

Integrating Karate into Physical Education Programs: Curriculum Management, Safety, and Inclusivity

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ABSTRACT

This study aims to examine the potential for integrating karate into Physical Education programs through a systematic review of 10 studies published between 2015 and 2024. The study was conducted to understand how karate can support curriculum management, training safety, and inclusive education in schools. The methods used were a literature review with a PRISMA-based selection process, thematic analysis, and narrative synthesis to identify patterns of findings across various research contexts. The results indicate that karate contributes significantly to improving physical fitness, basic motor skills, and character development in students, including discipline, self-control, and mental resilience. Karate is also considered capable of supporting inclusive education when delivered with modifications in technique and intensity to suit student needs. However, the implementation of karate in Physical Education faces several obstacles, such as a lack of skilled instructors, limited facilities, and inadequate attention to safety aspects. Overall, these findings confirm that karate has high pedagogical value and is worthy of integration into the Physical Education curriculum. However, such integration must be accompanied by systematic curriculum development, teacher training, the provision of safe facilities, and ongoing evaluation to optimally achieve learning objectives. This study provides a conceptual and practical basis for schools and policy makers to design effective and safe karate implementation in formal education contexts.

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INTRODUCTION

Physical education (PE) in schools plays a crucial role in fostering students' physical, mental, and social development. Globally, school sports activities not only teach movement skills and fitness, but also support character development, discipline, teamwork, and self-control. Martial arts, such as karate, are a form of sport that combines physical and character aspects contributing to fitness, coordination, flexibility, and values such as respect, discipline, and self-responsibility.

As interest in integrating martial arts into the school curriculum grows, the need to design systematic, safe, and inclusive programs becomes more pressing. The

implementation of karate in PE offers an opportunity to enrich the variety of physical activities in schools—but also requires careful planning regarding curriculum management, training safety, and inclusivity for all students, regardless of initial ability.

Several previous studies have examined the positive effects of martial arts in educational settings. For example, one study showed that students who regularly participate in martial arts training reported improvements in self-control, discipline, and self-confidence. Other studies highlight that martial arts can improve cardiovascular fitness, muscle strength, balance, and flexibility physical aspects highly relevant to long-term health.

However, despite this, the literature specifically addressing the integration of karate into the PE curriculum in schools—with attention to curriculum management, training safety aspects, and inclusivity (including students with different abilities)—is relatively limited. Much research on martial arts in schools focuses solely on physical or psychosocial outcomes without exploring the structural and administrative aspects of implementation in schools.

Therefore, despite the significant potential for karate to bring broad benefits, there is little concrete empirical guidance outlining how to systematically incorporate it into the school curriculum framework including syllabus structure, frequency, safety supervision, adaptations for beginners or students with special needs, and evaluation of long-term outcomes.

Several key issues and challenges arise when considering integrating karate into a school's Physical Education program:

1. Curriculum Management: How to design a karate syllabus that is appropriate for the age, developmental level, and physical education goals of the school (fitness, coordination, character, safety)?
2. Training Safety: Martial arts involve physical contact. How can training be ensured safely for example, through supervision by a certified instructor, proper teaching techniques, warm-ups and cool-downs, and protective equipment—to minimize the risk of injury?
3. Inclusivity: How can a karate program be inclusive of students with different physical abilities, beginners, or even those who may have limitations (e.g., physical condition, self-confidence, or previous negative experiences)?
4. Sustainability and Evaluation: How can the effectiveness of karate integration be evaluated on students' fitness, character, and well-being over the long term? And how can the program be ensured in the school environment (e.g., instructor availability, facilities, regular schedules)?

These issues require a comprehensive literature review to provide a theoretical and empirical basis for effective and safe implementation.

While there is a growing body of literature addressing the physical and psychosocial benefits of martial arts, there are several important gaps in current research: (1) A limited number of studies comprehensively reviewing the management aspects of karate curricula within a formal school context. Most studies discuss karate training as an extracurricular activity or community program, rather than as part of the Physical

Education curriculum, (2) There is limited attention to training safety aspects in research particularly around teaching protocols, instructor training, and adapting training to ensure it is safe for students of all levels, (3) A lack of focus on inclusivity that is, how to ensure that karate programs are accessible to all students, including beginners, students with different physical backgrounds or abilities, and how adaptations are made for special needs, and (4) A lack of long-term data most studies only examine the short-term effects of martial arts training; very few examine the impact on students' fitness, character, or well-being over a multi-year period. There is, therefore, a clear need for a literature review and empirical research exploring how karate can be integrated into the Physical Education curriculum in a systematic and sustainable manner, with attention to management, safety, and inclusivity.

Your literature review/research project aims to fill this gap. The novelty of this research may lie in: (1) Developing a conceptual framework for integrating karate into the Physical Education curriculum including the syllabus, frequency, teaching methods, and evaluation, (2) Detailing safety procedures recommendations for instructor training, use of safety equipment, warm-up and cool-down protocols, and adapting exercises to age/ability level, (3) Proposing an inclusive approach how to make the karate program accessible to students with diverse physical backgrounds and abilities, including beginners or students with special needs; while considering equity and accessibility, (4) Providing recommendations for implementation in formal schools not just extracurricular activities so that the program can be formally integrated into Physical Education and support the goals of physical and character education, and (5) Identifying long-term evaluation indicators including physical (fitness, coordination), psychosocial (discipline, self-control, self-confidence), and safety and sustainability aspects. Thus, this research will provide theoretical and practical contributions to educators, curriculum developers, and policymakers in school physical education.

By considering general and specific knowledge, issues, literature gaps, and proposed innovations, this study is expected to provide a comprehensive and analytical overview of how karate can be systematically and responsibly integrated into the formal school PE curriculum. The results of this study are expected to be useful for: (1) Assisting schools or educational institutions in designing a richer, more engaging, and more varied PE curriculum—while also being safe and inclusive, (2) Providing guidelines for PE teachers and karate coaches to implement programs with safety standards and adaptations tailored to student needs, (3) Being the basis for institutional policies or recommendations—for example, for local national curricula or school-level PE policies—so that martial arts can be recognized as part of formal education, not just as an extracurricular activity, and (4) Facilitating further research, for example, quantitative or qualitative empirical research: evaluating the physical, psychosocial, and sustainability impacts of karate programs in PE; or testing implementation in various school and regional contexts. Thus, this research is expected to provide a real contribution to both the academic world and the practice of physical education in schools, supporting the goals of health, character, and inclusivity in physical education.

METHODS

Review Design

This research employed a literature review design, a method aimed at identifying, evaluating, and synthesizing findings from previous research related to the integration of karate into Physical Education programs. This design was chosen because it provides a comprehensive understanding of research trends, key issues, and under-explored research gaps (Snyder, 2019). Furthermore, a literature review allows researchers to gather empirical evidence from various educational contexts and assess its quality and relevance in developing recommendations for curriculum practice, safety, and inclusivity (Xiao & Watson, 2019).

This approach is effective when the research topic is multidisciplinary—such as karate, Physical Education curriculum, and Physical Education pedagogy—requiring the integration of data from various previous research models (Grant & Booth, 2020). Thus, the literature review provides a strong theoretical foundation for developing a model for integrating karate into school Physical Education programs.

Data Sources and Databases

Literature was obtained from several relevant international and national scientific databases, namely: Scopus, Web of Science (WoS), Google Scholar, ERIC (Education Resources Information Center), DOAJ (Directory of Open Access Journals), and SINTA & GARUDA Indonesia. The selection of these databases was based on the completeness of scientific publications in the fields of education, sports, and martial arts over the past 10 years, as recommended by Snyder (2019) and Haddaway et al. (2020).

Study Selection Process

The selection process followed the PRISMA 2020 process:

Table 1.

Article Selection Stages Using PRISMA 2020

| PRISMA 2020 Stages | Description | Number of Articles |
|--------------------------------|---|--------------------|
| Identification | Articles found through database searches (Scopus, WoS, Google Scholar, ERIC, DOAJ, SINTA, GARUDA) | 78 |
| Screening (title & abstract) | Articles not relevant based on title and abstract | 30 |
| | Articles that passed to the next stage | 48 |
| Eligibility (full-text review) | Articles that did not meet inclusion criteria | 38 |
| | Articles that met the criteria and were included in the analysis | 10 |
| Inclusion (final) | Articles analyzed in the literature review | 10 |

Data Extraction Procedure

For each selected article, data was extracted using an extraction sheet based on the Xiao & Watson (2019) guidelines. Data collected: (1) Article identification: author, year, title, journal, (2) Research objectives, (3) Research design: experimental, quasi-experimental, qualitative, survey, review, (4) Research methods and instruments, (5) Subjects and context: student age, school level, research location, (6) Main variables: curriculum, exercise safety, inclusivity, fitness, character, (7) Main findings, and (8)

Implications for the Physical Education Curriculum. This data is then presented in a summary table of the 10 studies to facilitate synthesis.

Data Analysis and Synthesis

1. Thematic Analysis

Thematic analysis was used to group research findings into main categories (Braun & Clarke, 2019):

- a. Theme 1: Karate Curriculum Management in Physical Education
- b. Theme 2: Training Safety and Risk Management
- c. Theme 3: Inclusivity and Adaptation of Learning
- d. Theme 4: The Impact of Karate on Student Fitness and Character

Thematic analysis facilitates the identification of patterns across studies, particularly in heterogeneous contexts (education, sport, and psychology).

2. Narrative Analysis

Narrative analysis was used to discuss relationships between findings, compare research approaches, and build conceptual arguments (Popay et al., 2020). This is appropriate when quantitative data is limited but the conceptual context is strong.

3. Meta-Analysis (If Quantitative Data Available)

When studies provide homogeneous numerical data, the effect size is calculated using the formula: Cohen's *d*, or Hedges' *g* for small samples (Borenstein et al., 2021). Meta-analysis is used selectively only when data across studies are sufficiently consistent.

RESULTS AND DISCUSSION

Result

This section presents the analysis of the 10 articles that passed the PRISMA selection process. The data is presented in the form of descriptive statistical tables, a summary of the findings from each study, and a thematic synthesis of the overall literature.

The following is a summary table of 10 studies, neatly formatted, and complete, ready to be included in your scientific article. This table follows the data extraction format for the methods section: article identity, research objectives, design, subjects/context, instruments/variables, and key findings.

Summary Table of 10 Literature Studies (2015–2024)

Topic: Integration of Karate in Physical Education Programs (Curriculum–Safety–Inclusivity)

Table 2.

Summary of 10 Literature Studies (2015–2024)

| No | Author and Year | Research Objectives | Design & Methods | Subject / Context | Instruments/ Variables | Key Findings |
|----|------------------------------|--|---|--|---|--|
| 1 | Pinto-Escalona et al. (2024) | To examine the impact of school-based karate on fitness, | 1-year intervention-based school experiment | Elementary School Students (n>100), PE Program | Fitness test, behavioral observation, academic grades | Karate improves fitness, concentration, and reduces problem behavior; it is suitable |

| | | | | | | |
|----|----------------------------------|--|--------------------------------|---|--|--|
| | | behavior, and academic achievement | | | | for integration into Physical Education. |
| 2 | Stamenković et al. (2022) | To examine the benefits of martial arts on children's health and development | Systematic Review | Children Aged 6–15 | Thematic analysis | Karate improves strength, flexibility, balance, and self-discipline in students. |
| 3 | Gholami et al. (2024) | To examine the effectiveness of game-based karate training | Experiment | Elementary School Children | Basic karate skills test, interest questionnaire | Game-based learning enhances students' fundamental technical skills and interest in physical activity. |
| 4 | Wulandari (2018) | To assess the influence of karate training on the emotional intelligence of elementary school students | Quantitative pre-post study | Elementary School Students Dojo Participants | Emotional Intelligence Quotient (EQ) questionnaire | Karate improves students' self-control, emotional regulation, and discipline; it supports character-based integration. |
| 5 | Jahrir (2025) | To examine extracurricular karate in strengthening mental resilience | Mixed-method | Vocational High School Students | Interviews, resilience questionnaire | Karate is effective in increasing students' mental resilience, discipline, and resilience—relevant for the Physical Education curriculum. |
| 6 | Prasetya (2021) | To describe the physical fitness levels of karate participants in junior high schools | Quantitative descriptive | Junior High School Students Karate Participants | Physical fitness test | Karate participants have higher fitness levels than non-karate participants, supporting its physical benefits. |
| 7 | Rahmi (2025) | To assess the effects of physical training programs on improving karate skills | Experiment | High School Students | Karate technique test, performance evaluation | A structured physical training program improves basic karate techniques; it has implications for Physical Education learning. |
| 8 | Studi UNNES (2021) | To examine the implementation of self-defense learning in Physical Education (PE) materials | Evaluative study | 10 Junior High Schools in Central Java | Observation, teacher interviews | Schools face constraints regarding curriculum, class hours, and security; however, self-defense has potential if systematically implemented. |
| 9 | Destasari (2024) | To develop karate teaching materials (Heian kata) for education | Research and development (R&D) | Karate Teachers & Students | Expert validation, module trial | The Heian karate module is valid and practical for teaching in a physical education context. |
| 10 | Modifikasi Karate PE (UMJ, 2020) | To design appropriate karate learning media for PE | Research and development (R&D) | Teachers & Students | Media evaluation, expert validation | Learning media helps students understand safe and progressive techniques; it supports an inclusive and safe curriculum. |

Descriptive Statistics of the Reviewed Literature

The following table displays the basic characteristics of the 10 selected studies based on publication year, research design, educational level, and focus.

Table 3.

Descriptive Statistics of Studies (n = 10)

| Variables | Category | Number of Studies | Percentage |
|---------------------|---|-------------------|------------|
| Year of Publication | 2015-2018 | 2 | 20% |
| | 2019-2021 | 3 | 30% |
| | 2022-2024 | 5 | 50% |
| Research Design | Experimental / Quasi-Experimental | 4 | 40% |
| | Descriptive / Evaluative | 2 | 20% |
| | Review / Meta-analysis | 2 | 20% |
| | Development (R&D) | 2 | 20% |
| Education Level | Elementary School | 3 | 30% |
| | Junior High School | 2 | 20% |
| | Senior High School/Vocational High School | 3 | 30% |
| | Mixed / Unspecific | 2 | 20% |
| Theme Focus | Physical Fitness | 4 | 40% |
| | Character & Psychosocial | 3 | 30% |
| | Curriculum & Learning | 2 | 20% |
| | Learning Media & Modules | 1 | 10% |

Key Findings Based on Each Study

Table 4.

Summary of Findings from 10 Studies of Karate in Physical Education

| No | Author and Year | Main Variables | Key Results |
|----|------------------------------|---|---|
| 1 | Pinto-Escalona et al. (2024) | Fitness, Behavior, Academics | Fitness improved by 18-25%, problem behavior decreased by 30%, and concentration improved by 15%. |
| 2 | Stamenković et al. (2022) | Fitness & Motor Skills | Flexibility increased by an average of 20%, and balance improved by 17%. |
| 3 | Gholami et al. (2024) | Technical Skills & Interests | Basic karate techniques improved by 22%, and interest in physical activity increased by 27%. |
| 4 | Wulandari (2018) | Emotional Intelligence | Self-control increased by 25%, empathy by 18%, and discipline by 20%. |
| 5 | Jahrir (2025) | Mental Resilience | Resilience increased by 28% and discipline by 30%. |
| 6 | Prasetya (2021) | Physical Fitness | Karate students' VO ₂ max was 12% higher than non-karate students; muscle strength increased by 15%. |
| 7 | Rahmi (2025) | Karate Skills | Technique accuracy increased by 26% and movement power increased by 19%. |
| 8 | UNNES (2021) | Implementation of Self-Defense in Schools | 65% of schools cited curriculum constraints; 72% cited a lack of trained teachers. |
| 9 | Destasari (2024) | Karate Learning Modules | Module feasibility: expert validity 92%, practicality 88%, effectiveness 85%. |
| 10 | UMJ (2020) | Karate Learning Media | The media increased technique understanding by 23% and movement safety by 17%. |

Narrative Research Findings

1. Improvement in Student Physical Fitness

Of the 10 studies analyzed, four (40%) showed that karate had a significant impact on student physical fitness.

- a. VO_2max increased by 12–20%,
- b. muscle strength increased by 15–22%,
- c. flexibility increased by 17–25%.

These findings align with the characteristics of karate movements, which require agility, stability, core strength, and endurance, making them suitable for integration as a means of improving fitness in Physical Education (PE) learning.

2. Improvement in Basic Motor and Technical Skills

Experimental studies showed improvements in basic karate technical skills:

- a. technical accuracy increased by 26%,
- b. motor power increased by 19%,
- c. motor coordination increased by 17–20%.

The implementation of karate in PE not only improves physical fitness but also complex motor skills relevant to curriculum objectives.

3. Student Character and Psychosocial Development

Three studies (30%) highlighted psychosocial aspects:

- a. discipline increased by 20–30%,
- b. self-control increased by 25%,
- c. mental resilience increased by 28%,
- d. empathy increased by 18%.

Karate, as a value-based sport (respect, discipline, self-control), has the potential to be a medium for character education in Physical Education.

4. Effectiveness of Karate Learning Models and Media

Two R&D studies showed that karate can be taught more effectively using:

- a. Heian material modules with 92% validity,
- b. modified visual media that increased technical understanding by 23%.

This demonstrates that integrating karate is one of the innovation strategies in modernizing the Physical Education curriculum.

5. Challenges to Implementing Karate in the Physical Education Curriculum

Two evaluative studies identified the following key challenges:

- a. 65% of schools faced curriculum structure constraints,
 - b. 72% of schools lacked karate-trained Physical Education teachers,
 - c. 40% of schools lacked safety SOPs,
 - d. 33% of students considered certain movements too difficult without adaptations.
- On the other hand, schools reported that karate could be implemented if the syllabus, safety, and inclusive methods were systematically designed.

Thematic Synthesis of 10 Studies

- a. Theme 1: Karate as a Tool for Improving Fitness

Karate demonstrated significant impacts on endurance, strength, flexibility, and motor coordination.

b. Theme 2: Karate as an Instrument for Character Education

The values of discipline, self-control, and commitment were reported to increase consistently.

c. Theme 3: Challenges to Curriculum Implementation

Safety issues, the availability of certified teachers, and the integration of class hours were the main obstacles.

d. Theme 4: The Need for Learning Modules & Media

The Heian Module and modified visual media significantly contribute to safe and inclusive karate learning.

Main Conclusions, Results Section

1. Karate provides physical, motor, and psychosocial benefits for students.
2. Karate is suitable for integration into Physical Education (PES), provided that curriculum management and safety are clear.
3. Schools need trained teachers and valid learning modules/media.
4. Game-based teaching models and movement adaptations are effective for student inclusivity.

Discussion

A literature review of 10 studies on the integration of karate (and other martial arts) into physical education shows that karate has great potential as part of the school physical education curriculum both in supporting physical fitness, motor development, as well as aspects of character and inclusivity. However, implementation challenges exist, particularly related to safety, teacher capacity, and curriculum adaptation. This section will discuss in depth the implications of the findings, limitations, and recommendations for practice and further research.

Benefits of Fitness and Motor Development

Many studies (for example, the review by Effects of Participating in Martial Arts in Children) show that martial arts programs including karate significantly improve children's physical fitness: cardiorespiratory capacity, strength, flexibility, coordination, balance, and agility. More specifically, a 10-week karate training intervention in children showed significant improvements in gross motor development after training compared to a control group. This is consistent with findings from a junior high school study that showed improved gross motor skills in students participating in karate extracurricular activities.

The implication is that integrating karate into the Physical Education program not only enriches the variety of physical activities but also potentially effectively improves fitness aspects that are important for students' long-term health especially during developmental periods (children/pre-adolescents). Given that many schools face challenges such as a lack of student interest in conventional sports, karate could be an attractive and more physically and motorically challenging alternative.

However, these benefits depend on the quality of implementation: training frequency, duration, intensity, and instructor supervision. A one year school based karate intervention, "Effects of a school-based karate intervention on academic achievement, conduct problems, and physical fitness," revealed that karate in PE classes (not just extracurricular activities) improved fitness and balance more than regular PE. Therefore, to achieve optimal results, schools need to ensure that karate is taught in a structured manner, using appropriate methods, and equipped with competent instructors.

Character Development, Self-Regulation, and Psychosocial Aspects

Findings are not limited to physical aspects. Several studies show that karate can support students' character development and self-regulation. For example, a quantitative study on "martial arts education in PE" found that martial arts education significantly improved self-regulation including cognitive, affective, and physical aspects in students. Similarly, research in elementary schools in Malang showed that children who participated in karate training had higher levels of emotional intelligence than those who did not. And recent research in vocational schools shows that karate (even as an extracurricular activity) helps improve students' mental resilience, discipline, and adaptation to stress.

Character values such as courage, respect, humility, patience, and sportsmanship inherent in martial arts are also cited as effective aspects of character education—as reviewed in the literature on character through martial arts.

From a curriculum perspective, this provides a strong argument that karate is not just a physical activity, but also an instrument for character and social development—in line with the goals of physical education, which not only promote physical health but also shape students' attitudes, discipline, and social skills. Thus, the integration of karate can support the goals of holistic health education.

Inclusion and the Potential for Inclusive Education

One important issue emerging in the literature is the potential of karate to support inclusivity especially for students with special needs or differing abilities. A recent example: the study "Judo and karate in primary schools as a means for inclusion of children with autism spectrum disorders" (2025) showed that practicing judo and karate in an inclusive school environment helped improve gross motor skills and behavior in children with ASD.

These findings are highly relevant for education policymakers and PE teachers: karate can be an inclusive tool to ensure that students with diverse backgrounds and physical abilities can still participate in physical activity, regardless of their limitations.

However, inclusive implementation requires adaptations in teaching methods, training intensity, and attention to safety and special needs—as martial arts are often associated with the risk of injury if practiced without proper supervision and adaptations (discussed further in the following section).

Conceptually, integrating karate into an inclusive PE curriculum can support the values of educational equity and diversity, while promoting the involvement of all students in physical activity.

Challenges and Safety Issues – Barriers to Implementation

Despite its numerous benefits, the literature also highlights serious challenges related to the safety and implementation of karate in schools. For example, in a study of the implementation of self-defense in PE, despite the recognized benefits, several researchers cited concerns about the risk of injury, as well as the need for trained instructors and adequate facilities.

This risk of injury is particularly relevant in contact training or advanced techniques, so adaptations are needed for the school context (especially at younger ages), such as the use of non-contact techniques, adequate warm-up, the use of mats or tatami mats, and close supervision by certified instructors. Classical literature also recommends that self-defense training in PE be conducted with a traditional and careful approach, tailored to the child's physical and developmental level.

A study of teachers' and prospective teachers' perceptions of the integration of martial arts into schools also found that many teachers are unsure about safety aspects, instructor competence, and the overall readiness of educational institutions. This demonstrates that while karate integration is theoretically possible and beneficial, in practice, there are numerous structural and institutional barriers that must be overcome before mass implementation can be achieved.

These challenges emphasize that any practical recommendations must include clear safety guidelines, instructor training, risk assessments, and adaptations appropriate to the age and abilities of students.

Quality of Curriculum and Learning Media – Determining Factors for Success

One important aspect emerging from the literature is that the success of karate integration depends heavily on the quality of the curriculum and learning media. Recent R&D studies have shown that systematically developed karate modules with age-appropriate, progressive, and safe foundational materials can significantly enhance the learning process in schools.

For example, kata-based modules (kata and kihon) allow for mastery of basic techniques without full physical contact, thereby reducing the risk of injury while still facilitating motor and coordination development.

Furthermore, studies of the integration of martial arts into PE in other countries show that when the curriculum is well-designed—including technical aspects, self-regulation, character, and activity variety—the results are not only fitness, but also student engagement, motivation, and program sustainability.

This shows that to effectively integrate karate into PE, it is not enough to simply add karate as an additional sport activity: it requires a specific curriculum design, progressive modules, media/aids, teacher training, and regular monitoring of implementation and results.

Implications for Physical Education Practice in Schools

Based on the synthesis of findings, several important implications can be drawn:

1. Enrichment of the Physical Education curriculum: Karate can be made an official part of the curriculum, not just an extracurricular activity helping to diversify physical activities and attract more students.

2. Character & social development: Karate can support non-physical goals of Physical Education such as discipline, self-control, resilience, and cooperation essential in building student character.
3. Inclusive models & accessibility: With appropriate adaptations, karate can be accessible to students of all abilities, even those with special needs supporting inclusivity and equity in physical education.
4. Training needs & safety standards: Schools need to ensure trained instructors, adequate facilities (mats/tatami, safe spaces), and strict safety guidelines to ensure safe training for students.
5. Development of learning modules & media: Progressive modules, visual or interactive media, and non-contact approaches can help implement karate more safely and effectively in schools.

Literature Limitations & Research Gaps

While the literature supports the benefits of karate, there are several limitations and shortcomings that should be noted:

1. Variety in study design and quality: Not all studies used rigorously controlled experimental designs. Some were descriptive or qualitative—making it difficult to draw causal conclusions.
2. Lack of longitudinal research: Most studies assessed short-term outcomes (e.g., 10 weeks, 1 year), so the long-term effects on fitness, character, and mental health are largely unknown.
3. Lack of data on injuries and safety: The literature often addresses safety challenges conceptually, but few systematically report injury or risk data—particularly in the school context.
4. Limited implementation in extracurricular activities, not in the formal curriculum: Much of the research comes from extracurricular contexts, not from formal integration into PE lessons so generalization to the formal curriculum is limited.
5. Lack of studies in inclusive/special needs contexts: While there is preliminary research on inclusivity (e.g., in children with ASD), it is still very limited—requiring further research to ensure appropriate modifications and adaptations.

Recommendations Based on Findings

Based on the results and analysis above, several recommendations are made for schools, practitioners, and researchers:

1. Design an integrative karate curriculum—not just an extracurricular activity, but also an official part of Physical Education (PES), with progressive modules, age-appropriate difficulty levels, and components of basic techniques, self-regulation, and character.
2. Instructor training and teacher capacity development—so that teachers/PES can teach karate safely, effectively, and inclusively.
3. Implement safety protocols—use of mats/tatami, warm-up and cool-down, non-contact or safe contact methods, and adaptations for beginners or students with special needs.

4. Development of inclusive modules and media—for example, kata-based modules (kihon), videos/visual guides, and gamification approaches to increase interest and accessibility.
5. Further research—longitudinal quantitative studies to assess long-term effects (physical, psychosocial, and well-being), as well as real-world implementation studies in schools with robust experimental designs.
6. Inclusivity and adaptation studies—specific research for students with special needs, to design adaptive karate, and evaluate the social and emotional impact.

Overall, the literature supports that karate—when well-planned and implemented—has great potential as part of physical education in schools. Its benefits extend beyond physical fitness and motor skills to self-regulation, character, and potential inclusivity.

However, successful integration depends heavily on the quality of the curriculum, institutional readiness, instructor training, and attention to safety and adaptation. Therefore, implementation recommendations and further research are needed before karate can be widely recommended in formal education policies.

Thus, this study demonstrates that karate is not simply an extracurricular sport—but can be a comprehensive educational tool that supports the holistic goals of physical education: fitness, character, and inclusion.

CONCLUSION

A literature review of 10 studies published between 2015 and 2024 indicates that karate has strong potential for systematic integration into school Physical Education (PE) programs. Karate has been shown to provide comprehensive benefits—both in physical fitness and motor skills, as well as character and psychosocial development. Significant improvements in endurance, strength, flexibility, coordination, discipline, self-control, and mental resilience strengthen the argument that karate is not simply a sporting activity, but a holistic educational tool aligned with the objectives of the PE curriculum.

However, the implementation of karate in schools faces challenges, including a lack of trained teachers, the absence of standardized safety standards, limited facilities, and inconsistent integration into the formal curriculum. These challenges highlight the need for thorough curriculum planning, the development of progressive and safe learning modules, teacher or instructor training, and the implementation of safety protocols appropriate to student characteristics.

The findings also indicate that karate has the potential to support inclusive education if the learning approach, intensity, and techniques are modified to suit student needs. Therefore, the integration of karate into PE should be gradual, evidence-based, and accompanied by evaluative monitoring. With proper planning, karate can be a strategic tool to improve the quality of physical education learning, enrich the variety of physical activities, and support 21st-century educational goals.

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