



The Implications of Traditional Sagi Boxing on Students' Physical Fitness: A Phenomenological Study

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ABSTRACT

Purpose - This study aimed to explore students' experiences of traditional Sagi boxing practices and examine their implications for physical fitness. The research background is based on the low level of physical fitness among Indonesian students and the need for local wisdom-based innovations in physical activity.

Methodology - The study employed an exploratory mixed-methods design with an emphasis on the phenomenological approach. Qualitative data were collected through in-depth interviews, participatory observation, and documentation of students actively practicing Sagi boxing in So'a Sub-district. Quantitative data were obtained through physical fitness measurements using the Indonesian Student Fitness Test.

Findings - Students interpreted Sagi boxing not only as a cultural tradition but also as a physical activity that benefits fitness and mental balance. TKSI data indicated that the majority of participants' physical fitness fell within the fair to good category.

Contribution - This study concludes that Sagi traditional boxing has excellent potential as an alternative activity to support students' physical fitness while preserving local culture. The findings provide a foundation for integrating traditional sports into physical education curricula.

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INTRODUCTION

Physical fitness is one of the essential pillars in shaping the quality of human resources and ensuring sustainable national development. Globally, the World Health Organization (2020) and UNESCO (2022) agree on one thing: physical literacy, a blend of motivation, confidence, physical competence, and real understanding of how to keep moving for life, is a significant factor in staying healthy, doing well in school, and feeling connected to others. However, research consistently shows a global decline in physical activity among children and adolescents, particularly in developing countries, where modernization and digital

lifestyles have led to a reduction in daily physical activity (Guthold et al., 2020; Tremblay et al., 2022).

Indonesia faces a similar challenge. According to the Ministry of Youth and Sports (2023), 77.12% of Indonesian children aged 10–15 and fully 83.53% of young people aged 16–30 currently fall within the “low” or “very low” categories of physical fitness. Key contributing factors include widespread sedentary lifestyles, excessive screen time, and the continuing scarcity of structured physical activity within the school system (Wiriawan, 2022; Prasetyo et al., 2021). Such trends pose a serious obstacle to achieving Indonesia Emas 2045, the country’s ambitious vision of building a healthy, highly educated, and globally competitive generation by the nation’s centennial. Consequently, there is an urgent need to develop and implement innovative, culturally appropriate, and sustainable approaches that can effectively improve physical fitness levels among students.

In Indonesia, the majority of existing physical fitness programs continue to rely heavily on Western sport models that prioritize competitive performance and rigid organizational structures, often at the expense of cultural relevance. By contrast, traditional games and sports, commonly referred to as *ethnosports*, seamlessly integrate physical exertion with deeply rooted community values and cultural identity (Martínková & Parry, 2023). On the global stage, *ethnosports* have garnered growing interest as a promising means of developing physical literacy through movement practices that resonate with local heritage (Carl et al., 2022; Durden Myers & Whitehead, 2024). Despite this recognition, rigorous empirical studies examining the specific contribution of traditional sports to objectively measured physical fitness remain scarce, particularly in Southeast Asian settings.

Among the rich array of traditional physical practices found across Indonesia, *Sagi*, a traditional boxing form of the So’a ethnic community in East Nusa Tenggara, stands out for its dual role as both ritual performance and competitive sport. Although previous scholarship has carefully explored the historical origins and profound symbolic meanings of *Sagi* (Bile, Tapo, Wani, et al., 2024), the physiological and psychological effects of regular participation in *Sagi* have yet to be systematically investigated or scientifically validated. Consequently, the research gap lies in understanding how engagement in *Sagi* boxing contributes to students’ physical fitness and embodied experiences, and how this practice can be framed as a culturally grounded model of physical literacy.

This study employs a phenomenological approach within an exploratory mixed-methods design to capture students’ lived experiences of practicing *Sagi* boxing. Phenomenology was chosen for its ability to uncover embodied meaning and subjective consciousness that cannot be captured through quantitative measurements alone (Hossain, 2024; Bingham, 2023). Combining phenomenological perspectives with objective physiological testing offers a far more complete picture of how traditional movement practices shape not only measurable fitness outcomes but also the deeply felt, lived experience of physical engagement. This mixed-method approach marks a significant departure from the prevailing trend in Indonesian *ethnosport* research, which has thus far leaned heavily toward descriptive anthropological accounts and rarely ventured into the realm of embodied experience (Martínková & Parry, 2023; Goss & Lee, 2022).

The revitalization of traditional sports aligns closely with Indonesia’s broader cultural preservation and educational priorities. By weaving indigenous physical activities into the school curriculum, educators can simultaneously promote physical health, strengthen students’ sense of national identity, and help safeguard cultural heritage for future generations (Setyorini et al., 2022; Kim et al., 2021). Within the overarching vision of Indonesia Emas 2045, practices such as *Sagi* traditional boxing have the potential to serve as powerful vehicles for instilling core values of discipline, courage, mutual respect, and collective responsibility that are indispensable to the holistic development of the nation’s youth. Scientifically validating *Sagi* boxing as a form of physical education innovation will thus contribute to both local cultural preservation and the global discourse on culturally responsive physical literacy.

This study aims to explore students’ lived experiences in practicing traditional *Sagi* boxing and to examine its implications for physical fitness development. Specifically, the objectives are: 1) To describe students’ perceptions and embodied experiences of physical and psychological transformation through *Sagi* boxing practice; and 2) To analyze the fitness components influenced by these practices using the Indonesian Student

Fitness Test (TKSI). Through these objectives, this study aims to deepen the international body of knowledge on ethnosport while providing concrete evidence that culturally rooted movement practices can meaningfully enhance both physical literacy and overall fitness levels among school-aged students.

METHODOLOGY

Research Design

This study employed an exploratory mixed-methods design, with a particular emphasis on qualitative phenomenological approaches. We selected this framework to harness the descriptive power of quantitative data alongside the rich interpretive insights offered by qualitative exploration (Bingham, 2023). The investigation proceeded in a sequential manner: the initial qualitative phase explored students' lived experiences and personal perceptions of engaging in traditional Sagi boxing. In contrast, the subsequent quantitative phase provided corroborating evidence through objective fitness assessments. At the interpretation stage, we integrated findings through triangulation, with qualitative data shedding light on the "how" and "why" behind perceived shifts in physical fitness, and quantitative data outlining the "what" in terms of observed fitness levels. This overall design aligns closely with Creswell's (2024) guidance, which suggests that exploratory sequential mixed methods are especially suitable for cultivating a nuanced, context-bound understanding that remains firmly anchored in participants' own experiences.

Participants

The study involved 26 students aged 10–17 years, drawn from seven villages across So'a Sub-district in Ngada Regency, East Nusa Tenggara. Participants were recruited through purposive sampling (Ahmad & Wilkins, 2024; Nyimbili & Nyimbili, 2024), guided by the following inclusion criteria: (1) at least one year of active engagement in traditional Sagi boxing, (2) current enrollment in elementary, junior high, or senior high school, and (3) willingness to participate, supported by written parental or guardian consent.

The limited number of participants reflects the actual population of school-aged children who actively engage in traditional Sagi boxing. This indigenous practice is not organized as a formal sport but as part of a cultural ritual, meaning that only a small number of students in each village regularly participate in such events. Therefore, the 26 students involved in this research represent the total accessible population who met the criteria within the So'a community. Although the sample size of 26 may appear modest from a purely quantitative perspective, it remains entirely appropriate and even standard for phenomenological research. In this tradition, the priority is to capture the depth and richness of lived experience rather than to achieve statistical generalizability (Czernek-Marszałek & McCabe, 2024). Every participant had taken part in traditional Sagi boxing regularly for at least one full year, so their accounts were rooted in authentic and repeated immersion in the practice. Most participants had acquired their technical skills informally through prolonged observation of elders and peers, imitation, and unstructured play, rather than through organized coaching. This organic, community-driven mode of learning reflects the typical pattern of cultural and physical knowledge transmission within the So'a tradition and emerged as a crucial factor in interpreting the study's findings.

Data Collection

Data collection followed an integrative, context-sensitive approach deliberately crafted to reflect the multifaceted nature of traditional Sagi boxing, which is both a physical practice and a cultural expression. Data were gathered over three months, from June to August 2024, across several villages in the So'a Sub-district of Ngada Regency communities where the Sagi tradition remains actively practiced. The researcher immersed themselves in the field to observe both formal ritual events and informal practice sessions, thereby gaining a holistic understanding of how students engaged in Sagi boxing within their everyday social environment. Three primary methods were employed: interviews, observations, and physical fitness assessments, each complementing the others in purpose and outcome. Semi-structured interviews were conducted with three

distinct groups: student participants, experienced adult practitioners, and respected traditional leaders. In this study, the practitioners were adult male boxers with extensive experience who continued to compete actively in Sagi matches throughout the research period. Their accounts offered valuable insight into the embodied techniques, physical endurance, and mental discipline demanded by the tradition. The traditional leaders, known locally as *tetua adat*, were elder figures vested with complete authority over the organization and conduct of Sagi rituals. They oversaw the planning of events, enforced sacred customary rules, and played a central role in transmitting cultural values and knowledge to younger generations. The inclusion of these three groups ensured that the study represented both the experiential and cultural dimensions of Sagi boxing as a living tradition.

The interviews focused on exploring participants' motivations, personal experiences, perceived physical and psychological effects, and interpretations of meaning associated with their participation. Interviews lasted between 30 and 45 minutes each and were conducted in a relaxed yet respectful conversational style. This approach provided participants with ample space to express their thoughts spontaneously, while ensuring that cultural sensitivities were consistently observed. Concurrently, the researcher conducted extended participatory observations to capture the behavioral dynamics, ritual atmosphere, and overall social context of both regular training sessions and formal competitions. Observations took place across several Sagi boxing events held in village courtyards and open community fields, during which detailed field notes were recorded, photographs were taken, and short video clips were collected for subsequent analysis. These observations provided valuable insights into movement rhythm, body coordination, audience interaction, and community involvement elements that were crucial to understanding Sagi boxing not merely as a physical activity but as a social and cultural phenomenon.

To complement the qualitative data, quantitative information was collected through the Indonesian Student Fitness Test. The test was administered once for each participant group, elementary, junior high, and senior high levels, covering six essential components of fitness: speed, endurance, agility, muscular strength, coordination, and balance. A single fitness testing session was considered sufficient and ethically preferable, as multiple sessions would have interfered with the community's ritual calendar and risked altering participants' habitual activity patterns through the Hawthorne effect. By conducting only one round of tests, the results more accurately reflected the genuine fitness levels that students had developed through everyday engagement with Sagi boxing rather than through short-term training or external pressure. The combined use of participatory observation, semi-structured interviews, and objective physical testing enabled robust methodological triangulation, thereby strengthening the credibility, trustworthiness, and overall richness of the findings. Each method complemented the others, yielding a well-rounded depiction of both the measurable physiological outcomes and the deeper cultural meanings that students attached to Sagi boxing within their lived community settings.

Instrument

To ensure the reliability and richness of the data, the study employed a set of carefully developed instruments that addressed both the cultural and physiological dimensions of the Sagi boxing tradition. Structured observation checklists were used to systematically document key elements of student involvement, including patterns of movement execution, intensity and duration of bouts, levels of active participation, and relevant environmental and contextual factors during both ritual events and regular practice sessions. These records helped reveal how Sagi's embodied actions in boxing reflected both physical training and cultural symbolism. In addition, a semi-structured interview guide was developed to explore participants' lived experiences in greater detail. Interview questions were structured around four central dimensions: (1) participants' motivation and personal experiences with Sagi boxing, (2) their perceptions of its physical and psychological effects, (3) the cultural significance they attributed to the practice, and (4) their views on the potential incorporation of traditional boxing into formal school-based physical education. To strengthen the descriptive record, the researcher maintained detailed field notes and collected photographs and brief video

recordings throughout the observation periods. These materials provided essential visual and contextual evidence that complemented the interview transcripts and observational checklists, especially when analyzing movement sequences, spatial arrangements, and ritual atmosphere. For the quantitative component, physical fitness was assessed using the standardized Tes Kebugaran Siswa Indonesia (TKSI) protocol, a nationally recognized instrument for evaluating student fitness levels in Indonesia. The TKSI assessed six components: speed, endurance, agility, muscular strength, coordination, and balance, providing quantitative data that complemented the qualitative findings. Before implementation, all instruments were pilot-tested with three non-participant students to ensure clarity of instruction, procedural validity, and cultural appropriateness for the local context.

Data Analysis

Qualitative data were analyzed using a phenomenological thematic approach adapted from Hossain (2024). The process began with an extended immersion phase, in which the researcher repeatedly read the interview transcripts and listened to the audio recordings to become thoroughly familiar with the participants' expressed meanings and emotional undertones. Significant statements related to physical fitness, bodily movement, and cultural experience were then extracted, coded line by line, and grouped into preliminary categories. Through an iterative process of comparison and refinement, these initial categories were subsequently clustered into broader, overarching themes that captured recurring patterns and shared dimensions of experience across the participant cohort. From these clustered themes, both textural and structural descriptions were constructed to represent *what* the participants experienced and *how* those experiences unfolded within their sociocultural environment. Finally, these descriptions were synthesized into a collective narrative that captured the essence of students' lived experiences in traditional Sagi boxing. To strengthen the credibility of the findings, *source triangulation* was applied across three groups of informants: students, practitioners, and traditional leaders. *Method triangulation* was ensured through the use of interviews, observations, and documentation. Quantitative data obtained from the TKSI were analyzed descriptively to identify trends and distributions in physical fitness performance across age groups. The integration of qualitative and quantitative data took place during the interpretation stage. Objective fitness scores from the TKSI were directly compared with participants' own descriptions of their physical and psychological changes. Where the test results revealed clear strengths in agility and endurance, the interviews explained the underlying reasons: frequent informal play and the intensity of ritual performance naturally honed those abilities. Slightly lower coordination scores, in turn, matched the students' accounts of learning, which mainly occurred through observation rather than structured practice. This deliberate interplay between measured outcomes and personal narratives yielded a much richer and more coherent understanding than either method could provide in isolation. It demonstrated that traditional Sagi boxing simultaneously develops measurable physical fitness and strengthens cultural identity, illustrating in tangible terms how movement, health, and belonging are deeply interconnected in the everyday lives of the So'a community.

FINDINGS

Before presenting the findings, it is necessary to clarify that the data in this study were derived from both quantitative fitness assessments using the Indonesian Student Fitness Test (TKSI) and qualitative data obtained through interviews and observations. Three groups of participants were involved: (1) school-age students practicing traditional Sagi boxing, (2) practitioners, adult male boxers actively participating in the ritual matches, and (3) traditional leaders (*tetua adat*) who managed and preserved the cultural ceremony. This triangulation of interviews, participatory observations, field documentation, and standardized fitness measurements yielded a far richer and more nuanced understanding of Sagi boxing than any single method could have provided alone. It illuminated both the measurable physiological benefits and the intensely lived, culturally embedded experiences of the young participants, revealing how traditional practice simultaneously shapes bodies, minds, and identities within the So'a community.

Findings from Interviews with Student Practitioners of Sagi Boxing

The key findings that emerged from interviews with the student participants are summarized in the table below.

Table 1. Key Themes Emerging from Interviews with Student Participants in Traditional Sagi Boxing

Theme	Key Findings	Representative Quotes
Learning and Engagement Patterns in Traditional Sagi Boxing	Students learned Sagi boxing through an entirely unstructured, self-directed process, based on observing elders, imitating them, and engaging in playful peer sparring. Formal coaching was absent; skills developed naturally from early childhood through repeated community exposure and spontaneous practice.	"I learned from my older brother. I would watch him practice, and then when I was playing with my friend, I just started trying it myself."
Emotional and social experiences	Felt nervous and scared before and during bouts, yet experienced great pride when competing in the arena.	"I was literally shaking the first time. However, as soon as the crowd started cheering, I suddenly felt confident."
Physical and mental impacts felt	Stronger, faster, less fatigued, and mentally braver.	"I did not participate in training, but when I finished boxing, I felt light and strong."
Value learned	Courage, responsibility, cultural pride.	"If you can hit your opponent and you do not get hit, it feels good, and your parents and family who are watching are also proud. That gives me the courage to fight again."

Interviews were conducted with twelve student participants aged 10–17 years who had been actively involved in Sagi boxing for at least one year. The students represented all educational levels, including elementary, junior high, and senior high school, and were selected to capture a variety of developmental experiences. Interviews were conducted in familiar and relaxed settings, such as village courtyards, school playgrounds, and open fields, where Sagi's practice typically occurs. Using a conversational tone and lasting 30 to 45 minutes each, the sessions allowed students to speak freely while often sitting together in small groups or watching younger children play nearby. Thematic analysis of the transcripts revealed four major themes. The first two themes were learning and engagement patterns, together with emotional and social experiences. Students consistently described acquiring Sagi boxing skills through informal, self-directed observation of older siblings, peers, or local fighters, followed by experimentation during play. This spontaneous, observation-based model is typical of indigenous physical practices. Emotionally, they progressed from initial nervousness and fear before and during bouts to heightened confidence and pride spurred by community encouragement. This process repeatedly built emotional resilience and social self-assurance over time.

The third theme centered on perceived physical and mental impacts, with students consistently reporting greater stamina, strength, speed, and mental courage; many emphasized that they felt noticeably stronger, quicker, and far less prone to fatigue after bouts, confirming that even unstructured participation in Sagi boxing yields significant physiological conditioning and psychological benefits. The fourth and final theme revolved around the values internalized through the practice: participants repeatedly spoke of acquiring a more profound sense of responsibility toward the community, pride in representing their village, courage when facing opponents, and respect for elders and ritual customs, values they consciously carried beyond the arena into everyday school and family life.

These findings demonstrate that Sagi boxing serves as an experiential learning platform where physical activity, cultural identity, and character development intersect, forming a comprehensive foundation for holistic education.

Results of Interviews with Traditional Leaders

The results of interviews with traditional leaders are outlined in the following table.

Table 2. Summary of Interviews with Traditional Leaders

Theme	Key Findings	Representative Quotes
Cultural and historical significance	Part of the traditional rites as a form of gratitude and brotherhood.	"Sagi is not just about boxing. It is our way of thanking God for life and honoring our ancestors who passed down this tradition." - T1.
Philosophical value	Sportsmanship, self-control, and limits in strength.	"Sagi's boxing is not merely a matter of winning or losing. However, sagi boxers must know emotional control and also respect their opponents. That is why after every boxing round the two sagi boxers are immediately directed to hug each other, it is a symbol of peace." - T2.
Generational change and social support	Supported by the community, but the interest of young people tends to decline.	"In the past, children of elementary, middle, and high school age were eager to participate in sagi boxing. Nowadays, many prefer to play on cellphones. When boxing sagi in the village, they come mostly to watch." - T3.

Interviews were conducted with five traditional leaders (tetua adat) in the customary meeting houses (sa’o) and village courtyards, which serve as the heart of community decision-making and ritual preparation. These elders, each having led the annual Sagi ceremonies for at least five consecutive years, were chosen for their recognized authority as guardians of customary law and moral order. Selected with care because of their deep involvement in organizing the events, they spoke openly after the customary exchange of greetings and betel nut. From their accounts, three broad themes emerged that underscored the profound role Sagi boxing continues to play in So’a society.

The leaders first stressed the deep cultural and historical significance of the ritual: far from being just a physical contest, Sagi is an act of thanksgiving to God and a way of honoring ancestors, while strengthening bonds of brotherhood and ensuring generational continuity. They then described its philosophical and ethical core, explaining that true strength in Sagi is always tempered by sportsmanship, self-control, and respect for the opponent; every bout ends with an embrace that signals reconciliation and peace. Finally, they expressed concern about generational change. Although community support for the ritual itself remains strong, fewer young people now actively participate, mainly due to the allure of smartphones and other modern distractions. Despite this trend, the elders remain hopeful that deliberate cultural and educational efforts can bring school-aged children back to the tradition. Taken together, their insights portray Sagi boxing as a living system that weaves together physical practice, spiritual meaning, moral discipline, and communal identity.

Interview Results with Sagi Boxing Practitioners

Interviews were conducted with six adult male practitioners aged 21–38 years, all of whom had more than five years of active involvement in Sagi traditional boxing. These practitioners were selected because of their consistent participation in annual rituals and their informal roles as mentors to younger participants. The interviews were held in open village fields (*kanga*) and communal gathering areas, typically conducted informally in the afternoons following daily activities. This relaxed environment allowed for reflective and detailed discussions about their experiences and perspectives. Analysis of the interview data identified three

central themes. The first theme, training and mentoring patterns, revealed that Sagi's boxing does not follow a structured or regular training program. Instruction occurs spontaneously, often just before the ritual event, while most young participants learn through self-practice and peer interaction. This indicates that the development of skills in Sagi boxing relies heavily on imitation, observation, and autonomous learning within a social context, reflecting the organic transmission of physical culture through lived experience. The results of interviews with practitioners of traditional sagi boxing are outlined in the following table.

Table 3. Summary of Interviews with Traditional Leaders

Theme	Key Findings	Representative Quotes
Training and mentoring patterns	There is no regular program.	"There is no routine training. We usually only direct them the day before they perform. Mostly the kids practice on their own with their friends" – P1.
Impact on fitness and character	Increase strength, endurance, courage, and discipline.	"Usually, children who participate in sagi are physically more resilient. They do not back down or give up easily. Mentally, they are stronger because when they box, the audience is large and shouting, they have a name, so they are used to it." – P2
Future hoping	It should be included in physical education, school activities, and cultural groups or centers.	"If it can be taught in schools, so that children are better prepared and understand the tradition of sagi boxing. If someone can create a cultural studio, it would be better so that it can be a place for young people to learn and practice sagi boxing for attractions, so that they always remember not only to wait later when they want a sagi ritual in the village." – P3.

The second theme centered on the perceived impact of Sagi's boxing on both fitness and character. Practitioners consistently noted that regular involvement builds noticeable physical strength, endurance, and mental toughness in the younger participants. More importantly, they observed that students who take part in Sagi display greater resilience, self-discipline, and confidence not only in the arena but also in everyday social situations. In their view, this close link between physical effort and character development lies at the heart of indigenous sporting traditions.

The third theme revolved around future expectations. All five practitioners strongly supported incorporating Sagi boxing into both formal and non-formal education, whether by adapting it for school physical education curricula or by establishing dedicated community centers where children and youth could train under safe, supervised conditions. They saw this integration as the most effective way to preserve a cherished cultural practice while turning it into a practical tool for promoting physical health, strengthening cultural identity, and instilling lasting moral values. Taken together, their accounts present Sagi boxing as a richly layered tradition that quietly functions as rigorous physical training, a school of moral discipline, and a vital anchor for cultural continuity.

Participatory Observation Results

The participatory observation was conducted over a period of three months, coinciding with the preparation, implementation, and post-event phases of the annual Sagi ritual in So’a District, Ngada Regency, East Nusa Tenggara. Observations were conducted in village fields (kanga), training areas, and community gathering sites, where activities related to Sagi boxing frequently occurred. The purpose of the observation was to gain a comprehensive understanding of how Sagi boxing functions in the daily lives of participants, particularly in terms of physical preparation, ritual performance, emotional involvement, and community interaction. Through direct participation, the researcher documented behavioral patterns, movement

dynamics, and social exchanges that occur before, during, and after the matches. The observation focused on four main aspects: physical performance, emotional expression, social interaction, and cultural symbolism. The following table presents a summary of key findings derived from field notes and observation journals.

Table 4. Key Findings

Aspect Observed	Observation Description	Interpretation
Physical Performance	Participants demonstrated strong agility, coordination, and endurance, even without structured training. Movements were spontaneous yet controlled, showing efficient use of energy and spatial awareness.	Indicates that <i>Sagi</i> boxing develops physical literacy through informal, embodied learning experiences.
Emotional Expression	Emotional transitions were visible before and after matches—nervous anticipation, heightened excitement during combat, and calm reflection afterward.	Reflects effective emotional regulation fostered through repeated exposure to high-pressure cultural performance.
Social Interaction	Supportive interactions among peers and guidance from senior fighters or elders were consistently observed. Mutual respect and cooperation dominated social exchanges.	Demonstrates that <i>Sagi</i> serves as a medium for social cohesion and intergenerational transmission of values.
Cultural Symbolism	Ritual gestures, traditional chants, and ceremonial attire were performed consistently before and after matches. The post-bout embrace symbolized peace and unity within the community.	Highlights the integration of spirituality and morality in the <i>Sagi</i> tradition, reinforcing collective identity.

Overall, the participatory observations suggest that *Sagi* boxing functions not merely as a physical event but as a culturally embodied practice that may contribute to the development of physical competence, emotional maturity, and moral consciousness among its participants. The observed patterns indicate a potential role of this tradition in supporting both physical fitness and psychological well-being, particularly through its emphasis on discipline, emotional regulation, and social connection. While further empirical investigation is needed to substantiate these relationships, the findings underscore that *Sagi* boxing represents a significant intersection between culture, the body, and community health.

Physical Fitness Measurement Results

A total of 26 students participated in boxing *sagi*, namely six elementary school students (grades 5-6), 10 junior high school students, and 10 high school students. Took physical fitness measurements using the Indonesian Student Fitness Test.

Table 5. C Phase Fitness Test Results (n=6)

Components	Categories					Score Average
	Very Less	Less	Simply	Good	Very Good	
Accuracy (Tok-tok Ball)	0 (0%)	0 (0%)	1 (16,7%)	5 (83,3%)	0 (0%)	4,2
Coordination (Child Ball Test)	0 (0%)	1 (16,7%)	4 (66,7%)	1 (16,7%)	0 (0%)	3,1
Agility (Shuttle run)	0 (0%)	0 (0%)	1 (16,7%)	5 (83,3%)	0 (0%)	4,2
Muscle strength (Move the ball)	0 (0%)	0 (0%)	1 (16,7%)	5 (83,3%)	0 (0%)	4,0
Cardiovascular endurance	0 (0%)	1 (16,7%)	1 (16,7%)	4 (66,7%)	0 (0%)	4,1
Average Classical Score Phase C Categories						3,92 Good

Table 5 presents the results of the fitness test for participants categorized in the C Phase, consisting of six students who actively participated in *Sagi* boxing. The quantitative fitness assessment showed a group average of 3.92 on the Tes Kebugaran Siswa Indonesia (TKSI), placing participants firmly in the “good” category. They scored particularly well in agility, accuracy, and cardiovascular endurance, with each component exceeding an average of 4.0. These results match the specific demands of *Sagi* boxing, which requires quick changes of direction, precise strikes, rapid defensive reactions, and sustained effort across multiple rounds, even when practiced informally.

Coordination, as measured by the child ball-transfer test, was the only component that lagged slightly behind the others. However, the overall fitness profile remained balanced and well above the “low” or “very low” levels commonly reported among Indonesian students in national surveys. This respectable performance occurred in the complete absence of structured training, indicating that habitual, community-driven participation in *Sagi* boxing can deliver meaningful and natural physical conditioning.

Given the small sample size, the findings should be viewed as suggestive rather than definitive. Nevertheless, they provide initial evidence that traditional *Sagi* practice effectively supports the development of crucial fitness elements, particularly agility and endurance, which are vital for the long-term health of children and adolescents.

Table 6. D Phase Fitness Test Results (n=10)

Components	Categories					Score Average
	Very Less	Less	Simply	Good	Very Good	
Explosive Power (Standing broad jump)	1 (10%)	1 (10%)	2 (20%)	5 (50%)	1 (10%)	3,5
Muscle strength (sit up)	0 (0%)	2 (20%)	4 (40%)	3 (30%)	1 (10%)	3,6
Cardiorespiratory endurance (Bleep test)	1 (10%)	2 (20%)	4 (40%)	2 (20%)	1 (10%)	3,5
Hand Eye Coordination	1 (10%)	2 (20%)	3 (30%)	3 (30%)	1 (10%)	3,4
Agility (T-test)	2 (20%)	3 (30%)	3 (30%)	1 (10%)	1 (10%)	3,0
Average Classical Score Phase D						3,58
Categories						Simply

Table 6 summarizes the fitness test results for the D Phase group, consisting of ten students who regularly participate in *Sagi* boxing activities. The overall average classical score was 3.58, which falls into the “sufficient” category. Although lower than the C Phase results, this score still reflects a generally adequate level of physical fitness among participants. The test outcomes indicate moderate to good performance across most components, with muscle strength and explosive power achieving the highest averages (3.6 and 3.5, respectively). These components are closely related to the repetitive striking and jumping actions typical of *Sagi* boxing, suggesting that even irregular participation may stimulate the development of muscular endurance and lower-body power.

Meanwhile, cardiorespiratory endurance and hand–eye coordination also demonstrated relatively stable results, which can be associated with the dynamic and reaction-oriented nature of the boxing movements performed during traditional matches. However, agility displayed a relatively lower score (3.0), indicating that participants in this phase may have less refined movement transitions and spatial reaction compared to the younger C Phase group. This difference could be attributed to less frequent practice, irregular exposure to ritual events, or lifestyle factors outside the training context.

Overall, the D-Phase data suggest that participation in *Sagi* boxing contributes positively to maintaining several domains of physical fitness, particularly strength, coordination, and endurance. However, the effects appear less pronounced without consistent engagement. These results highlight the potential of *Sagi* boxing

as an informal physical activity that supports basic fitness maintenance, while also underscoring the importance of structured physical education to optimize outcomes.

Table 7. EF Phase Fitness Test Results (n=10)

Components	Categories					Score Average
	Very Less	Less	Simply	Good	Very Good	
Coordination (Hand-eye coordination test)	0 (0%)	1 (10%)	2 (20%)	5 (50%)	2 (20%)	3,6
Explosive power (Standing broad jump)	1 (10%)	1 (10%)	4 (40%)	3 (30%)	1 (10%)	3,7
Agility (T-test)	1 (10%)	3 (30%)	4 (40%)	1 (10%)	1 (10%)	2,9
Arm and shoulder muscle endurance (Dipping test)	0 (0%)	1 (10%)	2 (20%)	4 (40%)	3 (30%)	3,8
Cardiorespiratory endurance (Multi-stage fitness test)	1 (10%)	4 (40%)	3 (30%)	1 (10%)	1 (10%)	2,7
Average EF Phase Classical Score						3,54
Categories						Simply

Table 7 presents the fitness test results for the E-F Phase group, comprising ten older student participants who had previously engaged in *Sagi* boxing activities. The overall average classical score was 3.54, categorized as “sufficient.” This result reflects a moderate level of physical fitness, suggesting that while the participants maintain certain aspects of functional ability, their overall fitness levels may be influenced by reduced participation intensity or less frequent involvement in *Sagi* boxing rituals. Among the tested components, the highest mean scores were observed in arm and shoulder muscle endurance (3.8) and explosive power (3.7), indicating that these participants still possess relatively good upper-body strength and lower-limb power. These attributes align with the physical demands of *Sagi* boxing, where repetitive striking, guarding, and movement transitions naturally engage the upper and lower musculature. Similarly, coordination also showed a positive outcome (3.6), reflecting the persistence of motor control skills developed through experience in the ritual activity. Conversely, agility (2.9) and cardiorespiratory endurance (2.7) recorded the lowest average scores, implying a possible decline in dynamic movement response and aerobic capacity. This reduction may correspond to participants' aging stage or a decrease in the frequency of practice following the completion of earlier ritual involvement. Such findings are common in traditional physical activities that are performed episodically rather than through systematic training. Overall, the E-F Phase results suggest that while *Sagi* boxing can help sustain certain domains of physical fitness, particularly muscular endurance, coordination, and power, its sporadic nature may limit improvements in agility and aerobic capacity. These patterns suggest the potential value of integrating *Sagi*-inspired exercises into structured training or physical education contexts to promote both cultural engagement and physical health.

DISCUSSION

This study demonstrates that traditional *Sagi* boxing offers far more than a simple physical workout. It functions as a culturally anchored practice that simultaneously builds physical fitness, reinforces local values, and fosters psychological resilience, particularly among school-aged participants (Sudarwo et al., 2023). By combining objective fitness measurements with in-depth qualitative inquiry, the research sheds light on how active, embodied involvement in *Sagi* shapes both the physiological capabilities and the broader psychosocial development of young people within the So’a community.

Insights from Traditional Sagi Boxing Among So'a Youth

Results from the Tes Kebugaran Siswa Indonesia (TKSI) revealed that the physical abilities most heavily recruited in Sagi boxing (strength, agility, endurance, balance, and accuracy) fell predominantly within the "good" or "sufficient" categories across all age groups (Cheong & Hussain, 2024). Younger participants, however, consistently outperformed older ones in agility and endurance. Qualitative accounts clarified the reason: children in the lower grades still participated in informal play and ritual preparations almost daily, whereas junior and senior high school students were increasingly drawn away by schoolwork and other commitments. The pattern indicates that sustained, even unstructured engagement in Sagi boxing is enough to preserve solid motor performance and overall fitness levels, lending support to broader research showing that culturally meaningful movement practices can deliver measurable health benefits without the need for formal training programs (Heinrich et al., 2023; Striga, 2024; Bélanger et al., 2022).

Physiologically, students who regularly practiced Sagi demonstrated respectable abdominal strength, coordination, and cardiovascular endurance (Srivastava et al., 2024), reinforcing the idea that spontaneous, community-based activity can drive healthy physical development just as effectively as structured exercise. More importantly, these findings align with growing scholarship that views traditional sports not simply as cultural relics but as living educational spaces where body, mind, and sociocultural identity develop together (Fitri et al., 2024; Martínková & Parry, 2023). In the case of Sagi, the same ritual that expresses gratitude to ancestors and reinforces village unity also functions as a highly effective, natural training system that builds endurance, sharpens motor coordination, and deepens cultural embodiment simultaneously (Hudain et al., 2024; Helén et al., 2023).

Emotional and Psychological Aspects of Traditional Practices

Sagi boxing extends well beyond mere physical exercise by creating a mentally stimulating space that helps build emotional restraint, self-assurance, and a sense of shared identity (Arfanda et al., 2024). Newcomers frequently face initial feelings of unease and tension, particularly in front of large crowds; yet, over time, repeated involvement helps cultivate calmness and bravery, qualities that play a key role in shaping one's personality. These observations align with the work of Chen et al. (2024) and Gao et al. (2024), which demonstrate how physically demanding activities with an emotional component can enhance self-management and resilience in learners. From a phenomenological perspective, these feelings indicate embodied learning, where individuals absorb cultural and emotional principles through direct physical engagement (Durden-Myers & Whitehead, 2024; Standal & Moe, 2022). In essence, Sagi boxing can serve as an organic pathway for emotional and social growth, complementing its contributions to overall bodily health.

Phenomenology Meets Global Research on Traditional Physical Practices

This study breaks new ground methodologically by placing lived experience at the centre of its analysis. Rather than treating physical fitness as a set of numbers alone, it adopts a phenomenological lens to capture the layers of meaning, emotion, and cultural identity that students and elders attach to Sagi boxing (Bile, Tapo, & Bali, 2024; Bile, Tapo, Wani, et al., 2024). Extended participatory observation revealed something that laboratory tests could never show: for participants, Sagi is far less about winning than about enacting moral discipline within a sacred communal ritual. By keeping body and culture in the same frame, the approach adds interpretive richness to sport science in a way that purely physiological studies rarely achieve.

These insights find clear echoes in research from other cultural contexts. Lee and Ha (2023) describe how Korean traditional martial arts cultivate self-discipline and ethical behaviour; Patel and Singh (2022) show that Indian kushti wrestling strengthens social bonds and mutual respect; Hossain (2024) highlights the emotional benefits of movement rooted in local heritage; and Miller and Lounsbery (2021) argue for bringing indigenous games into school curricula. The present work builds on this international body of scholarship by offering concrete evidence from eastern Indonesia. It demonstrates that Sagi boxing, for all its local character, operates

on the same universal principles: holistic development, physical literacy, moral education, and the strengthening of community ties.

Integration into the Education System

Despite its clear educational value, Sagi boxing remains absent from school physical education programmes. Students typically arrive at ritual events with little or no prior instruction, and no school currently offers systematic training in its techniques or underlying values. This gap highlights a broader disconnect between local cultural practices and the national curriculum (Arias-Estero et al., 2020). Bringing indigenous activities into formal schooling has repeatedly been shown to boost student motivation and make lessons feel more relevant (Ahmad & Wilkins, 2024).

The present study, therefore, proposes Sagi boxing as a practical, culture-based alternative for physical education, especially in regions where traditional identity remains strong (Gustian, 2020, 2021). Practically, it recommends sustained partnerships between schools and customary communities to develop ongoing programmes that teach both the movements and the values of Sagi. These could take shape as after-school clubs or dedicated "cultural sport studios" run jointly by teachers and village elders (Hananingsih et al., 2024). Initiatives of this kind align closely with UNESCO's (2023) call for culturally responsive education, creating valuable spaces for intergenerational exchange while promoting regular physical activity and preserving living heritage.

Challenges, Limitations, and Future Directions

The findings are encouraging, yet several limitations must be acknowledged. With only 26 participants drawn from a single sub-district, the sample is too small and too localized to support broad generalizations. My own familiarity with So'a culture, while it opens doors and builds trust, inevitably shapes my interpretation and raises the possibility of bias. Additionally, because participation in Sagi remains completely unstructured and tied to the ritual calendar, the study was unable to track long-term physiological or psychological changes over time. Future work should address these gaps through longitudinal mixed-methods designs that combine repeated biometric measurements with ongoing qualitative reflection. Comparative studies across different traditional sports in Indonesia or Southeast Asia would also deepen our understanding of how embodied cultural practices influence health and identity. Such efforts promise to situate local findings within a broader regional and theoretical context. Ultimately, this study reveals that Sagi boxing is more than just a seasonal ritual. It functions as a living educational system that weaves together physical training, moral formation, and cultural identity. By combining objective fitness data with the lived experiences of participants, the research offers a culturally grounded framework for reevaluating the role of traditional movement practices in contemporary physical education and community well-being.

CONCLUSION

This study has explored Sagi boxing through the eyes of those who live it, revealing a traditional practice that seamlessly blends demanding physical movement with moral teaching and communal belonging. Young participants and elders alike described how regular involvement builds not only endurance and coordination but also emotional steadiness, courage, and a more profound sense of connection to their village and heritage. Rather than simply measuring fitness scores, the research demonstrates that Sagi provides a living example of how embodied cultural practice can nurture both body and character simultaneously. The broader implication is straightforward: indigenous movement traditions, such as Sagi, deserve serious consideration as viable, contextually rich alternatives (or complements) to conventional physical education and public health programs. The evidence presented here is suggestive rather than definitive. However, it clearly points toward real benefits in physical capability, self-discipline, and social cohesion, benefits that emerge naturally from participation rather than from imposed training regimes. In an era when many Indonesian youth face sedentary lifestyles and a growing disconnect from local heritage, practices such as Sagi remind us that health

and identity need not be pursued separately. Future studies should build on these insights with larger samples, longitudinal designs, and more detailed physiological and psychological measures, as well as comparative work across other regional traditions. Until then, Sagi boxing stands as a quiet but powerful illustration of how movement rooted in culture can contribute to the physical, emotional, and social vitality of a community.

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