

Mechanisms and Drivers for Developing Lifelong Physical Activity Habits Among Adolescents from the Perspective of Physical Literacy

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Abstract: Against the backdrop of the in-depth implementation of the Healthy China Initiative and the National Strategy for Physical Fitness for All, the cultivation of lifelong physical activity habits among young people has become a central issue in school sports reform and the promotion of adolescent health. This paper adopts the theory of physical literacy as its analytical framework to systematically explore the mechanisms and driving pathways for the development of lifelong physical activity habits among adolescents. the study posits that physical literacy serves as the foundational prerequisite for individuals to achieve lifelong physical activity in the realm of physical activity. It comprises four key dimensions-physical ability, sport cognition, emotional attitudes, and value orientations-which collectively constitute the intrinsic motivational system underpinning the development of lifelong physical activity habits among adolescents. At the level of formation mechanisms, the development of lifelong physical activity habits among adolescents follows a logical sequence of ‘cognitive activation-emotional internalization-behavioural reinforcement-habit consolidation’, exhibiting characteristics of gradualism, interactivity and subjectivity. At the level of driving pathways, this paper constructs a multi-layered, systematic driving framework across three dimensions: endogenous, exogenous and comprehensive drivers. the study aims to provide a theoretical reference for school physical education reform and to offer feasible pathways for the practical cultivation of lifelong physical activity habits among adolescents.

Keywords: Physical Literacy; Adolescents; Lifelong Physical Activity Habits; Formation Mechanisms; Motivational Pathways

1 Introduction

1.1 Research Background

In recent years, with the rapid economic and social development of China and profound changes in its social structure, the physical health of young people has increasingly become a focal point of public concern. the results of the Eighth National Survey on Students’ Physical Fitness and Health, released by the Ministry of Education in 2021, show that although the overall physical health of students in China has improved, certain indicators remain cause for concern; issues such as poor eyesight, obesity and declining physical fitness are still widespread among young people. At the same time, it is difficult to effectively guarantee both the quantity and quality of time adolescents spend on physical activity, as the traditional mindset of ‘prioritising academic achievement over physical education’ continues to influence educational decisions in both families and schools. Against this backdrop, how to effectively encourage adolescents to develop lifelong physical activity habits has become a central issue in the reform of school physical education in the new era.

In 2020, the General Administration of Sport and the Ministry of Education jointly issued the ‘Opinions on Deepening the Integration of Physical Education and General Education to Promote the Healthy Development of Young People’, which explicitly called for ‘promoting the coordinated development of academic learning and physical exercise among young people, and helping students to enjoy physical exercise, improve their physical fitness, develop a well-rounded personality and strengthen their willpower’ [1]. In 2021, the ‘Outline of the 14th Five-Year Plan for National Economic and Social Development of the People’s Republic of China and the Long-Range Objectives Through the Year 2035’ further emphasised the need to

‘implement the Youth Sports Activity Promotion Plan’ to cultivate among young people the habit and awareness of lifelong physical exercise [2] [3]. These policy documents issued by the state provide top-level design and directional guidance for the cultivation of lifelong physical exercise habits among young people.

1.2 Problem Statement

However, in practice, the development of lifelong physical activity habits among young people faces numerous challenges. Firstly, with regard to school physical education, traditional teaching methods place too much emphasis on the instruction of motor skills and physical conditioning, whilst neglecting the cultivation of students’ interest in sport and the development of exercise habits; this makes it difficult for students to maintain regular physical activity once they leave school. Secondly, from the perspective of individual students, many adolescents lack an intrinsic interest in physical activity, viewing exercise as an external burden, which makes it difficult for them to develop the motivation to participate proactively. Furthermore, from the perspective of the family and social environment, the pursuit of physical activity among adolescents faces multiple constraints, such as time, venue and equipment, and lacks an external support system conducive to the formation of habits.

Given the existence of the aforementioned issues, there is an urgent need for in-depth theoretical analysis to explore the underlying logic and effective pathways for fostering lifelong physical activity habits among young people. Physical literacy, as a key theoretical framework in the international field of physical education, offers a new analytical perspective for understanding this issue. Physical literacy emphasises the capabilities, confidence, willingness and values that individuals should possess in the realm of physical activity; it encompasses multiple dimensions—including physical, cognitive, emotional and social—and shares an intrinsic theoretical affinity with the development of lifelong physical activity habits. On this basis, this paper attempts to systematically explore the mechanisms and driving pathways for the development of lifelong physical activity habits among adolescents from the perspective of physical literacy, with a view to providing guidance for relevant theory and practice.

1.3 Significance of the Study

From a theoretical perspective, this study combines the theory of physical literacy with research on the development of lifelong physical activity habits, thereby helping to expand and deepen the theoretical framework of lifelong physical activity and providing a new theoretical perspective for research into physical education for young people. Furthermore, by constructing a framework for the mechanisms and drivers underlying the development of lifelong physical activity habits among young people, this study contributes to enriching and refining applied research on physical literacy.

From a practical perspective, this study holds significant practical value in advancing school sports reform, promoting the physical health of young people, and enhancing the level of national fitness. By revealing the underlying mechanisms underlying the development of lifelong physical activity habits among young people, it provides a scientific basis for education authorities and schools to formulate relevant policies, optimise physical education curricula, and improve teaching methods; by establishing a systematic framework, it offers practical guidance for families and society in supporting young people’s participation in physical activity.

2. Theoretical Foundations and Core Concepts

2.1 The Theory of Physical Literacy

The concept of physical literacy was first proposed by the British scholar Margaret Whitehead in 1993, and has since been widely disseminated and applied in regions such as North America, Europe and Australia [4]. In 2010, the International Physical Literacy Association defined physical literacy as ‘the motivation, confidence, ability, knowledge and understanding that an individual acquires through physical activity to maintain physical activity throughout their life’. This definition emphasises that physical literacy is a comprehensive concept encompassing motivation, confidence, ability, knowledge and understanding, spanning the entire lifespan of an individual [5].

The theoretical concept of physical literacy can be understood from multiple dimensions. In terms of structure, physical literacy comprises four core elements: physical competence,

cognitive capacity, affective disposition and value orientation. Physical competence refers to the motor skills and physical fitness levels an individual possesses when participating in various physical activities; cognitive capacity refers to an individual's understanding and application of knowledge, rules and strategies related to physical activities; affective disposition refers to an individual's interest, preferences and emotional experiences regarding physical activity; and value orientation refers to an individual's recognition and internalisation of the value of physical activity. On the process dimension, physical literacy emphasises the dynamic developmental process of 'acquisition-maintenance-reconstruction', whereby an individual's level of physical literacy changes in response to life stages and environmental shifts. On the outcome dimension, the ultimate goal of physical literacy is to promote the realisation of lifelong physical activity and the pursuit of an active and healthy lifestyle.

Whitehead further points out that physical literacy has four key characteristics: universality, inclusivity, lifelong learning and empowerment. Universality implies that physical literacy is a fundamental competence that everyone should possess, regardless of age, gender or ability level; inclusivity implies that physical literacy focuses on the motivation and confidence to participate in physical activity, rather than on competitive performance; lifelong nature implies that physical literacy spans the entire lifespan of an individual and forms the foundation of lifelong physical activity; and empowerment implies that physical literacy enables individuals to participate in a variety of physical activities with confidence and enjoyment. These characteristics provide important theoretical support for understanding the development of lifelong physical activity habits among adolescents.

2.2 The Theory of Lifelong Physical Activity Habits

The theory of lifelong physical activity habits refers to the relatively stable, automatic patterns of physical activity participation formed by individuals through long-term engagement in physical exercise. From a psychological perspective, a habit is a behavioural tendency formed through repetition, which, once established, can be automatically activated in similar situations. The formation of a habit requires three conditions to be met: firstly,

behavioural repetition, meaning the behaviour must be performed repeatedly; secondly, situational stability, meaning the environment in which the behaviour occurs is relatively fixed; and thirdly, behavioural automation, meaning the execution of the behaviour does not require excessive willpower.

Lifelong physical activity habits have four characteristics. Firstly, they are lifelong, meaning that these habits are maintained over a long period of time, spanning the entire lifespan of an individual; secondly, they are stable, meaning that once formed, they are difficult to change and exhibit a high degree of persistence; thirdly, they are automatic, meaning that habitual behaviours are triggered automatically in response to relevant stimuli, without the need for deliberate reminders; and fourthly, they are context-dependent, meaning that the maintenance of these habits is linked to specific contextual cues. The development of lifelong physical activity habits is not only relevant to an individual's physical health but also holds significant value for their mental well-being, social adaptation and all-round development.

With regard to the process of developing lifelong physical activity habits, psychological research indicates that habit formation follows a developmental pathway of 'intention—behaviour—habit'. During the intention stage, individuals form the desire and plan to participate in physical activity; during the behaviour stage, they actually engage in physical activity and gain corresponding experiences; and during the habit stage, the behaviour gradually becomes automatic, forming a stable pattern of behaviour. This process requires the combined influence of cognitive, emotional and behavioural factors, as well as ongoing support from the external environment.

2.3 The Intrinsic Link Between Physical Literacy and Lifelong Physical Activity Habits

There is a close intrinsic link between physical literacy and lifelong physical activity habits. From a theoretical perspective, physical literacy provides the prerequisites and foundational support for the development of lifelong physical activity habits. An individual with good physical literacy typically possesses the physical abilities, cognitive abilities, emotional attitudes and value orientations required to participate in physical activities; these factors collectively constitute the

intrinsic motivational system for the development of lifelong physical activity habits. From a practical perspective, every dimension of physical literacy is closely linked to the formation of lifelong physical activity habits: physical abilities provide the technical foundation for habit formation; cognitive abilities provide the knowledge base; emotional attitudes provide the source of motivation; and value orientations provide the sustained driving force.

From the perspective of developmental psychology, adolescence is a critical period for the development of physical literacy and the formation of lifelong physical activity habits. Adolescents are in a sensitive phase of physical and mental development, during which all dimensions of physical fitness are undergoing rapid development and exhibit high plasticity. The level of physical fitness and patterns of physical activity established at this stage will have a profound impact on the formation of an individual's lifelong physical activity habits. Therefore, seizing this critical period in adolescence to systematically cultivate physical fitness and promote the development of lifelong physical activity habits is of significant strategic importance.

3. Analysis of the Mechanisms Underlying the Development of Lifelong Physical Activity Habits Among Adolescents

3.1 Theoretical Framework of the Development Mechanism

Building on the theoretical foundations outlined above, this paper constructs a theoretical analytical framework of 'physical literacy—habit formation'. This framework interprets the development of lifelong physical activity habits among adolescents as the result of the synergistic interaction of various dimensions of physical literacy, emphasising the incremental, interactive and subject-centred nature of the development process.

3.1.1 Gradual Nature

The development of lifelong physical activity habits among adolescents is a gradual process that cannot be achieved overnight. From the perspective of behaviour change theory, changes in individual behaviour typically involve four stages: 'unconscious non-action—conscious non-action—conscious action—unconscious action'. Accordingly, the development of

lifelong physical activity habits among adolescents can be divided into four progressive stages: 'cognitive emergence—emotional identification—behavioural practice — habit consolidation'. During the cognitive emergence stage, adolescents begin to recognise the value and significance of physical activity; during the emotional identification stage, they develop an interest in and fondness for physical activity; during the behavioural practice stage, they begin to actively participate in physical activity and form regular patterns of behaviour; and during the habit consolidation stage, physical activity becomes an integral part of their lifestyle, exhibiting characteristics of automaticity.

3.1.2 Interactional Characteristics

In the process of developing lifelong physical activity habits among adolescents, there are complex interactions between various influencing factors. The four dimensions of physical literacy influence and interact with one another: improvements in physical ability help to boost confidence and interest in participation; the development of cognitive abilities helps to deepen value identification; the adoption of positive emotional attitudes helps to maintain behavioural consistency; and the internalisation of value orientations helps to strengthen behavioural motivation. At the same time, there is also an interaction between individual and environmental factors; an individual's level of physical literacy influences their perception of and response to environmental stimuli, whilst environmental factors, in turn, influence the development of an individual's physical literacy and the formation of habits.

3.1.3 Characteristics of Agency

The development of lifelong physical activity habits among adolescents is characterised by a distinct sense of agency. In the process of habit formation, adolescents are not passive recipients, but active participants and shapers of their own habits. An individual's autonomy, ability to make choices, and creativity play a crucial role in this process. Only when young people genuinely recognise the value of physical activity, develop an intrinsic motivation to participate, and are able to independently choose the type and intensity of exercise that suits them, can the formation of these habits be sustainable. Therefore, the process of habit formation must respect the agency of young people and focus on stimulating their intrinsic motivation.

3.2 Core Elements of the Habit-Forming Mechanism

Based on the analytical framework outlined above, the mechanism for fostering lifelong physical activity habits among adolescents can be summarised as a logical sequence of 'cognitive activation-emotional internalization-behavioural reinforcement-habit consolidation', with these four stages interlinked and progressing sequentially.

3.2.1 The Cognitive Activation Mechanism

Cognitive activation marks the starting point for the formation of lifelong physical activity habits among adolescents, with its core focus being to help adolescents develop a correct understanding of physical activity. This mechanism primarily comprises three dimensions. Firstly, value recognition: this involves enabling adolescents to recognise the multifaceted benefits of physical activity for physical and mental health, as well as social adaptation, and to understand the significance of lifelong physical activity for personal development; secondly, knowledge-based cognition, which involves equipping adolescents with fundamental knowledge of physical education and health, the principles of motor skills, and scientific exercise methods, thereby providing a cognitive foundation for participation in physical activities; and thirdly, self-cognition, which involves helping adolescents objectively recognise their own physical condition, athletic ability and interests, and form reasonable expectations regarding their participation in physical activities. The realisation of cognitive activation requires multiple approaches, such as physical education and health curriculum teaching, specialised lectures and public awareness campaigns, to ensure that adolescents obtain comprehensive and accurate information regarding physical activities.

3.2.2 Mechanisms of Emotional Internalisation

Emotional internalisation is a crucial stage in the development of lifelong physical activity habits among adolescents, the core of which lies in fostering positive emotional experiences and attitudes towards physical activity. This mechanism involves three aspects: the cultivation of interest, the experience of achievement, and a sense of self-efficacy. Interest is a key psychological factor that motivates individuals to participate actively in physical activity; fostering adolescents' interest in sport requires creating engaging teaching environments, offering a diverse range of

sporting options, and respecting individual differences. A sense of achievement refers to the feeling of success adolescents gain from physical activities; this sense of success serves to reinforce their motivation to participate. Self-efficacy refers to an individual's belief in their ability to perform specific tasks; adolescents with high self-efficacy are more likely to persist with physical activities. To achieve emotional internalisation, teachers must focus on creating a positive learning atmosphere during the teaching process, providing appropriate challenges and opportunities for success, and helping students form positive experiences of physical participation.

3.2.3 Behavioural Reinforcement Mechanism

Behavioural reinforcement is a central process in the development of lifelong physical activity habits among adolescents; its core lies in transforming external behavioural requirements into internal behavioural tendencies through sustained practice. This mechanism adheres to the fundamental principles of behaviourist learning theory and emphasises the crucial role of reinforcing factors in the habit-forming process. Behavioural reinforcement comprises two forms: positive reinforcement and negative reinforcement. Positive reinforcement refers to strengthening behaviour by increasing pleasurable stimuli, such as praising and rewarding adolescents who persist in physical activity; negative reinforcement refers to strengthening behaviour by removing aversive stimuli, such as reducing the consequences of not participating in physical activity. The effective implementation of behavioural reinforcement requires the establishment of stable routines for participation in physical activity, the provision of sufficient time and space for exercise, as well as appropriate external incentives and support.

3.2.4 The Mechanism of Habit Consolidation

Habit consolidation represents the final stage in the development of lifelong physical activity habits among adolescents, the core of which lies in bringing physical activity participation to a level of automaticity. The key to this mechanism of habit consolidation is the establishment of stable links between behaviour and context, enabling specific contextual cues to automatically trigger physical activity. Three conditions must be met for habit consolidation to occur. Firstly, regularity of behaviour: physical activity must take place at fixed times and in

fixed locations to form a stable behavioural pattern. Secondly, situational stability: the sporting environment and conditions must remain relatively consistent to establish stable situational cues. Thirdly, sustained practice: behaviour is gradually automated through long-term, repetitive practice. Once habits are consolidated, adolescents can maintain their participation in physical activity even in the absence of external supervision, demonstrating that 'practice makes perfect'.

4. Drivers of Lifelong Physical Activity Habits Among Adolescents

Based on the analysis of the formation mechanisms outlined above, this paper constructs a multi-level framework of drivers for lifelong physical activity habits among adolescents, drawing on three dimensions: endogenous drivers, exogenous drivers and integrated drivers.

4.1 The Internally Driven Approach

The internally driven approach refers to a method of fostering lifelong physical activity habits by stimulating young people's intrinsic motivation and sense of agency. This approach emphasises starting with the young people themselves, activating their internal drive by cultivating their interests, enhancing their sense of efficacy, and reinforcing their sense of shared values.

4.1.1 Fostering Interest

Interest is the best teacher and serves as the intrinsic motivation driving young people to actively participate in physical activities. Fostering interest requires an approach that takes into account sporting experiences, individual differences, experiences of success and curiosity.

(1) Enriching sporting experiences. Schools should provide a diverse range of physical activities and sports, giving young people the opportunity to encounter and try different types of sport, thereby enabling them to discover their own interests. At the same time, teaching content should emphasise enjoyment, employing gamified and contextualised teaching methods to enhance the appeal of physical activities.

(2) Respecting individual differences. As each young person has different interests and levels of development, fostering interest requires a tailored approach. Teachers should pay attention to individual differences, providing differentiated learning content and assessment

criteria so that every student can experience success in an area suited to them.

(3) Creating experiences of success. Self-determination theory posits that a sense of competence is a key source of intrinsic motivation. Teachers should set appropriate learning objectives to ensure that the majority of students can experience success through their efforts, thereby boosting their confidence and interest in participating.

(4) Stimulating curiosity. Curiosity is the precursor to interest. Teachers can spark young people's curiosity by showcasing the appeal of sport, sharing stories of sporting heroes, and introducing emerging sports, thereby encouraging them to explore and participate proactively.

4.1.2 Enhancing Self-Efficacy

Self-efficacy refers to an individual's belief in their ability to successfully complete a specific task. Adolescents with high self-efficacy are more likely to persevere with physical activity and are better able to overcome difficulties and setbacks encountered during participation. Efforts to enhance self-efficacy can focus on experiences, verbal encouragement, observational learning and emotional regulation.

(1) Providing experiences of success. Experiences of success are the most direct and effective way to enhance self-efficacy. Teachers should design lessons of appropriate difficulty, allowing students to learn within their 'zone of proximal development' and achieve success through their own efforts.

(2) Verbal encouragement. Positive feedback from teachers and parents has a significant influence on the development of adolescents' self-efficacy. Adults should offer adolescents ample encouragement and affirmation to help them build a positive self-image.

(3) Observational learning. Observing the successful behaviour of others (particularly those similar to oneself) can also enhance self-efficacy. Schools can organise for students to watch videos of top athletes in competition, or have students with strong athletic abilities demonstrate and lead by example.

(4) Emotional regulation. Negative emotions such as anxiety and tension can diminish self-efficacy. Teachers should help students learn methods of emotional regulation so that they can approach physical activities and challenges with a more positive mindset.

4.1.3 Value-driven Motivation

Value-driven motivation refers to an individual's deep understanding and inner acceptance of the value of physical activity. The formation of value-driven motivation requires a process of transition from external recognition of value to the internalisation of that value. Value-driven motivation can be explored through the dimensions of value recognition, emotional experience, value internalisation and a sense of responsibility.

(1) Deepening value recognition. Through systematic physical education and health education, help young people fully understand the multiple values of physical activity in terms of physical health, mental well-being, social adaptation and personal development, thereby forming correct values regarding sport.

(2) Strengthening emotional experiences. Positive emotional experiences form an important foundation for the development of value identification. Schools should create a favourable environment for physical education, enabling students to gain positive emotional experiences such as joy and fulfilment through their activities.

(3) Promoting the internalisation of values. The internalisation of values refers to the transformation of external value requirements into internal value orientations. This requires adolescents to engage in constant reflection and experience through physical education practice, thereby truly integrating sporting values into their own value systems.

(4) Cultivating a sense of responsibility. Adolescents should be guided to recognise that physical exercise is not merely a personal matter, but also a responsibility owed to the family, society and the nation; this fosters a sense of responsibility and a sense of mission in their active participation in sporting activities.

4.2 Exogenous-Driven Approach

The exogenous-driven approach refers to a pathway that promotes the development of lifelong physical activity habits among young people by optimising the external environment and conditions. This approach emphasises creating favourable conditions for young people's participation in sport through environmental development, curriculum optimisation, and collaboration between home, school and the community.

4.2.1 Curriculum optimisation

The school physical education curriculum is the

primary channel for promoting the development of physical literacy and the formation of lifelong physical activity habits among young people [6]. Curriculum optimisation should focus on four key areas: curriculum philosophy, curriculum content, teaching methods and curriculum implementation.

(1) Updating curriculum philosophy. Curriculum design should shift from a 'skills-oriented' approach to a 'competence-oriented' one, making the cultivation of students' physical competence and lifelong physical activity capabilities the core objectives of the curriculum [7]. This implies that the curriculum must not only impart sporting skills but also foster students' interest in sport, exercise habits and the ability to exercise independently.

(2) Optimising curriculum content. Whilst ensuring the acquisition of basic sporting skills, the curriculum should incorporate introductions to and experiences of emerging sports such as roller skating, rock climbing and yoga, to meet students' diverse interests. At the same time, health education content should be integrated more effectively to help students develop sound health concepts.

(3) Innovate teaching methods. Promote teaching approaches such as situational teaching, gamified learning and cooperative learning to enhance the appeal and effectiveness of physical education lessons. Emphasise the active role of students, guiding them to participate proactively and engage in independent exploration.

(4) Improve curriculum implementation. Guarantee sufficient physical education lesson time and exercise time to ensure that every student has ample opportunities for physical activity each day. Strengthen the integration of in-class and out-of-class activities, organically combining classroom teaching with extracurricular sports activities.

4.2.2 Environmental Factors

A supportive physical education environment is essential for young people to develop lifelong physical activity habits [8]. Efforts to create such an environment should address both the physical and social aspects.

(1) Physical environment. Schools should increase investment in sports grounds, facilities and equipment to create a safe, adequate and modern sporting environment. The layout of facilities should be optimised to ensure that all types of sports grounds are sensibly distributed and fully functional. Equipment management

should be strengthened, with timely maintenance and replacement of sports equipment to ensure safety during activities. (2) Regarding the social environment. A positive campus sports culture should be fostered, promoting the spirit of sport and concepts of health through initiatives such as sports festivals, sports days and honour boards. the influence of peers should be harnessed to encourage mutual support and learning amongst students. Harmonious teacher-student relationships should be established, with teachers leading by example, showing care for their pupils, and acting as guides and supporters of student participation in sport.

4.2.3 Collaborative Efforts by Schools, Families and the Community

Fostering lifelong physical activity habits among young people is a systematic endeavour that requires the concerted efforts of schools, families and the community.

Regarding collaboration between schools and families: Establish communication channels between schools and families to provide parents with timely feedback on their children's physical education progress and physical health. Conduct physical education programmes for parents to guide them in developing a sound understanding of physical activity and to create a supportive home environment for their children's participation in sports. Encourage parents and children to take part in physical activities together, thereby strengthening family bonds whilst cultivating students' exercise habits.

Regarding collaboration between schools and the community: Make full use of community sports resources, such as public sports venues, community fitness centres and youth sports clubs, to provide students with more opportunities for physical activity and guidance services. Strengthen cooperation with specialist sports organisations to bring in professional sports coaches and instructors. Harness the positive influence of media discourse to foster a favourable social atmosphere in which the whole of society pays attention to youth sports.

4.3 Comprehensive Approach

The comprehensive approach refers to a pathway that promotes the development of lifelong physical activity habits among young people through a combination of measures, including institutional design, cultural development and technological empowerment. This approach emphasises the systematic integration and

synergistic effects of multiple factors.

4.3.1 Evaluation-led Approach

A scientific and effective evaluation system plays a vital role in guiding and motivating young people's participation in physical activity. Evaluation reforms should be advanced in three key areas: evaluation content, evaluation methods and the implementation of results.

(1) Refine assessment content. Establish a comprehensive assessment system covering all dimensions of physical literacy, evaluating not only sporting skills and physical fitness levels, but also students' attitudes towards physical activity, exercise habits, collaborative relationships and mental health.

(2) Improve assessment methods. Adopt a combination of formative and summative assessment, as well as quantitative and qualitative evaluation, to assess students' physical education progress comprehensively and objectively. Introduce self-assessment and peer-assessment mechanisms to cultivate students' self-evaluation skills and reflective awareness.

(3) Strengthen the application of assessment results. Incorporate physical education assessment results into the comprehensive student evaluation system, using them as one of the reference criteria for selecting outstanding students, awarding honours, and determining university admissions and employment. Leverage the diagnostic, feedback and motivational functions of assessment to promote continuous improvement among students.

4.3.2 Cultural Enrichment as a Driving Force

Sports culture plays a profound role in nurturing young people's sporting values and habits. Cultural enrichment should be approached from four key perspectives: the Chinese sporting spirit, the Olympic spirit, school sports culture, and the wider social sporting environment.

(1) Preserving the Chinese sporting spirit. We should explore and promote traditional Chinese sports culture, such as martial arts and qigong, enabling young people to strengthen their confidence in sports culture whilst gaining an understanding of their national heritage.

(2) Promoting the Olympic Spirit. Promote the Olympic ideals of 'Faster, Higher, Stronger, Together' to cultivate in young people a spirit of proactive endeavour and teamwork.

(3) Fostering a campus sports culture. Creating distinctive school sports culture brands and organising a rich variety of sports and cultural

activities to make sport an integral part of campus culture [9].

(4) Cultivating a social atmosphere conducive to sport. Through media coverage and the example set by public figures, fostering a positive atmosphere throughout society that values and encourages participation in sport, thereby helping young people to develop a lifelong commitment to physical activity through osmosis.

4.3.3 Driving Force of Digital Empowerment

Advances in information technology have provided new tools and possibilities for physical education among young people. Digital empowerment can be implemented in four key areas: enriching teaching resources, innovating teaching models, personalising learning, and strengthening process management.

(1) Enriching teaching resources. By utilising multimedia and the internet, high-quality physical education resources can be developed and integrated to provide students with a wealth of learning content.

(2) Innovating teaching models. Leverage technologies such as virtual reality (VR) and augmented reality (AR) to create immersive sports experience scenarios, thereby enhancing the engagement and effectiveness of physical education.

(3) Promoting personalised learning. Utilise big data and artificial intelligence technologies to analyse students' sports performance data and learning characteristics, providing personalised exercise programmes and learning recommendations.

(4) Strengthening process management. Employ information technology to establish a dynamic monitoring system for students' participation in physical education and physical fitness, providing data support for teaching and health management.

5. Policy Recommendations

Based on the theoretical analysis and exploratory approaches outlined above, this study proposes the following policy recommendations to promote the development of lifelong physical activity habits among young people, covering four key areas.

5.1 National Level

5.1.1 Improving the Policy and Regulatory Framework

It is recommended that the policy and regulatory

framework for youth sports be further strengthened, clarifying the division of responsibilities among governments at all levels, schools, families and society, and establishing a collaborative framework for implementation. Financial investment in youth sports should be increased to ensure funding for the construction and maintenance of school sports venues, facilities and equipment. the youth sports competition system should be improved, establishing a competition mechanism accessible to all students, using competitions to promote training and teaching.

5.1.2 Deepening the Reform of Physical Education Curricula

It is recommended that the Ministry of Education further advance the reform of school physical education curricula by formulating more scientifically sound curriculum standards and evaluation systems. the proportion of physical education lessons should be increased to ensure that students have at least one hour of physical activity per day. the structure of curriculum content should be optimised, with a focus on integrating emerging sports with traditional disciplines. Efforts should be made to promote the deep integration of physical education and health education, strengthening health literacy and the cultivation of healthy lifestyle habits.

5.1.3 Strengthening the Development of the Teaching Workforce

It is recommended that the training and professional development of physical education teachers be strengthened to enhance their professional competence and teaching abilities. the staffing levels and remuneration packages for physical education teachers should be improved to attract high-calibre talent to the field of school physical education. Efforts should be made to encourage outstanding coaches and athletes to work in schools, thereby harnessing the expertise of these professionals in the physical education of young people.

5.2 School Level

5.2.1 Establishing the 'Health First' Educational Philosophy

Schools should thoroughly understand and implement the 'Health First' educational philosophy, making the promotion of student health the starting point and ultimate goal of their work [10]. They should shift away from an assessment approach that prioritises academic

grades alone, and incorporate students' physical health into the school's quality evaluation system. Schools should optimise their curriculum to ensure the effective delivery of physical education and health courses.

5.2.2 Innovating Physical Education Teaching Methods

Schools should encourage physical education teachers to innovate teaching methods and approaches to enhance the appeal and effectiveness of physical education lessons. Teaching methods such as project-based learning, cooperative learning and inquiry-based learning should be promoted to empower students as active participants. Emphasis should be placed on teaching according to individual aptitude, providing differentiated teaching content and methods for students of varying abilities and interests.

5.2.3 Enriching Extracurricular Physical Activities

Schools should organise a wide range of extracurricular physical activities to meet students' diverse sporting needs. Various sports interest groups and teams should be established to cultivate students' sporting talents. Events such as school sports festivals and sports days should be held to foster a vibrant sporting atmosphere. The integration of in-class and extracurricular activities should be strengthened, and a mechanism should be established to ensure a seamless transition between physical education lessons and extracurricular activities.

5.2.4 Establishing a Collaborative Education Mechanism

Schools should establish a collaborative education mechanism involving schools, families and society to form a collective synergy that promotes youth participation in sport. Communication with parents should be strengthened to encourage them to value and support their children's physical exercise. Social sports resources should be actively incorporated to expand the scope and channels for youth sports activities.

5.3 At the Family Level

5.3.1 Fostering a Positive Attitude Towards Physical Activity

Parents should move away from a mindset that prioritises academic grades above all else and fully recognise the vital role that physical activity plays in the physical and mental well-being of young people. They should support

their children's participation in physical activities and make exercise an integral part of their daily lives. Parents should ensure that their children have the necessary time, space and resources to take part in physical activities.

5.3.2 Fostering a Positive Family Environment for Physical Activity

Parents should lead by example, taking the initiative to participate in physical activities and fostering a family atmosphere where everyone exercises together. They should select suitable sports for their children based on their interests and hobbies, whilst providing ongoing support and encouragement. Parents should also organise their children's daily schedules sensibly to ensure they have sufficient time for physical exercise.

5.3.3 Strengthening Parent-Child Sports Interaction

Parents should set aside time to participate in sports activities with their children, using these interactions to strengthen the parent-child bond and foster their children's interest in sport. They should pay attention to their children's participation in sports, offering appropriate encouragement and guidance to help them overcome difficulties and persevere.

5.4 Social Dimension

5.4.1 Optimising Public Sports Services

The government should step up efforts to build public sports facilities and make more sports venues available to young people free of charge. It should regulate the youth sports training market and improve the quality and standards of sports training services [11]. A youth sports information service platform should be established to provide guidance and support for young people's participation in sport.

5.4.2 Harnessing the Guiding Role of the Media

The media should increase publicity for youth sport and disseminate scientific sports knowledge and healthy lifestyles. It should highlight exemplary cases in youth sport to serve as role models. A positive public discourse should be fostered across society to promote concern for young people's health and support for youth sport.

5.4.3 Promoting the Development of the Sports Industry

Sports enterprises should develop sports products and services tailored to the characteristics of young people to meet their diverse sporting consumption needs. They

should promote the integrated development of sport with other sectors such as culture and tourism to expand the scope and formats of youth participation in sport [12]. Industry self-regulation should be strengthened to standardise the order of the youth sports market.

6. Conclusions and Outlook

6.1 Research Conclusions

Drawing on the theory of physical literacy as an analytical framework, this paper systematically examines the mechanisms and driving factors underlying the development of lifelong physical activity habits among adolescents, arriving at the following three main conclusions.

(1) Physical literacy serves as the fundamental prerequisite for individuals to achieve lifelong physical activity. It comprises four key dimensions—physical ability, sport cognition, emotional attitudes, and value orientations—which collectively constitute the internal operational system underpinning the formation of lifelong physical activity habits among adolescents. A close intrinsic relationship exists between physical literacy and lifelong physical activity habits, with physical literacy providing the preconditions and foundational support for the development of such habits.

(2) the development of lifelong physical activity habits among adolescents follows a logical sequence of ‘cognitive activation – emotional internalisation – behavioural reinforcement – habit consolidation’, exhibiting characteristics of gradual progression, interactivity and agency. Cognitive activation serves as the starting point, emotional internalisation is the key, behavioural reinforcement is the core, and habit consolidation is the goal; these four elements are interconnected and progress sequentially.

(3) the development of lifelong physical activity habits among adolescents requires the synergistic interaction of endogenous, exogenous and comprehensive drivers. Endogenous drivers activate adolescents’ intrinsic motivation through the cultivation of interest, enhancement of efficacy and affirmation of values; exogenous drivers optimise external conditions through curriculum refinement, environmental creation and collaboration between home, school and community; comprehensive drivers provide systematic support through evaluation-led guidance, cultural enrichment and digital

empowerment.

6.2 Limitations of the Study

This study is subject to certain limitations. Firstly, the analysis is primarily theoretical in nature and lacks empirical data to support it; future research could test the relevant theoretical hypotheses through methods such as questionnaire surveys and experimental studies. Secondly, the causal pathways proposed in this study are relatively broad, and further research is needed to refine them at the operational level. Finally, this study focuses primarily on general analysis, and there is a lack of analysis of differences among adolescents from different regions and of different types.

6.3 Future Research Directions

Based on the conclusions and limitations of this study, future research could be further developed in the following four areas: firstly, conducting large-scale empirical studies to verify the mechanisms through which the various dimensions of physical literacy influence the development of lifelong physical activity habits; secondly, undertaking targeted intervention studies to test the practical effectiveness of different motivational pathways; thirdly, employing longitudinal research methods to examine the long-term developmental trajectories of lifelong physical activity habits among adolescents; and fourthly, integrating information technology to explore new models and pathways for physical education among adolescents in the digital age.

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