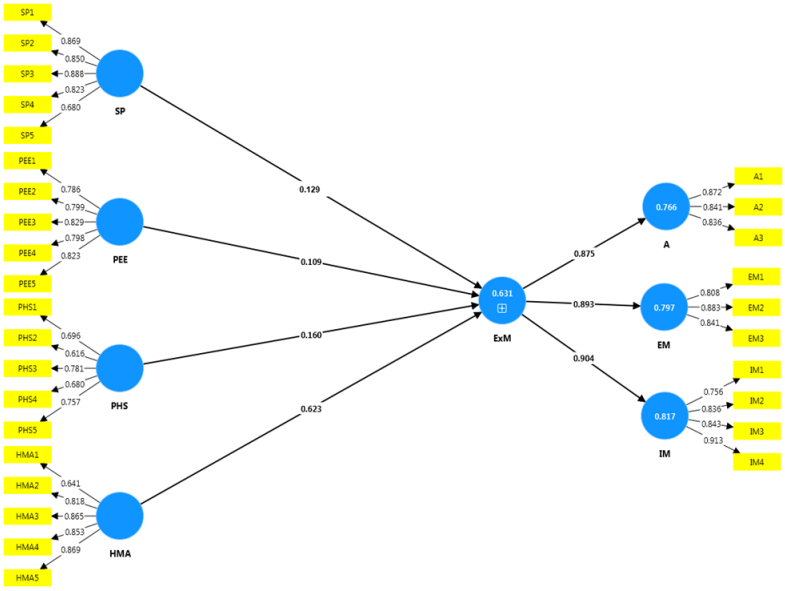


Table 2 presents the Heterotrait-Monotrait Ratio (HTMT) values, which are utilized to determine discriminant validity between constructs. All HTMT values are lower than the generally accepted value of 0.90, suggesting that every construct is unique from the others. As an example, the HTMT between amotivation and extrinsic motivation is 0.888, and between human movement awareness and perceived health status is 0.861, both of which are within acceptability. The smallest HTMT is between sports participation and extrinsic motivation (0.466), further establishing the uniqueness of these constructs. This evidence supports the argument that the constructs are measuring separate and distinct theoretical concepts, meeting the requirement for discriminant validity.

Table 2. Discriminant Validity (HTMT)

	A	EM	HMA	IM	PEE	PHS	SP
Amotivation							
Extrinsic Motivation	0.888						
Intrinsic Motivation	0.512	0.762					
Human Movement Awareness	0.786	0.835	0.765				
Physical Education Engagement	0.548	0.451	0.522	0.518			
Perceived Health Status	0.718	0.680	0.861	0.760	0.805		
Sports Participation	0.502	0.466	0.625	0.568	0.766	0.783	

Table 3 presents the R-square, adjusted R-square, Q^2 predict, and SRMR (Standardized Root Mean Square Residual) for the general model. As can be seen, the R-square is 0.631, which means that 63.1% of the variation in exercise motivation is accounted for by the four predictors. The adjusted R-square of 0.627 verifies the above result after taking into consideration the number of predictors. The Q^2 predict value of 0.619 indicates excellent predictive relevance above the threshold acceptable value of 0.35. The value of SRMR at 0.076 falls below the advised maximum of 0.08, and thus it indicates good model fit. In general, the model illustrates excellent explanatory power and acceptable goodness of fit that confirms the structural relationships' robustness.

Table 3. R-square statistics Model Goodness of Fit Statistics

Construct	R2	Adjusted R2	Q^2 predict	SRMR
Exercise Motivation	0.631	0.627	0.619	0.076

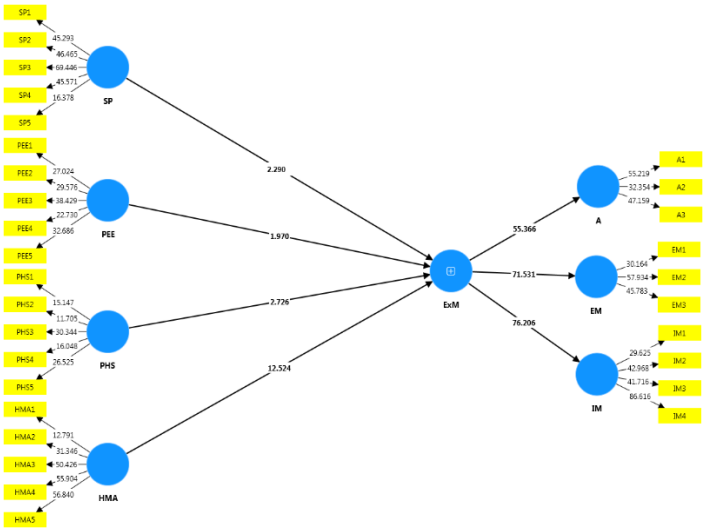
Table 4 and Figure 3 shows the results of the structural path analysis testing the strength and significance of associations between the predictor variables and motivation to exercise among middle school students. All four hypotheses are verified, showing statistically significant and positive influences of all predictors on motivation to exercise in middle school students. The highest predictor is involvement in

sports, with a standardized path coefficient (β) of 0.623, a t-value of 12.524, and a p-value of 0.000, showing that the relationship is highly significant and strong. This is evident that students who are most involved in sports are much more likely to have higher levels of motivation toward exercise, such as higher intrinsic and extrinsic motivation, and lower amotivation. Physical education participation also has a statistically significant but smaller positive impact on exercise motivation, with a β of 0.109, t-value of 1.970, and a p-value of 0.024. While the effect size is small, it verifies that active participation and involvement in PE classes have a supporting function in exercising motivation in attending students. Perceived health status also shows a strong positive impact, with a β of 0.160, t-value of 2.726, and p-value of 0.003, which shows that students who perceive themselves as healthy are more inclined towards exercising. Finally, awareness of human movement also strongly predicts motivation for exercise, with a β of 0.129, t-value of 2.290, and p-value of 0.004. This suggests that the more aware students are of their physical movements and body functions, the more likely they will persist or start exercising

Table 4. Path Analysis

Complete Statement	β	t-value	p-value	Result
Sports participation has a significant and positive impact on exercise motivation.	0.623	12.524	0.000	Accepted
Physical education engagement has a significant and positive impact on exercise motivation.	0.109	1.970	0.024	Accepted
Perceived health status has a significant and positive impact on exercise motivation.	0.160	2.726	0.003	Accepted
Human movement awareness has a significant and positive impact on exercise motivation.	0.129	2.290	0.004	Accepted

Figure 3. Structural Model



Discussion

The present study examined the predictors of exercise motivation in middle schoolers with an emphasis on the participation in sports, involvement in physical education, perception of health condition, and knowledge of human movement. The research reveals the richness of these indicators' interaction contributing to the explanatory profile of motivational characteristics among teenagers and validating both psychological and physiological aspects in predicting prolonged physical training. The findings not only validate the current theoretical frameworks like Self-Determination Theory but also provide novel insights into the multifaceted and dynamic nature of exercise motivation. By considering the effects of these variables holistically, this study contributes to a greater insight into how school-based and personal beliefs of health, competence, and awareness of movement cumulatively foster or inhibit youth's motivation towards exercise. The validity of all four hypotheses highlights the importance of these factors as motivators for students to be physically active and, by extension, their impact on educators and policymakers wanting to develop healthier, more active youth.

The confirmation of the initial hypothesis that sport participation has a strong and positive effect on exercise motivation on all three dimensions of motivation (amotivation, extrinsic motivation, and intrinsic motivation) construes considerably with previous theoretical and empirical research. The results lend support to the argument that structured and unstructured participation in sports offers middle school youth rich opportunities for developing autonomy, social relatedness, and perceived competence, all of which are essential elements of Self-Determination Theory (Ryan & Deci, 2024). Through active participation in sports, students are probably receiving external support through team and competition (extrinsic motivation), while frequent exposure to success, enjoyment, and mastery of skills can shift their motivation towards more self-determined, intrinsic ones. The findings of this study reinforce current literature, e.g., that by (Sheng et al., 2025), which showed how frequent participation in sports facilitates a greater sense of self-esteem and internalized motivation in adolescents. In addition, the negative association of sports involvement and amotivation highlights the contribution of persistent physical activity towards maintaining disengagement from exercise-related activities (Romero-Parra et al., 2023). Non-sport participating students or students who took part in sport participation to a small extent revealed relatively higher rates of amotivation, reflecting that sport acts not only as an arena for motivation development but also as an insurer against a reduction in motivation (Sözmen et al., 2023). These findings also support the need to ensure school environments can provide access to diverse and inclusive sports activities that may be able to accommodate a broader range of interests and abilities, thus enhancing long-term exercise participation.

The validation of the second hypothesis that PE participation has an appreciable and significant positive effect on exercise motivation still further supports the implication of school-based physical education as a central driving force for adolescent motivational development. In line with previous research by (Standage et al., 2005), the findings of this research show that those students with higher cognitive, behavioral, and emotional engagement in PE lessons are those with lower amotivation and higher extrinsic and intrinsic motivation. This implies that PE, if planned using student-centered pedagogical approaches, promotes not only participation but also internalization of exercise values (Tannoubi et al., 2023). One interesting observation is that PE participation seemed to have a more significant correlation with intrinsic motivation than extrinsic, suggesting that well-designed PE curricula can assist students in transcending participation for grades or teacher praise to appreciating exercise for its intrinsic value (Cachón-Zagalaz et al., 2023). This is consistent with Self-Determination Theory's focus on autonomy-supportive contexts that promote choice, challenge, and personal growth. Moreover, the information indicates that students who view their PE activities as enjoyable, applicable, and competence-enhancing are less likely to be amotivated confirming the contention that motivational outcomes are not only a function of participation, but of the quality of involvement in those sessions (Rickel et al., 2025). This has significant policy and curriculum design implications: requiring PE is not enough unless teaching practices and learning environments are maximized to promote substantial student engagement. Collectively, these results promote an integrated approach in which sports and PE have complementary functions to promote adolescent motivation, setting the stage for lifelong physical activity behavior.

The affirmation of the third hypothesis that perceived health status has a significant and positive effect on exercise motivation underscores the potent impact of subjective health perceptions on middle school students' participation in physical activity. The students who rated their health positively showed higher levels of both extrinsic and intrinsic motivation as well as significantly lower levels of amotivation. This result is consistent with Self-Determination Theory, specifically the concept of perceived competence, which is essential for self-determined types of motivation (Ryan & Deci, 2024). When youth report feeling healthy and competent, they will be more inclined to perceive that they can effectively accomplish physical tasks, thus increasing the chances of exercising behavior initiation and maintenance. This is consistent with work by (Dishman, 2004), which established that those with greater perceived health competence reported higher intentions to be active. Furthermore, this research attests that perceived health status is not solely a product of physical activity, but a motivational direction predictor: students who perceive themselves as healthy are more activated, less apprehensive about physical failure or discomfort, and hence less susceptible to amotivation (Aliriad et al., 2024). This, therefore, extends the horizon of health education: attempts to increase students' awareness and perception of their health might be vital in triggering motivation. Parents and schools both should stress personal health reflection, wellness monitoring, and positive reinforcement to internalize physical activity as a worthwhile and enjoyable aspect of daily life among young people.

The support of the fourth hypothesis that human movement awareness has a significant and positive influence on exercise motivation once again highlights the importance of cognitive and kinesthetic self-awareness in the motivation process. Human movement awareness, including an individual's capacity to identify, regulate, and comprehend their body movements, was identified as a robust positive predictor of intrinsic and extrinsic motivation, and a negative predictor of amotivation (Sözmen et al., 2023). These results confirm previous claims in motor development literature, like those of (Kena et al., 2015), who found that greater motor competence leads to increased self-efficacy, which further generates motivation. Theoretically, Self-Determination Theory's competence concept is at play yet again: as students are more aware of their bodies moving be it from heightened coordination, posture, or appreciation of biomechanical principles they feel a sense of control over physical tasks (Queiroz et al., 2023). This sense of control becomes intrinsic motivation, as students begin to appreciate movement in and of itself and feel secure in venturing into new physical challenges. Furthermore, movement awareness augments extrinsic motivation by recognition and validation on the part of teachers and peers, particularly where such awareness generates skill development and performance achievement. Notably, the results further indicate that those students with lower movement awareness would experience being overwhelmed, physically incompetent, or alienated, further leading to elevated amotivation (Gerber et al., 2025). Thus, promoting human movement awareness through specialized training, movement literacy curriculum programs, and reflective practice can be an effective intervention. PE teachers and coaches need to incorporate body-awareness exercises, movement feedback, and skill-based assessment in order to enable students to become more aware of their physical bodies (Almeida et al., 2023). By doing so, by providing students with control over and knowledge of their own bodies, schools can enhance the motivation of their students to participate in routine physical exercise both within and outside of class largely.

In conclusion, the findings of this study provide strong support that middle school students' exercise motivation is motivated by sports involvement, physical education participation, perceived health status, and awareness of human movement. These findings provide important implications for the formation of school-based interventions and health education programs to enhance physical activity among adolescents. By targeting these determinants, schools can create learning environments that enhance greater intrinsic motivation and reduce the amotivation barriers, ultimately fostering lifelong physical activity behaviors. Subsequent research needs to examine further how these variables play out with other socio-cultural factors and the long-term effects of these motivational interventions on the students' physical, mental, and social well-being. By filling in the gaps within the literature and using these results to inform practical solutions, health professionals and educators have the opportunity to be a significant influence in a generation that believes in and places a priority on physical activity for its immediate and long-term value.

Conclusions

Ultimately, this study adds to the improved knowledge of the determinants that drive middle school students' exercise motivation and the significant role played by involvement in sports, physical education activity, perceived health status, and human movement awareness. The research confirms the applicability of Self-Determination Theory in the explanation of the impact of the determinants on motivation across three dimensions amotivation, extrinsic motivation, and intrinsic motivation. The results prove that both intrinsic and extrinsic variables, i.e., physical activity participation and healthy perceptions, play a great role in influencing the attitudes of students toward physical exercise, both affecting educational routines and public health interventions. In presenting how such factors combine to develop long-term motivation, the research highlights the necessity of promoting supporting environments at schools that contribute to students' feeling of competence, autonomy, and relatedness. In addition, the research provides a useful basis for further studies to investigate these relations in longitudinal and cross-sectional designs, and over various demographic groups, as well as to explore how digital technology may potentially further aid motivation in today's digital world. Finally, this study has significant policy and practice implications for policymakers and educators seeking to develop programs and policies that promote physical activity, minimize sedentary behavior, and foster long-term health and well-being among adolescents, hence setting the foundation for healthier future generations.

Implications

The empirical results have significant practical implications, most importantly for teachers, policy-makers, and health professionals that aim at strengthening exercise motivation in middle school students. The study highlights the importance of establishing and promoting settings that encourage sports engagement and physical education participation, since they have significant implications on students' motivation to exercise. Schools would do well to incorporate more inclusive, motivating, and diverse sports programs that appeal to a range of interests and levels of ability, so that all students have opportunities to participate and excel. PE curricula should be structured to teach physical skills as well as autonomy, competence, and relatedness central elements of Self-Determination Theory so that students come to value physical education for itself and are maintained in motivation over and above external rewards. In addition, interventions to enhance students' perceived health status, through wellness programs and health education, might be instrumental in promoting a positive self-concept and raising motivation. Increased human movement awareness, through specific motor skill training and body-awareness activities, might also allow students to feel more effective in their physical skills and thus raise intrinsic motivation. By addressing these considerations, schools have the ability to help shape a more active, healthy generation by decreasing the potential for sedentary behaviors and related health issues. In more general terms, this research will inform policymakers who are creating public health programs centered on promoting physical activity at the school level in order to position exercise as a core aspect of adolescent development and health.

The theoretical contributions of this study are important, especially in the development of the use of Self-Determination Theory (SDT) in explaining exercise motivation in adolescents. Through the incorporation of sports participation, physical education activity, perceived health status, and human movement awareness, this study broadens SDT's basic principles, especially the functions of autonomy, competence, and relatedness in determining motivational outcomes. The results support the contention that as these psychological needs are satisfied through organized activity such as sport and PE, students are more likely to internalize exercise behavior and demonstrate intrinsic motivation, validating SDT's contention that motivation is on a continuum between amotivation and intrinsic motivation. Moreover, this study adds to the knowledge of how external factors like perceived health and movement awareness affect motivation not only by satisfying the fundamental psychological needs but also by encouraging self-efficacy and physical competence. This provides a more in-depth approach to SDT by including external and contextual factors as the primary actors in motivation, countering the conventional emphasis on intrinsic variables. In addition, the research leaves doors open for future studies to investigate how these variables interact in the long term, as well as the dynamic nature of motivation at various developmental stages. Through the application of SDT in adolescent physical activity, this study enhances our understanding of how motivation changes as a function of both internal perceptions and external influences, and offers valuable insights for theoretical development as well as practical use in youth physical activity

Limitations and Future Directions

Although this study offers useful information on what affects exercise motivation among middle school students, it is not problem-free. Perhaps the most important limitation is the cross-sectional design of the study, which restricts inferences about causality or the long-term influence of taking part in sports, participation in physical education, perceived health status, and human movement awareness on exercise motivation. Longitudinal designs would be useful to investigate the impact of these factors on motivation across time and whether their effects remain as students move through various stages of education. Another limitation is the use of self-report data that can be susceptible to social desirability bias or flawed self-perception of health status and motivation. Future studies may include more objective indicators, e.g., tracking of physical activity or teacher/coach ratings of student motivation, to improve the validity of the results. The study was based on a general middle school sample, and future research might examine the influence of demographic factors like socioeconomic status, gender, or cultural back-

ground on motivational responses to physical activity. A further research direction could include investigating the relationship between school-level factors and external social influences, for example, family support or peer group social dynamics, on exercise motivation. Lastly, in light of growing interest in online engagement, it would be informative to examine whether technology-based interventions, e.g., fitness applications or online sport programs, would have an effect on motivation and physical activity participation among teenagers. By overcoming these constraints, further research can give us better insight into the dynamic and multifaceted process of exercise motivation to enable more focused and positive strategies for creating lifelong physical activity behavior.

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