



The role of sociocultural factors on physical fitness in PON-achieving students from watershed area schools

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ABSTRACT

Sociocultural factors can contribute to the level of physical fitness. This study aims to determine the level of students' physical fitness and the role of sociocultural influences. This research design uses a mix-method explanatory approach that produces quantitative data and is reinforced by qualitative data. The sampling technique was purposive sampling, and the sample of this study was 30 students with achievements in the National Sports Week (PON) who attended schools in the watershed area. The average results of male students' physical fitness data are in the good category (48.27 ml/kg/min), and female students' physical fitness is also in the good category (36.65 ml/kg/min). This condition is supported by the sociocultural roles experienced by students. The sociocultural roles include those of coaches who are firm, disciplined, measured, and motivating; self-awareness of the value of leading a healthy lifestyle, which is reinforced by parents who actively remind and set an example; social support from family and friends; and the influence of the sociocultural environment, which includes local-specific physical activities like farming, hunting, and driving a "jukung" to school. The role of the government provision of infrastructure and facilities in the home and school environment, and the role of teachers who provide extracurricular activities, as well as cultural traditions such as dance and martial arts, have a role in shaping their physical fitness.

Keywords: culture, fitness, physical, social, students

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INTRODUCTION

The 2024 Sports Development Index report shows that the physical fitness index has increased, but those in the "very poor" category are still very large, 55.5%, or equivalent to 114 million people, and those in the "poor" category are 24.7%, or equivalent to 50.7 million people (Cholik et al., 2025). In a school setting, this needs to be a concern for physical education teachers to improve students' physical fitness through physical activities that are structured in the learning process. Some factors that can affect students' physical fitness include location of residence, the lifestyle adopted by students, type of food consumed, living environment, and students' school commuting habits. All these factors have great potential to affect everyone's level of physical fitness (Prastyawan & Pulungan, 2022).

Additionally, central Kalimantan is a province predominantly inhabited by the Dayak tribe, which is very rich in arts and culture (Suswandari et al., 2022). The philosophy adopted by the Dayak tribe is the huma betang philosophy. Huma betang has the meaning of the value of togetherness, helping, egalitarianism, kinship, consensus, and living in a civilized manner (Suwarno, 2017). The social behavior of the community is also strongly influenced by this philosophy. Dayak cultural values are also very well maintained and continue to be widely promoted through the annual Isen Mulang Cultural Festival (FIBM) aiming to preserve local culture (Widen et al., 2024).

Central Kalimantan is characterized by numerous large rivers that traverse its territory (Hamidah et al., 2016). One of the major rivers, the Katingan River, originates in the mountainous forested regions of the southern uplands and flows through various districts before emptying into the Celebes Sea. It remains an essential transportation route for residents. Rattan and rubber farmers frequently travel to their plantations using traditional boats and the river is also a vital corridor for students who must cross it to reach school (Prastiwi, 2021). In addition to the Katingan River, the Mentaya River, located in the eastern part of Central Kalimantan near the city of Sampit, also plays a central role in daily life. The communities along its banks engage in traditional livelihoods that are closely tied to the natural environment (Esariti et al., 2018). These riverine conditions significantly influence access to educational facilities, with infrastructure generally being more developed in areas along the Mentaya River. Moreover, physical fitness is one of the important aspects supporting student participation in the learning process and academic achievement (Han, 2018). The level of students' physical fitness greatly affects all activities they do both inside and outside of school (Watikasari, 2023). Students who have good physical fitness will have a good level of concentration and focus in following the learning process so that it can support improved academic achievement (Shin et al., 2024). Fitness levels are commonly assessed using VO₂ max, which measures the cardiovascular and metabolic system's ability to transport and utilize oxygen to support muscular performance (Helgerud et al., 2007). Various types of physical activity are important to improve physical fitness in school-aged children (Chen et al., 2018). The role of schools to organize activities outside the learning process, such as joint gymnastics, active walking, and extracurricular activities, will certainly have an impact on the level of students' VO₂ max so that their physical fitness will be better. Additionally, the sociocultural environment in which students live has a strong impact on their physical health and fitness. Social factors like neighborhood conditions and dietary habits are particularly influential on students' health outcomes (Carrus et al., 2018).

In Indonesia, sports and physical activity are also promoted through national and regional initiatives such as the National Sports Week (PON), modeled after the Olympics (Ma'mun, 2019; Roche, 2002). It can help new athletes with potential emerge and improve their sporting achievements (Chappelet, 2016). In the education sector, similar initiatives include the Regional Student Sports Week (Popda), National Student Sports Week (Popnas), and the National Student Sports Olympiad (O2SN). These programs, both competitive and non-competitive, are widely implemented in schools and encourage teachers to actively support athlete development through their teaching (Lumintuarso et al., 2013). Sociocultural values in an area will also affect people's behavior. The lifestyle will usually tend to form a similar pattern in carrying out daily activities (Pinxten & Lievens, 2014). Social factors such as environment, family, and economic level have an important role in shaping a person's behavior towards physical activity. In addition, cultural values in the community in the form of dance and traditional martial arts can also be a driving activity in maintaining physical fitness. Culture is inseparable from the issue of identity, which is the bearer of culture (Mardotillah & Zein, 2016). It emphasizes that each region has its own cultural diversity.

This sociocultural dimension strongly influences behavior and participation in efforts to improve physical fitness. Social environmental factors, family, friends, and community have an important role in shaping individual behavior in fostering awareness of physical activity. Previous research shows that the sociocultural foundation is more effective in increasing community participation in health programs (Sinaulan, 2012). However, in-depth studies on the role of sociocultural dimensions in shaping students' physical fitness in Indonesia are still very limited. Therefore, this study aims to expand the literature on how the role of sociocultural dimensions affects students' physical fitness, presenting data on the results of physical fitness between students in the watershed and Mentaya areas. The results of this study are expected to be the basis of a policy for schools to be able to make more inclusive programs for students to improve physical fitness and for parents to optimize their role through socioculture in supporting children's activities.

METHOD

The method used in this research is the explanatory sequential mixed method, which combines quantitative and qualitative data (Figure 1). This method aims for qualitative data to help explain or develop preliminary quantitative results (Creswell et al., 2004). The sampling technique used was purposive sampling. The number of samples for this study was 10 male athletes and 20 female athletes. The inclusion criteria in the purposive sampling are students who are members of the Central Kalimantan contingent, and students who excel in the National Sports Week (PON) XXI Aceh-North Sumatra Year 2024, and 3) students who go to school in the watershed area.

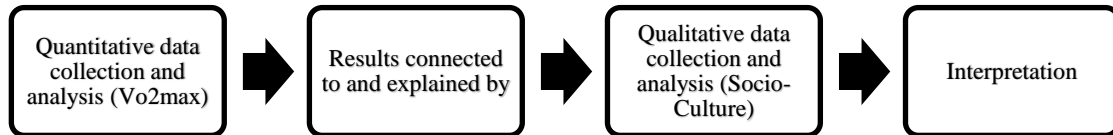


Figure 1. Explanatory sequential mixed-methods design

This design begins by collecting quantitative data through the implementation of student VO2 max tests using the PacerTest running test instrument (Progressive Aerobic Cardiovascular Endurance Run to obtain VO2 max data (Kemenpora, 2022)). The category norms used are shown in Table 1 and Table 2.

Table 1. Score category norms of 16 years old (Male)

No	Score	Category
1.	≥ 49.9	Excellent
2.	48.1 – 49.6	Good
3.	43.4 – 47.8	Average
4.	39.9 – 43.1	Poor
5.	≤ 39.6	Very Poor

Source: (KEMENPORA, 2022)

Table 2. Score category norms of 16 years old (Female)

No.	Score	Category
1.	≥ 39.6	Excellent
2.	36.1 – 39.2	Good
3.	33.6 – 36	Average
4.	30.2 – 33.3	Poor
5.	≤ 29.8	Very Poor

Source: (KEMENPORA, 2022)

Then, qualitative data were collected through observations and interviews to obtain a more in-depth description of the characteristics of the role of sociocultural factors that influence students' physical fitness levels to produce comprehensive data and understanding.

FINDINGS AND DISCUSSION

The findings in this study were obtained based on field studies on high school students around the Katingan and Mentaya watersheds who are members of the Central Kalimantan PON contingent and excel in the XXI Aceh-Sumut 2024 PON event. The data collected consisted of 2 (two) things, which are the students' VO2 max and the influencing sociocultural roles.

Findings

The results obtained through the test are then grouped by gender because, according to the national student fitness test instrument (TKPN), the VO2 max level is divided into male and female categories (KEMENPORA, 2022). As presented in Table 3, there were 30 test participants

consisting of 10 males and 20 females. The highest ability that can be achieved is level 12 shuttle 4, while the lowest is level 5 shuttle 7. Descriptive analysis presented in Table 4 shows the male students obtained a mean value of 48.27, an SD value of 3.58, a max value of 54.7, and a min value of 43.4, while the female students obtained a mean value of 36.65, an SD value of 3.64, a max value of 47.8, and a min value of 32.2.

Table 3. VO2 max test results

Name	Level	Shuttles	Vo2max (Ml/Kg/Min)	Gender
S1	10	8	49.0	M
S2	10	5	48.1	M
S3	10	2	47.2	M
S4	10	5	48.1	M
S5	9	1	43.4	M
S6	12	1	53.8	M
S7	9	6	45.0	M
S8	10	4	47.8	M
S9	9	8	45.6	M
S10	12	4	54.7	M
S11	10	4	47.8	W
S12	6	11	36.6	W
S13	7	9	39.2	W
S14	7	7	38.6	W
S15	8	2	40.2	W
S16	6	11	36.6	W
S17	5	7	32.2	W
S18	6	4	34.3	W
S19	7	9	39.2	W
S20	8	2	40.2	W
S21	6	1	33.3	W
S22	6	3	33.9	W
S23	6	4	34.3	W
S24	6	9	36.0	W
S25	7	4	37.6	W
S26	6	10	36.3	W
S27	5	8	32.6	W
S28	7	2	36.9	W
S29	6	1	33.3	W
S30	6	3	33.9	W

Table 4. Descriptive analysis data results

	(N)	Mean (M)	Standard Deviation (SD)	Variance (S)	Max	Min
Male VO2 Max	10	48.27	3.58	12.82	54.7	43.4
Female VO2 Max	20	36.65	3.64	13.29	47.8	32.2

Based on the VO2 max test results (Figure 2), 20% of male students are in the excellent category, 50% in the good category, 30% in the average category, 0% in the poor category, and 0% in the very poor category, while for female students, 15% are in the excellent category, 40% in the good category, 25% in the average category, 20% in the poor category, and 0% in the very poor category. It can be concluded based on the results above that the average student's physical fitness is in the good category.

The results showed that the average physical fitness of the participants was in the good category. It was evidenced by the results of the physical fitness test and by the existence of various sociocultural roles of the participants themselves that supported the development of a healthy lifestyle and regular physical activity. Social culture acts as an external factor that influences individual habits and lifestyles, both directly and indirectly. The following is a discussion of the

sociocultural roles that can support the achievement of students' physical fitness through interviews related to the students' sociocultural roles.

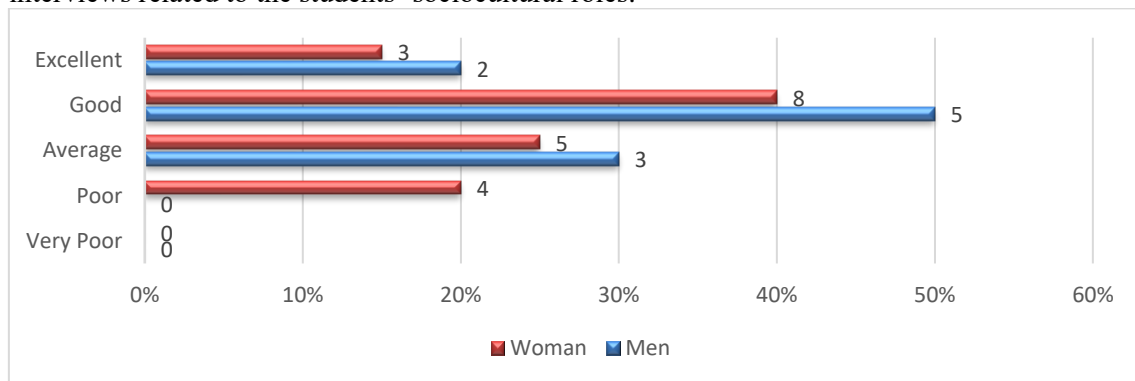


Figure 2. Percentage of VO2 max for male and female students

The coach's role in physical fitness development

Coaches have a significant contribution in shaping discipline, assertiveness, motivation, care, regularity, and consistency of training. A coach who is strict and provides structured directions can motivate participants to follow the training program in an optimal way. In sports culture, coaches are often seen as authoritative figures who not only teach techniques but also instill values of discipline and a hardworking attitude.

“Pelatih tu... sering bilang ‘kalau “ikam” latihan yang teratur itu penting buat “ikam, harus disiplin, dan serius” (student)

(The coach often says that regular training is important for you; you have to be disciplined and serious)

“The coach also always motivates us so that we don't give up easily and keep our morale up, especially during tough training.” (student)

Another student, who trains in rowing, also revealed, “The coach used to remind us that we must achieve our targets and be disciplined” (student rowing athlete).

The aforementioned conditions encourage individuals to achieve good physical fitness, especially through a measured and systematic exercise program.

Self-awareness as part of social culture

The results showed that individual awareness of the importance of physical fitness is strongly influenced by cultural values in the environment where students live, including those instilled early on by parents and coaches. Healthy lifestyles, such as dietary management, adequate sleep, and consistency in physical activity, reflect the internalization of disciplinary values. In some cultures, maintaining physical health is considered a moral obligation that impacts not only individual well-being but also the well-being of the community as a whole.

“Ulu...pola hidup sehat tu.... Karena orang tua dan pelatih sering ngeikekan aku, dan jangan malas olahraga”. (student)

(I maintain a healthy lifestyle because my parents and coaches often remind me not to be too lazy to exercise)

Individuals who grow up in an environment that supports a healthy lifestyle tend to have better physical fitness levels. It is due to a balanced diet, regular exercise routines, and emotional support that helps keep them motivated. In addition, such environments often minimize exposure to unhealthy habits, such as excessive fast-food consumption. As a result, such individuals are better able to maintain optimal physical and mental health

Social support from family and friends

The role of family and friends is another factor that supports physical fitness. A family culture that instills healthy living habits, such as providing nutritious food around the house and in the river, supporting physical activity, and providing motivation, has a significant contribution

to individual fitness. In addition, friends who have similar hobbies or are members of physical activity groups also create a positive social environment. In a collective culture, the presence of family and friends is often the main motivating factor to maintain consistency in physical activity.

"aku berlatih lari-lari dengan teman yang sama se-hobi dengan aku" (student)

(I practiced running with my friend who has the same hobby as me)

"Sudah biasa aku nich.... makan sayur 'klakai', 'humbut pekat', yang dimasak ibuku" (student)

(I am used to eating kelakai (Stenochlaena palustris) vegetables cooked by my mother)

"Orang tuaku sering ngasih uang jajan, memberi do'a, bahkan antar jemput latihan" (student)

(My parents often give me allowance, pray for me, and even pick me up and drop me off at practice)

Among all parents, there are some parents who are less supportive (indifferent) towards physical fitness, but students are encouraged to participate in activities by their friends and their physical education teachers, as well as by their surroundings. "My mother and father never talked about or encouraged me to exercise (physical activity), but I am often invited by my friends to play and exercise near my house."

Influence of sociocultural environment

From an early age, the cultural environment also has a significant impact on physical activity habits. For example, the local community continues to preserve the tradition of local cultural games like balogo, bagasing, or "sepak sawut" and basohok (hide and seek). It also includes the experience of performing traditional dances, such as the Dayak cultural creation dance "mohing asang." Physical activity is often a part of these students' everyday routines. Additionally, Dayak people have been eating typical foods since they were young, like "humbut pekat," "kalakai" vegetables, "batuup" yellow soup, "bamboo shoots" with coconut milk, "jelawat" fish, "patin" fish, "seluang" fish, haruan fish, and cassava. Besides, they also commonly eat chicken, fish, and vegetables, which also supports the fulfillment of the nutrients needed to maintain physical fitness. In fact, some students said that during school holidays they often hunted with their father to look for animals, and then the hunting products were used as dinner for the family. In addition to the food intake habit, they are also accustomed to using local traditional transportation modes such as "klotok" and "jukung", which is a boat that is rowed by themselves. Since childhood, they have been riding klotok (rowing boats), walking, and cycling to the market.

"...waktu SD aku pulang sekolah biasa 'ai'.... bermain balogo, bagasing dan juga hamper setiap sore bermain bola dikampung. Itu seru banget. (student)

(When I was in primary school, I used to play balogo, bagasing, and almost every afternoon I played soccer in the village, which was a lot of fun.)

"...biasa 'ai'..... kami makan "seluang", patin, sayur 'klakai'....apa tuh...emm... 'batuup' kuah kuning, 'rebung' santan. (student)

(We often eat seluang fish, catfish, and vegetables like kelakai, yellow soup, and bamboo shoots).

"Kami tu...berangkat sekolah biasa 'ja'... naik "klotok", kadang 'jua' naik motor" sama bapak. (student)

(We often go to school by klotok, sometimes also by motorcycle with my father).

Therefore, cultural traditions that incorporate physical activity and a healthy diet play an important role in shaping optimal physical fitness.

Support from government and teachers

The results show that government support, such as the provision of sports facilities, plays an important role in achieving optimal physical fitness. In addition, teachers in schools who provide physical education in a structured approach also contribute to shaping students' mindset and healthy living habits.

"Guruku sering 'ja' ngajarin di sekolah supaya 'apa tu'.... 'euh'...harus rajin lari 'jar'. Aku juga aktif juga Latihan kesenian daerah/tari dayak (student).

(My teacher often directs us to run/exercise diligently, and besides sports I also sometimes practice traditional arts such as Dayak dancing).

After school, I often play soccer; sometimes I also fly a kite on the soccer field. (student)

In cultures that value the importance of physical education, individuals tend to be more aware of the essence of maintaining physical health through regular physical activity.

The physical fitness of participants or students is on average in the good category in this study and cannot be separated from sociocultural influences. The role of coaches, culturally influenced self-awareness, support from family and friends, local traditions, as well as support from the government and educational institutions form an ecosystem that supports the achievement of physical fitness. Thus, socioculture not only functions as a context, but also as a determinant factor in forming healthy habits that encourage students to achieve optimal physical condition.

This study provides an overview of the role of socioculture in the achievement of physical fitness. These external factors create an ecosystem that supports students to maintain and improve their physical fitness

Discussion

The physical fitness of students who are in the good category cannot be separated from the role of sociocultural influences. Aspects of the coach's role, self-awareness, social support from family and friends, the influence of the sociocultural environment, and the role of the government and teachers are instrumental in shaping the students' physical fitness.

The coach's role in physical fitness development

Coaches have an important role in equipping athletes with social skills early on. By providing athletes with opportunities to understand and deal with social dynamics, they can learn to interact with individuals in a variety of situations, develop effective collaboration skills, and adapt to diverse environments. This approach builds a strong foundation for athletes to achieve success, not only in the sporting arena but also in society (Ingram et al., 2018). Coaches have a big role in developing athletes' potential, not only related to technique, physical and mental, but also character building. Coaches must create an environment where athletes feel valued, motivated, and able to face adversity head-on. In addition to transformational leadership behavior, effective communication, empathetic understanding, and fostering a supportive atmosphere play an important role in shaping the coach-athlete relationship (Karayel et al., 2024).

Coaches are leaders who carry out the coaching process aimed at building and shaping a culture of togetherness in the team (Zhao & Jowett, 2023). The level of knowledge, understanding, and skills of the coach has a direct impact on improving the physical fitness of the students practicing (Jones et al., 2024). This motivates students to achieve ideal physical fitness levels and fosters self-awareness of the importance of exercise.

The role of the coach, in the opinion of the participants in this study, is considered to have a very important role. These results are in accordance with research entitled "The role of transformational leadership in the associations between coach-athlete relationships and team resilience: A study on elite football players". The results of this research concluded that the quality of the coach's leadership significantly impacts the strength of the team (Karayel et al., 2024). Based on the research findings, the strength and success of the team are significantly impacted by the coach's level of leadership. The coach's ability to lead, provide direction, build harmonious relationships with team members, and create an environment that supports cooperation, has proven to be a major factor in improving team performance.

Self-awareness as part of socio culture

According to Leonard (2015), sports culture is a tiny subset of culture overall, yet it serves as a model and a social representative on a larger scale. There are both internal and external elements that impact exercise culture. When someone believes that exercise is a good thing and sees it as a setting that promotes health, character development, and learning values while also having a positive effect on society, they are instilling self-awareness (Weiss et al., 2021). Given

the numerous benefits of sports, particularly the enhancement of physical fitness, it is imperative that personal understanding of the significance of preserving health be further expanded. Based on the results of interviews with participants, individual awareness and the role of parents who always remind them of the importance of a healthy lifestyle can support the achievement of physical fitness. This result is supported by a study entitled “Public awareness of exercise for health improvement and national development, which concluded that public awareness of exercise contributes to the development of individuals and communities that are smart, healthy, skilled, resilient, competitive, prosperous, and dignified (Prasetyo, 2013). Individuals who grow up in an environment that supports a healthy lifestyle tend to have better physical fitness levels.

Social support from family and friends

Physical fitness is influenced by social support from close people such as family and friends. Social support provided by close people plays an important role in influencing sports participation (Sur et al., 2024). Parents who are directly involved with their children in physical activity certainly add motivation to improve physical fitness. One of the benefits that parents can feel from being involved in sports activities with their children is the formation of closer social relationships. For example, parents may experience increased closeness and attachment to their child through the additional time spent together in sporting activities (Clarke et al., 2016).

Based on the results of the interviews, participants said that the family culture has instilled a healthy lifestyle, such as nutritious food and maintaining sleep patterns. In addition, exercising with friends can provide mutual motivation to do physical activity. Friendship in sports plays a positive role for health, increasing their motivation and courage to be themselves when they are with their close friends. This finding is in line with a study entitled “The relationship between quality of sports friendships and mental health in Chinese junior high school students: The bidirectional chain mediating effects of sport motivation and exercise adherence”. The results showed that the quality of friendship in sports and physical exercise activity plays a positive role in supporting adolescents' health, mental and social development. Further, the quality of friendship also has a positive impact on motivation to exercise and discipline in undergoing sports (Li, 2025).

Influence of socio-cultural environment

The sociocultural environment plays an important role in shaping habits and lifestyles related to physical fitness (Amelia, 2023). Social habits, such as lifestyle and level of participation in physical activity, can improve the quality of an individual's physical fitness. Like culture, some regions still preserve traditional culture, such as small games that are usually done to fill spare time. Culture has a significant influence on physical fitness through social norms, values, and cultural practices that influence individual physical habits. In many cultures, the value of the ideal body and physical activity can encourage individuals to engage in exercise and keep their bodies healthy. Cultural traditions that support physical activity, such as dance or martial arts, also contribute to improving physical fitness in various societies (Oja et al., 2022). Therefore, physical fitness is not only influenced by biological factors but also by the cultural context that shapes habits and perceptions towards the body and exercise in a community.

Support from government and teachers

Physical education is an integral part of education. It is essential for the development of all children, including cognitive, emotional, social, and health aspects (Latha, 2020). It is useful for students by providing opportunities to engage directly in sports, thus creating new experiences that are more beneficial for students (Chu & Zhang, 2018). The participants stated that teachers require students to participate in extracurricular activities. It is intended for students to do physical activity with the aim of improving physical fitness. Teachers have an important role as facilitators and motivators in the learning process.

Here, the important role of physical fitness is reinforced by a study entitled “Physical activity and physical fitness as predictors of students' physical education learning achievement,” which concluded that there is a significant relationship between physical activity and physical

fitness with students' physical education learning achievement. Students' physical activity contributes directly to their success in learning, while physical fitness also plays an important role in improving that achievement. The combination of the two showed a significant impact on student achievement in physical education subjects, indicating the importance of maintaining a balance between physical activity and fitness to support successful academic achievement (Saputra, 2023).

The facilities and infrastructure provided by the local government also influence physical activity. Based on interviews, the participants stated that the available field in the village area is used for playing in the afternoon. Playing activities are identical to activities that involve movement and are fun to support the improvement of physical fitness. It is in line with research entitled "The influence of physical learning sports and health and the availability of sports facilities and infrastructure on students' physical fitness," which showed a significant influence between physical education, sports and health, and the availability of sports facilities and infrastructure on the physical fitness of junior high school students in Babat District (Shalahudin & Sifaq, 2023).

CONCLUSION

This study reveals that the physical fitness levels of high-achieving student-athletes (PON students) in schools near watershed areas fall within the good category. This achievement is significantly supported by sociocultural factors shaping the students' lives. Key contributing factors include role of coaches; self-awareness & family influence; social support; sociocultural environment; and school & government roles. Students' physical fitness development results from the synergistic collaboration of individual and environmental elements. This holistic approach not only improves physical fitness but also fosters social skills, mental resilience, and character traits—ultimately shaping healthy, disciplined, and productive individuals. These findings provide deeper insight into the critical role of sociocultural determinants in student fitness. By better understanding contributions from coaches, families, sociocultural environments, teachers, and peers, this research can inform evidence-based policies to enhance physical education quality at school and community levels. The goal is to cultivate supportive ecosystems for student fitness development, nurturing a generation that is healthy, disciplined, and productive through culturally relevant strategies.

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