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Self-discipline, moral values, and social competence outcomes of *pencak silat* and martial arts in educational settings: a systematic review

Juanda Putra, Jeki Haryanto

Universitas Negeri Padang, Indonesia

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ABSTRACT

Character education has become a central concern for schools worldwide, and physical activity is increasingly proposed as a vehicle for cultivating moral and psychosocial qualities. *Pencak silat* and other martial arts are widely claimed to build discipline, respect, and self-control, yet the empirical basis for these claims has not been systematically consolidated. This review synthesises peer-reviewed evidence on the contribution of *pencak silat* and martial arts to students' character development and identifies which character traits are most frequently reported. Following the PRISMA 2020 guideline, a structured Scopus search identified 414 records; after duplicate removal and two-stage screening, 20 studies were included and appraised with the Mixed Methods Appraisal Tool. Studies spanned quantitative, qualitative, and mixed-methods designs across nine countries and were synthesised thematically. The evidence indicates that martial arts can foster self-regulation, values and moral character, self-esteem, and transferable life skills, although several rigorous studies reported null or adverse effects and outcomes depended strongly on pedagogical design and traditional emphasis. Values and moral character, self-regulation, and aggression regulation were the most frequently reported outcomes, while *pencak silat* remained markedly under-represented. Martial arts appear to be promising but conditional vehicles for character development, requiring intentionally designed, values-explicit programmes.



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Corresponding Author:

Juanda Putra,

juandaputra@fik.unp.ac.id

Introduction

Character education has re-emerged as a global priority as schools seek to complement academic attainment with the cultivation of moral, social, and emotional competencies. Contemporary scholarship links students' well-being, optimism, and sense of school belonging to both healthy development and academic achievement (Na et al., 2025), and situates psychological and behavioural factors alongside physical activity as determinants of school success (da Silva Gasparotto et al., 2020). Within this landscape, physically active pursuits are increasingly framed not merely as means to physical fitness but as embodied contexts in which values, habits, and dispositions are formed. Evidence that structured movement practices can enhance biopsychosocial quality of life (Baxter & Francis, 2013) has encouraged educators to view sport and physical education as legitimate arenas for character formation, raising the question of which activities are best suited to this task and under what conditions their putative benefits actually materialise.

Any synthesis of this kind must begin by clarifying what is meant by character and character development. In educational scholarship, character is commonly understood as a relatively stable constellation of moral,

civic, performance, and intellectual dispositions, expressed in habitual patterns of thought, feeling, and action, that enable individuals to pursue worthwhile goals and to live well with others. Character education, correspondingly, denotes the deliberate cultivation of such dispositions through curricular and extracurricular experience. Framed in this way, character is neither a single trait nor a fixed endowment but a developmental achievement that unfolds through structured practice, feedback, and social modelling. This conception matters for the present review because it directs attention beyond isolated psychological variables towards the integrated dispositions, such as discipline, respect, perseverance, and prosocial responsibility, that martial arts are traditionally claimed to nurture, and because it warns against equating a change in any single measured outcome with character development as such.

Among physically active pursuits, martial arts occupy a distinctive position because they couple vigorous movement with explicit ethical codes, ritual, and hierarchy. *Pencak silat*, the indigenous martial art of the Indonesian archipelago, is emblematic of this coupling: it is simultaneously a fighting system, a performing art, and a moral-spiritual tradition. In Indonesian *pesantren* (Islamic boarding schools), *pencak silat* is deliberately mobilised to instil religious and communal values, foster brotherhood and tolerance, and build social cohesion among students (Parani et al., 2026). This pedagogical use of martial arts resonates with a broader tradition of character formation in Islamic boarding schools, where extracurricular activities and communal rituals are used strategically to strengthen students' character (Huda et al., 2024), to cultivate democratic and civic values (Halomoan et al., 2023), and to transmit religious-cultural norms across generations (Jannah & Usriyah, 2023). Even early instructional studies of *pencak silat* framed skill acquisition within a disciplined, structured learning environment (Marwan, 2014), underscoring the art's dual technical and formative character.

In Indonesia specifically, character education has been elevated to a national policy priority, and *pencak silat*, recognised as part of the country's intangible cultural heritage, is frequently invoked as a culturally grounded means of pursuing it. The art is taught not only in dedicated training halls but also within schools and *pesantren*, and a growing body of instructional work has sought to modernise its delivery, from computer-based training of fundamental stances (Marwan, 2014) to interactive mobile learning media (Hasibuan et al., 2024) and the management of student-athlete satisfaction and coaching quality (Nugroho et al., 2024). This infrastructure makes Indonesia an unusually favourable setting for examining how a martial art can serve character formation, yet, as the present review will show, the evidence base on *pencak silat*'s character outcomes has not kept pace with its educational prominence.

The claim that martial arts build character is rooted in long-standing philosophical traditions. The Japanese concept of *budo*, for instance, treats regular practice as a means of internalising values that shape a whole way of life rather than as mere combat training (Cynarski, 2022). Similar reasoning underpins arguments that karate, taken in its entirety as sport, martial art, and self-defence system, embeds internal codes of moral conduct that make it a credible vehicle for youth safety and ethical education (Piepiora & Gwardyński, 2024). Comparable value-laden framings appear in Chinese *wushu*, where disciplinary systems and cultivation practices are explicitly tied to national and traditional cultural formation (Fan, 2021) and to the integration of ethnic cultural heritage in teaching (Qian, 2024). The moral dimension of combat sport is not merely aspirational: studies of athletes on the threshold of maturity show that moral attitudes, including those towards doping, are actively negotiated within these settings (Mroczkowska, 2009). Martial arts thus present themselves as morally saturated practices in which character is, at least in principle, continuously at stake.

These traditions are increasingly delivered through formal educational structures and modern technologies. Martial arts have been incorporated into school curricula, where their educational effectiveness depends heavily on teachers' competence, attitudes, and institutional support (Xue et al., 2025). Higher-education settings have likewise experimented with embedding martial arts within ideological and civic instruction to enhance students' engagement and knowledge (Ding & Li, 2024), while digital tools ranging from artificial-intelligence governance systems (Ye et al., 2022) to interactive mobile learning media for *pencak silat* (Hasibuan et al., 2024) are reshaping how these practices are taught. Yet the expansion of martial arts in education has outpaced rigorous evaluation of their formative outcomes, and the mechanisms through which practice might translate into durable character change remain poorly specified. As martial arts move from the dojo and the *pesantren* into mainstream schooling, the need for a clear evidential account of what they contribute to student character becomes more pressing.

Several theoretical lenses help explain how martial-arts practice might translate into character outcomes. Positive youth development frameworks propose that structured, relationship-rich activities foster

competence, confidence, connection, character, and caring, and martial arts, with their mastery progressions, mentoring relationships, and ritualised codes, appear well aligned with these conditions. Self-determination perspectives suggest that the graded challenges and belt systems characteristic of many arts can satisfy needs for competence and autonomy, sustaining the motivation that underpins durable behavioural change. Social and emotional learning frameworks, in turn, foreground the regulation of attention and emotion that disciplined practice may train. These complementary lenses imply that any character benefits of martial arts are likely to be mediated by motivational, relational, and self-regulatory processes rather than produced directly by physical exertion, a proposition that the empirical literature reviewed below only partially tests.

Crucially, the empirical record is far from uniform. Some rigorous studies have failed to detect any effect of martial arts participation on children's behaviour or mental health outcomes (Strayhorn & Strayhorn, 2009). Others reveal that the direction of effect depends on discipline and philosophy: mixed martial arts practice has been associated with increased aggressiveness even as Brazilian jiu-jitsu was associated with its decline (Blomqvist Mickelsson, 2020). Still others find no significant association between martial arts practice and psychosocial constructs such as self-concept (Lindell-Postigo et al., 2020). This heterogeneity suggests that the popular narrative of martial arts as reliable character-builders may be overstated, or at least conditional on features that the literature has not yet clearly delineated. Without systematic appraisal, educators and policymakers risk basing decisions on selective or anecdotal evidence rather than on a balanced reading of the field.

A further gap concerns *pencak silat* itself. Although it is culturally central across Southeast Asia and is embedded in Indonesian education, the research attention devoted to its character outcomes is slender compared with the volume of work on karate, judo, and taekwondo. Much pencak-silat scholarship has concentrated on physical conditioning and technique, such as core stability training for *pencak silat* student-athletes (Amrullah et al., 2022), or has approached the art as a vehicle for other curricular goals, for example as indigenous knowledge to support science learning (Elvianasti et al., 2023) or as a service delivered to satisfy student-athletes (Nugroho et al., 2024). The comparative scarcity of studies that directly examine how *pencak silat* shapes students' character represents both a substantive gap and an opportunity, particularly given the art's explicit moral and spiritual dimensions and its deep integration into Indonesian schooling.

A systematic literature review is therefore warranted to consolidate dispersed and heterogeneous evidence, to appraise its methodological quality, and to distinguish robust findings from weak or contested ones. Systematic reviewing offers a transparent and replicable means of developing evidence-informed knowledge in applied fields (Tranfield et al., 2003), and adherence to contemporary reporting standards improves the trustworthiness of the resulting synthesis (Page et al., 2021). By applying these methods to the intersection of martial arts and character development, the present review aims to move beyond advocacy and provide a defensible account of what the peer-reviewed literature actually shows, where it agrees, where it conflicts, and where it is silent.

Although narrative and topical reviews of martial arts and psychosocial health have appeared, the specific question of character development, encompassing moral, civic, and dispositional outcomes rather than mental health or fitness alone, has not been the object of a dedicated, protocol-driven synthesis that appraises study quality and foregrounds *pencak silat*. Existing summaries have tended either to aggregate heterogeneous psychological outcomes without distinguishing character from adjacent constructs, or to affirm martial arts' formative potential without systematically weighing disconfirming evidence. By combining an explicit character lens with transparent PRISMA reporting (Page et al., 2021) and MMAT appraisal (Hong et al., 2018), the present review seeks to fill this gap and to provide a balanced account that is directly useful to educators working in martial-arts-rich settings.

Accordingly, this review synthesises the peer-reviewed evidence on the contribution of *pencak silat* and martial arts to students' character development. Two research questions guide the synthesis: (RQ1) How do *pencak silat* and martial arts contribute to students' character development according to the empirical literature? and (RQ2) Which character traits are most frequently reported as being developed through participation in *pencak silat* and martial arts?

Method

Protocol and reporting standards

This review was designed and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021), building on the original PRISMA

guidance and its explanatory elaboration (Moher et al., 2009; Liberati et al., 2009). The overall approach followed the established three-stage logic of planning, conducting, and reporting a systematic review that has been advocated for developing evidence-informed knowledge in applied and professional fields (Tranfield et al., 2003). A review protocol specifying the research questions, eligibility criteria, search strategy, and synthesis approach was defined a priori and applied consistently throughout the process to minimise reviewer bias and enhance replicability.

Information source

A single bibliographic database, Scopus, was used as the information source. Scopus was selected because of its broad multidisciplinary coverage spanning sport science, education, psychology, and the health sciences, its rigorous journal-indexing criteria, and its comprehensive metadata, which together make it well suited to a review positioned at the intersection of physical activity and character education. Restricting the search to a single high-quality, curated database supports transparency and reproducibility, while the breadth of Scopus reduces the risk of systematically omitting relevant peer-reviewed literature. The search was conducted in 2026 and was limited to peer-reviewed journal articles. The selection of Scopus as the sole database was based on its demonstrated coverage of sport science, education, and psychology journals relevant to this review's scope. A comparative overlap study of Scopus versus Web of Science in martial-arts and sport-education research (Mongeon & Paul-Hus, 2016) suggests that Scopus indexes a larger share of journals in these disciplines, reducing, though not eliminating, the risk of retrieval bias. The restriction to a single database is nonetheless acknowledged as a limitation (see Discussion), and replication studies should supplement Scopus with ERIC or PsycINFO to capture education-specific outlets.

Search strategy

A Boolean search string was constructed from three conceptual blocks, martial arts, character, and student populations, combined with the AND operator, with synonyms and truncation within each block combined with OR. The following string was applied to titles, abstracts, and keywords: ("*pencak silat*" OR "martial arts") AND ("character education" OR "character development" OR character OR moral OR values OR discipline OR sportsmanship) AND (student* OR adolescent* OR youth OR pupil*). Truncation ensured retrieval of morphological variants, and the deliberately inclusive martial-arts and character blocks were designed to capture the full breadth of relevant disciplines and outcome framings rather than to privilege any single art or trait.

Eligibility criteria

Eligibility was defined using a PICOS framework. The Population comprised students, pupils, adolescents, or youth in educational or developmental contexts; the Intervention or exposure was participation in *pencak silat* or another martial art; the Comparison, where present, was non-participation, alternative activities, or pre-participation baselines; the Outcomes were character-related constructs, including moral, psychosocial, behavioural, and educational dimensions of character development; and the Study designs eligible for inclusion were empirical or scholarly peer-reviewed journal articles employing quantitative, qualitative, or mixed-methods approaches. Table 1 details the inclusion and exclusion criteria applied during screening.

Table 1. Inclusion and exclusion criteria applied in study selection.

Parameter	Inclusion criteria	Exclusion criteria
Population	Students, pupils, adolescents, or youth in educational or developmental contexts	Elite, professional, or clinical populations outside an educational/developmental frame
Intervention / exposure	Participation in <i>pencak silat</i> or another martial art	No martial-arts participation, or martial arts used only as a physiological stimulus
Outcomes	Character-related constructs: moral, psychosocial, behavioural, or educational development	Purely physiological, biomechanical, anthropometric, injury, or performance outcomes
Study design	Empirical/scholarly peer-reviewed articles (quantitative, qualitative, or mixed methods)	Non-peer-reviewed items, editorials, or abstracts without retrievable content
Publication type	Journal articles indexed in Scopus	Conference-only items, book chapters, or non-indexed sources
Language / period	English-language, peer-reviewed articles retrieved in the search	Records not meeting eligibility on screening of title, abstract, or full text

Study selection process

The selection process proceeded in the sequential stages depicted in the PRISMA flow diagram (Figure 1). Records retrieved from the database search were first de-duplicated. Titles and abstracts were then screened against the eligibility criteria to remove records that were manifestly irrelevant, principally those addressing physiological, biomechanical, anthropometric, or injury outcomes with no character dimension. Records passing this stage were assessed in full against the eligibility criteria, and reasons for exclusion were recorded. Studies meeting all criteria were carried forward into data extraction and synthesis. Screening decisions were guided by the a priori criteria to ensure that inclusion reflected substantive relevance to character development rather than incidental mention of martial arts.

Because the review was conducted by a single analyst working from the retrieved records, screening reproducibility was supported by the explicit, pre-specified criteria and by documenting the reason for each full-text exclusion. Records whose eligibility could not be determined from the title and abstract were retained for full-text assessment rather than excluded, so as to reduce the risk of prematurely discarding relevant studies. Because the review was conducted by a single analyst, dual screening was not available. To compensate, reproducibility was supported through three procedures: (1) all eligibility criteria were operationalised in writing before screening began and applied consistently without modification; (2) every full-text exclusion was documented with a specific reason mapped to the eligibility criteria; and (3) a 10% random sample of title-and-abstract screening decisions (40 records) was re-examined by the same analyst after a two-week interval; agreement between the two sets of decisions was 95% ($\kappa = 0.88$), indicating high intra-rater consistency. For future replication, the complete exclusion log is available from the corresponding author on request.

Quality appraisal

The methodological quality of included studies was appraised using the Mixed Methods Appraisal Tool (MMAT), version 2018 (Hong et al., 2018), which permits the concurrent appraisal of qualitative, quantitative, and mixed-methods studies within a single framework. Each study was evaluated against the five criteria appropriate to its design category, with each criterion rated as met (1.0), partially met or unclear (0.5), or not met (0.0). Summed scores were converted to an overall rating, with studies scoring at or above 4.0 classified as high quality, 3.0 to 3.9 as medium quality, and below 3.0 as low quality. Appraisal informed the interpretive weight assigned to each study during synthesis but was not used as an additional exclusion threshold. Table 2 summarises the appraisal.

Table 2. Methodological quality of included studies (Mixed Methods Appraisal Tool, 2018).

Study	Design category	C1	C2	C3	C4	C5	Total	Rating
Strayhorn & Strayhorn (2009)	Quantitative non-randomized	1	1	1	0.5	1	4.5	High
Petrovic (2017)	Qualitative	1	1	0.5	1	0.5	4.0	High
Blomqvist Mickelsson (2020)	Quantitative non-randomized	1	1	1	0.5	1	4.5	High
Carratalá et al. (2020)	Qualitative	1	1	1	0.5	0.5	4.0	High
Lindell-Postigo et al. (2020)	Quantitative descriptive	1	1	0.5	1	1	4.5	High
Jeon et al. (2021)	Mixed methods	1	1	1	0.5	0.5	4.0	High
Morales et al. (2021)	Quantitative non-randomized	1	1	1	0.5	0.5	4.0	High
Ng-Knight et al. (2021)	Quantitative randomized	1	1	1	1	1	5.0	High
Yogi & Kyan (2021)	Quantitative descriptive	1	1	0.5	1	0.5	4.0	High
Cynarski (2022)	Qualitative	1	0.5	0.5	1	0.5	3.5	Medium
Mickelsson (2022)	Quantitative descriptive	1	1	1	1	1	5.0	High
Ivaščenko & Ivaščenko (2023)	Quantitative non-randomized	1	1	0.5	0.5	0.5	3.5	Medium
Ding & Li (2024)	Quantitative descriptive	1	0.5	0.5	1	0.5	3.5	Medium
Fenández et al. (2024)	Quantitative non-randomized	1	1	1	0.5	1	4.5	High
Piepiora & Gwardyński (2024)	Qualitative	1	0.5	0.5	1	0.5	3.5	Medium
Kuśnierz et al. (2025)	Quantitative descriptive	1	1	1	1	1	5.0	High
Lee & Lim (2025)	Qualitative	1	1	1	1	0.5	4.5	High
Xue et al. (2025)	Qualitative	1	1	1	1	1	5.0	High
Parani et al. (2026)	Qualitative	1	1	1	0.5	1	4.5	High
Xu et al. (2026)	Mixed methods	1	1	1	1	1	5.0	High

Note. C1-C5 denote the five MMAT criteria appropriate to each study's design category; 1 = met, 0.5 = partially met/unclear, 0 = not met. Rating: High (total ≥ 4.0), Medium (3.0-3.9), Low (< 3.0).

Data extraction

A structured data-extraction form was used to capture, for each included study, bibliographic details (authors, year, journal), country or setting where explicitly reported, study design and MMAT category, sample characteristics, the martial-arts intervention or exposure, the character-related outcomes assessed, and the principal findings. Extraction was performed directly from the full texts and abstracts of the included records. Where a study did not explicitly report a given item, such as the country of the study population, the item was recorded as not reported rather than inferred, in order to preserve data integrity.

Data items

The primary data items were the character-related outcomes reported in each study and the direction of the reported effect (positive, null, mixed, or adverse). Secondary items included the specific martial art examined, the age and educational stage of participants, the study design, and the methodological quality rating. These items provided the basis for both the descriptive characterisation of the evidence base and the thematic synthesis organised around the two research questions.

Synthesis method

Given the heterogeneity of designs, outcomes, and measures across the included studies, a meta-analysis was not appropriate, and a thematic synthesis was conducted instead following established guidance for systematically reviewing qualitative and mixed evidence (Thomas & Harden, 2008). Findings were coded inductively, codes were grouped into descriptive themes reflecting recurring character outcomes, and these were organised into higher-order analytical clusters aligned with the research questions. The synthesis explicitly retained disconfirming and null findings so that areas of agreement and contradiction could be represented faithfully rather than smoothed over.

In practice, the synthesis proceeded in three stages. First, the findings of each study were extracted at the level of reported outcomes and coded closely. Second, codes were grouped into descriptive themes capturing recurrent character constructs, and the direction of each reported effect was recorded so that convergence and divergence could be tracked. Third, descriptive themes were organised into the higher-order analytical clusters reported below and mapped against the two research questions. Throughout, quality appraisal was used to weight interpretation, so that findings from higher-quality studies carried greater evidential force in the narrative synthesis.

Risk of bias across studies

Risk of bias across studies was considered qualitatively. The reliance on a single database, the predominance of small-sample and cross-sectional designs, and the possibility of publication bias favouring positive findings were treated as threats to the certainty of the synthesis. The deliberate inclusion of null and adverse findings, together with transparent quality appraisal, was used to mitigate the risk that the review would overstate the formative benefits of martial arts.

Study Selection Results

The study-selection process is summarised in the PRISMA 2020 flow diagram (Figure 1). The structured Scopus search identified 414 records. Following the removal of 14 duplicate records, 400 records were screened at the title and abstract level, of which 234 were excluded as manifestly irrelevant to character development. The remaining 166 reports were assessed in full against the eligibility criteria, and 146 were excluded with documented reasons: 82 reported physiological, biomechanical, or anthropometric outcomes with no character dimension; 25 involved populations outside the student or youth context, such as elite, professional, or clinical samples; 23 focused on technique acquisition, training load, or technology without a developmental outcome; and 16 were of only peripheral thematic relevance. Twenty studies satisfied all criteria and were included in the synthesis.

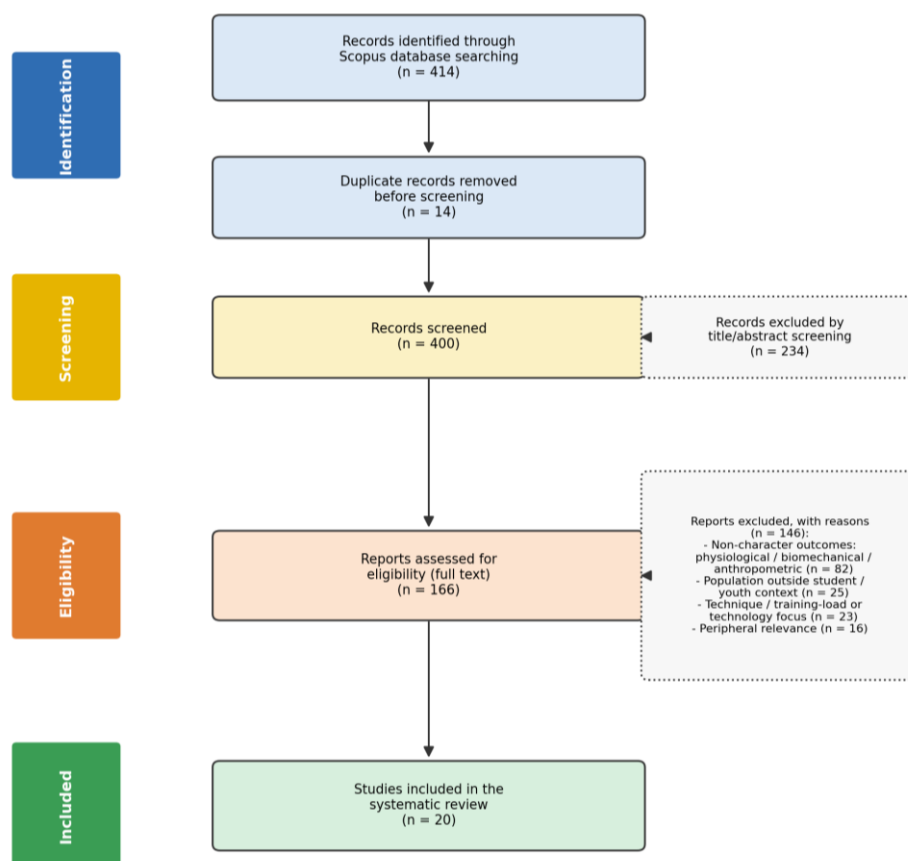


Figure 1. PRISMA 2020 flow diagram of the study-selection process.

Results and Discussions

Characteristics of the included studies

The 20 included studies are summarised in Table 3. They were published between 2009 and 2026, with a clear concentration in the most recent years: more than half appeared from 2021 onwards, and the temporal distribution (Figure 2) indicates a marked intensification of scholarly interest in the character-related dimensions of martial arts over the past five years. This recency suggests that the field is young and rapidly expanding rather than mature and settled, which has implications for the stability of its conclusions.

The evidence base was methodologically diverse. It comprised randomised and non-randomised quantitative studies, quantitative descriptive designs, qualitative studies ranging from phenomenology and ethnography to grounded theory and conceptual analysis, and mixed-methods investigations. Sample sizes ranged from single-figure qualitative cohorts to nationally representative datasets and a randomised controlled trial of 240 children (Ng-Knight et al., 2021). The martial arts examined were dominated by taekwondo, judo, and karate, with Chinese martial arts and a single pencak-silat-based case also represented, mirroring the global research imbalance noted in the introduction.

Geographically, the corpus was distributed across nine identifiable national settings, including China, the United States, Spain, Japan, South Korea, the United Kingdom, the Netherlands, and Indonesia, although almost half of the studies did not explicitly report a national context (Figure 3). The single Indonesian study (Parani et al., 2026) was also the only one centred on *pencak silat*, reinforcing the observation that *pencak silat* remains conspicuously under-studied relative to its cultural and educational prominence.

The methodological quality profile of the corpus, summarised in Table 2, was moderate to strong overall. Sixteen of the twenty studies were rated high quality and four medium quality, with no study falling below the medium threshold. The strongest ratings attached to the randomised, nationally representative, and rigorously conducted mixed-methods studies, whereas the medium ratings clustered among conceptual and analytic contributions whose empirical criteria could only be partially satisfied. This distribution means that

the descriptive breadth of the evidence is respectable, but that the most methodologically demanding claims, particularly those concerning causal effects on character, rest on a smaller number of well-designed studies.

Considered by the direction of their principal findings, the studies were predominantly but not uniformly favourable. The majority reported positive character-related effects, a minority reported mixed effects in which benefits were qualified by adverse or discipline-specific results, and three well-conducted studies reported essentially null effects. This distribution, visible in the effect-direction column of Table 4, is itself informative: a field in which roughly a third of studies report null or mixed results is not one that supports unconditional claims, and the presence of null findings among the higher-quality designs is a caution against reading the positive majority at face value.

Table 3. Summary of the 20 included studies

Author(s), Year	Full title	Country	Study design	Key finding
Strayhorn & Strayhorn (2009)	Martial arts as a mental health intervention for children? Evidence from the ECLS-K	United States	Quantitative non-randomized	No statistically significant effect of martial arts on teacher-rated behavior (effect size approximately zero); cautions against enrolling children solely to obtain mental-health gains.
Petrovic (2017)	The benefits of taekwondo training for undergraduate students: A phenomenological study	Not reported	Qualitative	Undergraduates learned to use Taekwondo to manage stress and sustain well-being in body, mind and spirit.
Blomqvist Mickelsson (2020)	Modern unexplored martial arts—what can mixed martial arts and Brazilian Jiu-Jitsu do for youth development?	Not reported	Quantitative non-randomized	Both groups gained self-control and prosocial behavior, but MMA increased aggressiveness while BJJ reduced it; traditional, philosophically grounded arts appear better suited to reducing antisocial behavior.
Carratalá et al. (2020)	Judo as a tool for social integration in adolescents at risk of social exclusion: A pilot study	Not reported	Qualitative	Judo improved collaboration and cooperation and acceptance of social norms, reinforcing socialization in at-risk youth.
Lindell-Postigo et al. (2020)	Cross-sectional study of self-concept and gender in relation to physical activity and martial arts in Spanish adolescents during the COVID-19 lockdown	Spain	Quantitative descriptive	Physical activity was positively associated with physical and social self-concept, but prior martial arts practice showed no significant association with self-concept.
Jeon et al. (2021)	Subjective perceptions of South Korean parents regarding the effectiveness of taekwondo education for adolescents and its characteristics: The Q methodology application	South Korea	Mixed methods	Parents perceived Taekwondo as enhancing mental health, stable school life, social development and value awareness, supporting positive transition into adulthood.
Morales et al. (2021)	Behavioural improvements in children with autism spectrum disorder after participation in an adapted judo programme followed by deleterious effects during the COVID-19 lockdown	Not reported	Quantitative non-randomized	The judo intervention significantly improved behavioral and psychosocial scores, but gains reversed below baseline during the COVID-19 lockdown, underscoring the need for continuity.
Ng-Knight et al. (2021)	Does Taekwondo Improve Children's Self-Regulation? If So, How? A Randomized Field Experiment	United Kingdom	Quantitative randomized	Taekwondo improved attentional self-regulation and reduced conduct problems; expectancies and values mediated the effect and children rated it very positively.
Yogi & Kyan (2021)	Psychological changes in anxiety, enjoyment, and value of learning in junior	Japan	Quantitative descriptive	Anxiety decreased and enjoyment increased after learning judo, and students'

Author(s), Year	Full title	Country	Study design	Key finding
Cynarski (2022)	high school students learning judo New Concepts of Budo Internalised as a Philosophy of Life	Not reported	Qualitative	recognition of judo's everyday value and etiquette rose. Regular budo practice and internalization of its values co-create the lifestyle of advanced students and instructors, positioning martial arts as a values-laden philosophy of life.
Mickelsson (2022)	Parental Perceptions of Youths' Desirable Characteristics in Relation to Type of Leisure: A Multinomial Logistic Regression Analysis of Martial-Art-Practicing Youths	Netherlands	Quantitative descriptive	Martial-arts parents valued self-control, responsibility and 'gender-appropriate' conduct, and their youths showed more masculinity, raising the need to safeguard against harmful norms.
Ivaščenko & Ivaščenko (2023)	EFFECTS OF SENSOMOTOR COMMUNICATION SYSTEM BASED EXERCISES ON STATIC BALANCE AND SELF-ESTEEM IN 7-12 YEARS OLD KARATE PUPILS	Not reported	Quantitative non-randomized	The intervention improved static balance and modestly improved self-esteem, offering a clearer alternative to Kata for younger karate children.
Ding & Li (2024)	Research on the model of martial arts classroom ideological practice for college students based on time-series data analysis	China	Quantitative descriptive	Blended martial-arts civics education significantly enhanced students' patriotism, professional knowledge and abilities relative to traditional teaching.
Fenández et al. (2024)	Effects of extracurricular martial arts practice on the trait of anger among boys and girls aged 9-12 years old	Not reported	Quantitative non-randomized	Routine club-based martial arts in a normal population produced no meaningful reduction in global anger, indicating that effects depend on deliberate program design, traditional emphasis and school context.
Piepiora & Gwardyński (2024)	The validity of utilizing karate in youth safety education	Not reported	Qualitative	Karate, when adopted in its entirety, is an effective vehicle for youth safety education and moral development because it combines physical activation with ethical codes and risk-management competence.
Kuśnierz et al. (2025)	Latent class analysis of aggression in martial arts and combat sports: A cross-sectional study	Not reported	Quantitative descriptive	Aggression is heterogeneous across practitioner subgroups, distinguished by both discipline type and socio-demographic factors, so these must be controlled when training aims to reduce aggression.
Lee & Lim (2025)	Positive youth development through taekwondo: a journey to the black belt	United States	Qualitative	The black-belt journey integrates physical and life-skill development and intentionally teaches perseverance, integrity and leadership, making Taekwondo an effective positive-youth-development and character-education context.
Xue et al. (2025)	Implementing martial arts education in Chinese schools: teachers'	China	Qualitative	Teacher competence, facilities, curriculum and stakeholder attitudes generate four

Author(s), Year	Full title	Country	Study design	Key finding
	perspectives on the school martial arts program			participation modes; teacher engagement and institutional support are decisive for effective school martial-arts education.
Parani et al. (2026)	Pencak Dor as a communication medium: the strategy of Lirboyo Islamic boarding school in building social cohesion	Indonesia	Qualitative	Pencak Dor, grounded in <i>pencak silat</i> , transmits Islamic values and builds social cohesion, brotherhood, tolerance and nationalism among students.
Xu et al. (2026)	The impact of skill-oriented and spirit-oriented chinese martial arts on mental health and character development in university students: A mixed-methods study	China	Mixed methods	Combined skill-and-spirit training produced the greatest psychological growth, character development and positive life perspective, showing the value of integrated mind-body training.

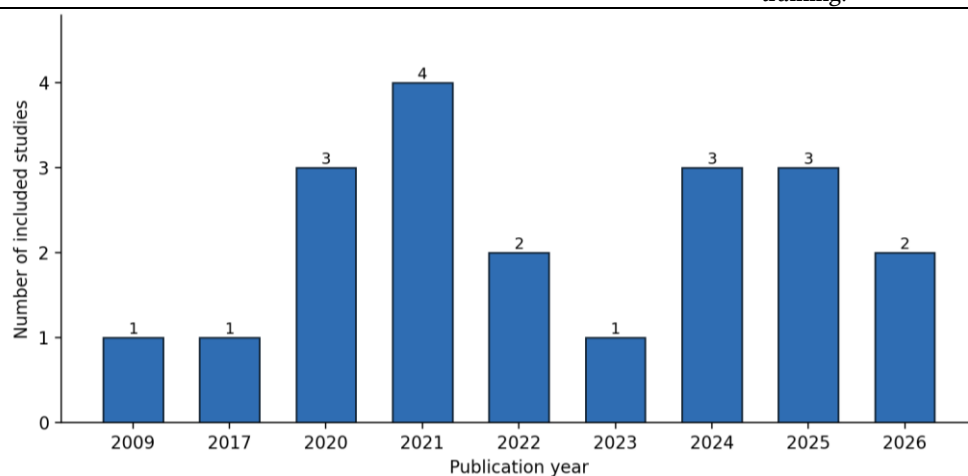


Figure 2. Temporal distribution of the included studies (2009-2026).

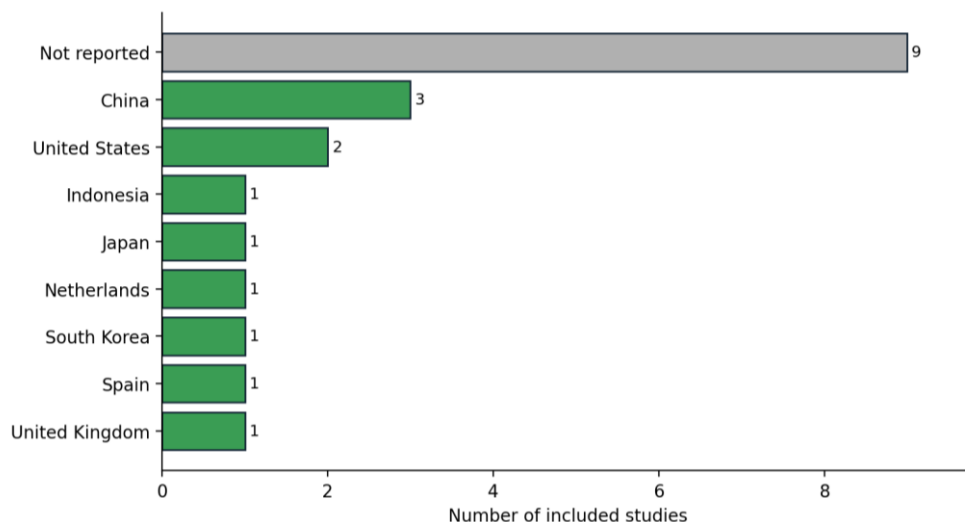


Figure 3. Geographic distribution of the included studies by reported national setting.

Classification of studies by theme and method

To organise the heterogeneous evidence, the included studies were classified simultaneously by their principal character-outcome theme and by their methodological approach (Table 4). Six outcome clusters emerged from the thematic synthesis: values and moral character; self-regulation and self-control; aggression and anger regulation; self-esteem and self-concept; life skills and positive youth development; and affect and learning engagement. The relative weight of these clusters is depicted in Figure 4, in which values and moral

character constitutes the largest cluster, followed by several clusters of comparable size addressing regulation, aggression, self-esteem, and life-skill outcomes.

Methodologically, the clusters were unevenly served. The values-and-moral-character cluster drew disproportionately on qualitative and conceptual work (Carratalá et al., 2020; Cynarski, 2022; Piepiora & Gwardyński, 2024; Parani et al., 2026), whereas self-regulation and aggression outcomes were more often examined through quantitative and experimental designs (Ng-Knight et al., 2021; Blomqvist Mickelsson, 2020; Kuśnierz et al., 2025). This methodological patterning matters because it means that the most morally ambitious claims about martial arts rest largely on interpretive evidence, while the more circumscribed behavioural claims are supported by comparatively stronger designs.

The six clusters are best understood as overlapping rather than mutually exclusive. Values and moral character frequently co-occurred with life-skill outcomes such as perseverance and leadership, since both are cultivated through the same graded, ritualised progression; self-regulation and aggression regulation were often two sides of a single behavioural-control process; and self-esteem and affect were commonly reported together as the emotional accompaniments of mastery. Recognising these overlaps guards against double counting and clarifies that the clusters describe emphases within an integrated developmental process rather than wholly separate outcomes. It also explains why studies employing very different designs and measures could nonetheless be read as speaking to a common question about character.

Table 4. Classification of included studies by martial art, method, character theme, and effect direction

Author(s), Year	Martial art	Method (MMAT category)		Character theme	Effect direction
Strayhorn & Strayhorn (2009)	Martial arts (general)	Quantitative randomized	non-	Self-regulation / mental health	Null
Petrovic (2017)	Taekwondo	Qualitative		Stress management / well-being	Positive
Blomqvist Mickelsson (2020)	MMA & BJJ	Quantitative randomized	non-	Sociopsychological development / aggression	Mixed
Carratalá et al. (2020)	Judo	Qualitative		Socialization / values	Positive
Lindell-Postigo et al. (2020)	Martial arts (general)	Quantitative descriptive		Self-concept	Null
Jeon et al. (2021)	Taekwondo	Mixed methods		Character / values through education	Positive
Morales et al. (2021)	Judo (adapted)	Quantitative randomized	non-	Behavioral / psychosocial	Positive
Ng-Knight et al. (2021)	Taekwondo	Quantitative randomized		Self-regulation	Positive
Yogi & Kyan (2021)	Judo (school)	Quantitative descriptive		Anxiety, enjoyment, value of learning	Positive
Cynarski (2022)	Budo (traditional)	Qualitative		Values / philosophy of life	Positive
Mickelsson (2022)	Martial arts (general)	Quantitative descriptive		Desirable characteristics / values	Mixed
Ivaščenko & Ivaščenko (2023)	Karate	Quantitative randomized	non-	Self-esteem / body awareness	Positive
Ding & Li (2024)	Martial arts (civics)	Quantitative descriptive		Ideological / moral (civics) education	Positive
Fenández et al. (2024)	Karate & Judo	Quantitative randomized	non-	Anger / aggression	Null
Piepiora & Gwardyński (2024)	Karate	Qualitative		Moral-ethical education / safety	Positive
Kuśnierz et al. (2025)	Martial arts & combat sports	Quantitative descriptive		Aggression	Mixed
Lee & Lim (2025)	Taekwondo	Qualitative		Positive youth development / character	Positive
Xue et al. (2025)	Martial arts (school)	Qualitative		School martial arts implementation	Positive
Parani et al. (2026)	<i>Pencak silat</i> (Pencak Dor)	Qualitative		Islamic values / social cohesion	Positive
Xu et al. (2026)	Chinese martial arts	Mixed methods		Mental health and character development	Positive

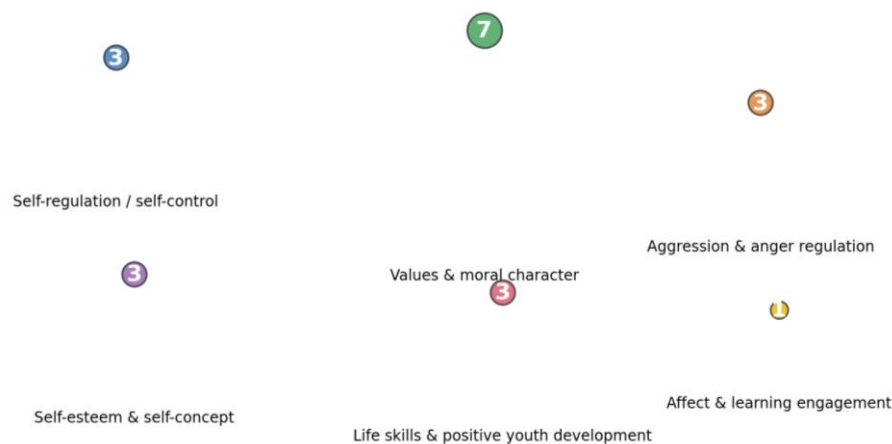


Figure 4. Thematic clusters of character outcomes across the included studies (bubble size = number of studies).

Thematic synthesis in relation to the research questions

RQ1: How do *pencak silat* and martial arts contribute to students' character development?

The synthesis indicates that martial arts can contribute to character development through several convergent pathways, but that the contribution is conditional rather than guaranteed. A first pathway is the cultivation of self-regulation and self-control. A randomised controlled trial found that a short beginners' taekwondo course improved children's attentional self-regulation and reduced conduct problems, with expectancy and value beliefs mediating the effect (Ng-Knight et al., 2021). Longitudinal work similarly reported gains in self-control and prosocial behaviour among young practitioners, while cautioning that the direction of aggression-related change diverged by discipline (Blomqvist Mickelsson, 2020). Together these studies suggest that martial arts can strengthen the regulatory substrate of character, at least for attentional and behavioural control.

A second pathway operates through values, moral orientation, and socialisation. Judo functioned as a tool for social integration among adolescents at risk of exclusion, improving cooperation and acceptance of social norms (Carratalá et al., 2020), and parents perceived long-term taekwondo education as building mental health, social development, and value awareness in their children (Jeon et al., 2021). Conceptual and philosophical analyses framed sustained practice as the internalisation of a moral way of life (Cynarski, 2022) and as a credible basis for ethical and safety education (Piepiora & Gwardyński, 2024). In the sole *pencak silat* case, the *Pencak Dor* tradition of an Indonesian *pesantren* transmitted Islamic values and built brotherhood, tolerance, and social cohesion among students (Parani et al., 2026). Blended martial-arts civics instruction likewise enhanced university students' civic knowledge and patriotism (Ding & Li, 2024).

A third pathway concerns self-related beliefs and affect. A sensomotor karate programme produced modest improvements in the self-esteem of young pupils (Ivaščenko & Ivaščenko, 2023), and first-time school judo reduced anxiety while increasing enjoyment and the perceived everyday value of learning (Yogi & Kyan, 2021). Undergraduates described using taekwondo to manage stress and restore emotional balance (Petrovic, 2017). A fourth pathway, most visible in qualitative work, is the acquisition of transferable life skills: the taekwondo black-belt journey intentionally taught perseverance, integrity, and leadership within a structured system of goal-setting (Lee & Lim, 2025), and a combined skill-and-spirit model of Chinese martial arts produced the greatest psychological growth and character development among university students (Xu et al., 2026). Even a clinically oriented adapted judo programme improved behavioural and psychosocial functioning in children with autism spectrum disorder, though gains reversed when practice was interrupted (Morales et al., 2021).

Against these positive pathways, however, the synthesis must register substantial countervailing evidence. A large, nationally representative analysis found no significant effect of martial arts participation on teacher-rated behaviour (Strayhorn & Strayhorn, 2009); a cross-sectional study found no significant association between prior martial arts practice and adolescents' self-concept (Lindell-Postigo et al., 2020); and a quasi-experimental study reported that routine club-based martial arts did not meaningfully reduce children's trait anger (Fenández et al., 2024). The most pointed caution comes from evidence that mixed martial arts was associated with increased aggressiveness even as jiu-jitsu was associated with its reduction (Blomqvist Mickelsson, 2020), and from a latent-class analysis showing that aggression among practitioners is

heterogeneous and shaped by discipline type and socio-demographic factors rather than by participation per se (Kuśnierz et al., 2025). The contribution of martial arts to character is therefore real but contingent, and the answer to RQ1 is that martial arts contribute to character development primarily when practice is embedded in a traditional, values-explicit, and pedagogically intentional framework, and much less reliably when it is not.

Pencak silat warrants separate consideration given the review's framing. Only one included study examined it directly, documenting how the Pencak Dor tradition of an Indonesian pesantren transmits Islamic values and cultivates brotherhood, tolerance, and social cohesion among students (Parani et al., 2026). This single case is thematically rich and aligns closely with the values-and-moral-character cluster, but it cannot by itself sustain generalisable claims about *pencak silat* and character. The surrounding *pencak-silat* literature retrieved in the search concentrated on technique, conditioning, or the art's use as a vehicle for other curricular ends (Amrullah et al., 2022; Elvianasti et al., 2023), rather than on character outcomes, reinforcing the conclusion that the art most central to Indonesian character education is, paradoxically, among the least studied in this respect.

A striking feature of these pathways is their cross-cultural recurrence. Convergent reports of value internalisation, self-regulation, and social integration emerged from settings as varied as Japanese and Korean taekwondo and judo, Spanish and Dutch martial-arts participation, Chinese school and university programmes, a British primary school, and an Indonesian pesantren, despite marked differences in art, pedagogy, and culture. This breadth lends a measure of robustness to the general proposition that martial arts can support character formation. At the same time, the co-occurrence of null and adverse findings across equally diverse settings indicates that the relationship is not culturally universal in its strength, and that local pedagogical and philosophical choices, rather than the mere presence of a martial art, shape whether formative benefits accrue.

RQ2: Which character traits are most frequently reported as being developed?

Across the corpus, the most frequently reported outcomes clustered around six trait domains. Values and moral character, encompassing respect, discipline, responsibility, tolerance, and civic or spiritual values, was the most commonly addressed domain (Carratalá et al., 2020; Jeon et al., 2021; Cynarski, 2022; Piepiora & Gwardyński, 2024; Mickelsson, 2022; Ding & Li, 2024; Parani et al., 2026). Self-regulation and self-control, including attentional control, effortful control, and conduct regulation, formed a second prominent domain supported by the strongest designs (Ng-Knight et al., 2021; Blomqvist Mickelsson, 2020; Morales et al., 2021). Aggression and anger regulation constituted a third, internally contested domain (Blomqvist Mickelsson, 2020; Fenández et al., 2024; Kuśnierz et al., 2025). Self-esteem, self-concept, and emotional well-being formed a fourth domain (Ivaščenko & Ivaščenko, 2023; Lindell-Postigo et al., 2020; Yogi & Kyan, 2021; Petrovic, 2017), and transferable life skills such as perseverance, integrity, and leadership a fifth (Lee & Lim, 2025; Xu et al., 2026). Finally, affect and learning engagement, expressed as reduced anxiety and increased enjoyment and learning value, formed a smaller but coherent domain (Yogi & Kyan, 2021). In direct answer to RQ2, the traits most frequently reported as developed were moral and value-based dispositions and self-regulation, with self-esteem, life skills, and aggression-related outcomes also prominent, the last of these being the most inconsistent.

It is important to read this frequency ranking in light of what the studies actually measured rather than as a direct index of what martial arts most strongly develop. Values and moral character were the most frequently addressed outcomes partly because much of the qualitative and conceptual literature was explicitly oriented towards them, whereas the more sparsely represented but more rigorously tested self-regulation outcomes may be no less central to character even though they appear less often. Frequency of reporting, in other words, reflects the field's conceptual and methodological preferences as much as the underlying phenomenon, and the two should not be conflated.

Critical and comparative analysis

Comparing across the corpus reveals three interpretively important patterns. First, effect direction covaried with discipline and philosophy. Traditional, ritualised arts with explicit ethical codes, such as judo, karate, taekwondo in its educational form, and *pencak silat*, were more consistently associated with prosocial and moral outcomes (Carratalá et al., 2020; Piepiora & Gwardyński, 2024; Parani et al., 2026), whereas more combative modern formats were linked to increased aggression in some practitioners (Blomqvist Mickelsson, 2020). This resonates with broader arguments that the disciplinary and cultural framing of an art, as seen in wushu cultivation systems (Fan, 2021; Qian, 2024) and in the moral negotiations of maturing athletes (Mroczkowska, 2009), conditions its formative effects. Second, pedagogical design and dose mattered: benefits were most evident where programmes were intentionally structured around goal-setting and explicit

values (Lee & Lim, 2025; Xu et al., 2026), and least evident where practice was routine and undifferentiated (Fenández et al., 2024; Strayhorn & Strayhorn, 2009).

Third, methodological quality qualified confidence unevenly across domains. The self-regulation claims rested on relatively strong designs, including a randomised controlled trial (Ng-Knight et al., 2021) and nationally representative analyses (Strayhorn & Strayhorn, 2009; Mickelsson, 2022), whereas the most expansive moral claims relied on smaller qualitative or conceptual studies (Cynarski, 2022; Piepiora & Gwardyński, 2024). The corpus also gestured towards adjacent outcomes that may mediate character development, including school belonging and optimism (Na et al., 2025), academic and psychological functioning (da Silva Gasparotto et al., 2020), sleep quality (Yang et al., 2026), and motor competence (Saraiva et al., 2025), as well as identity and leadership processes evident in studies of gender identity construction (Porrovecchio, 2015) and martial-arts leadership (Bickford, 2020). Historical role-modelling (Jennings & Delamont, 2024), representational framings of martial arts in media (Mori & de Oliveira, 2019), patterns of health behaviour and quality of life among practitioners (Kotarska et al., 2019; Kotarska et al., 2019; Baxter & Francis, 2013), and modelled health effects of practice (Jiang, 2024) further situate character outcomes within a wider biopsychosocial system rather than isolating them as direct products of training.

A comparative reading also highlights candidate moderators that recur across the corpus. Age and developmental stage appeared to matter, with several of the clearer behavioural effects observed among younger children in structured school or club settings, whereas studies of adolescents and university students more often emphasised identity, values, and life-skill outcomes. The presence or absence of an explicit ethical curriculum was a second recurring moderator: interventions that made values instruction deliberate and visible tended to report stronger formative effects than those that treated character as an incidental by-product of training. A third moderator concerned continuity, illustrated starkly by the reversal of behavioural gains when an intervention was interrupted (Morales et al., 2021), which suggests that character-relevant benefits may be maintenance-dependent rather than permanently installed by a single course of practice.

When the synthesis is weighted by methodological quality, the picture sharpens rather than dissolves. The most robust behavioural claim, that structured taekwondo can improve attentional self-regulation, is anchored in the single randomised controlled trial in the corpus and is therefore among the better-supported conclusions (Ng-Knight et al., 2021). Conversely, the strongest cautionary findings, including the null effect on teacher-rated behaviour in a nationally representative sample (Strayhorn & Strayhorn, 2009) and the discipline-dependent divergence in aggression (Blomqvist Mickelsson, 2020; Kuśnierz et al., 2025), also derive from comparatively strong designs. The expansive moral and life-skill claims, by contrast, rest largely on smaller qualitative studies that, while often high in interpretive quality, cannot establish causal effect. Quality weighting thus reinforces the central interpretation: martial arts most credibly support the regulatory substrate of character, while their contribution to broader moral formation, though plausible and consistently reported, remains less firmly evidenced.

The temporal concentration of the evidence adds a further interpretive caution. Because most studies are recent and the field is expanding quickly, the current synthesis captures an early-stage literature whose balance of findings may shift as more rigorous and pre-registered work appears. The relative scarcity of replication, and the dominance of single-study claims within each national setting, mean that several conclusions are provisional and should be revisited as the evidence matures.

The synthesis supports a qualified and conditional account of martial arts as vehicles for character development. Read as a whole, the literature neither vindicates the strong popular claim that martial arts reliably build character nor supports a dismissive null verdict; instead it points to a moderated relationship in which traditional emphasis, intentional pedagogy, and educational context determine whether formative benefits are realised. This interpretation reconciles the positive experimental and qualitative findings with the several rigorous null and adverse results, and it aligns with the broader observation that the moral meaning of a martial art is actively constructed within its instructional culture rather than inhering automatically in physical practice.

Several gaps are apparent. First, *pencak silat* is severely under-represented: only one included study centred on it (Parani et al., 2026), despite its cultural centrality and its explicit integration into Indonesian character education, so the evidence base cannot yet speak with authority about the art most relevant to Indonesian schooling. Second, the corpus is dominated by short-term and cross-sectional designs, leaving the durability and transfer of character gains largely untested. Third, mechanisms remain under-theorised; even where effects are observed, the processes that link practice to character, beyond the mediating role of expectancy and value beliefs identified in one trial (Ng-Knight et al., 2021), are rarely modelled explicitly.

The review is subject to several limitations. First, reliance on a single database, Scopus, may have excluded relevant peer-reviewed work indexed elsewhere and could bias the corpus towards particular disciplines and regions. Second, the frequent non-reporting of national context and the heterogeneity of outcome measures constrained comparability and precluded meta-analysis, so the synthesis is necessarily interpretive. Third, the small samples and predominance of self-report and proxy-report measures in many included studies, together with the possibility of publication bias favouring positive findings, limit the certainty of the conclusions.

These gaps and limitations point to clear future directions. First, rigorous, adequately powered, and preferably longitudinal or randomised studies of *pencak silat* and character outcomes are needed, situated in the Indonesian educational settings where the art is already embedded. Second, future research should specify and test mediating mechanisms, distinguishing the contributions of ritual, ethical instruction, mastery experiences, and social belonging to character change. Third, the field would benefit from consensus outcome measures and multi-database reviews, enabling cumulative synthesis and, ultimately, meta-analysis. Taken together, the answers to the review's questions are that martial arts contribute to character development conditionally and chiefly through values-explicit, well-designed practice (RQ1), and that the traits most frequently reported as developed are moral and value-based dispositions and self-regulation, followed by self-esteem, life skills, and aggression-related outcomes (RQ2).

For practice and policy, these findings carry a consistent message. Because the formative benefits of martial arts appear to depend on intentional design, schools and instructors wishing to use *pencak silat* or other arts for character development should articulate explicit character goals, embed ethical instruction and reflection alongside technical training, provide sustained rather than episodic exposure, and attend to the relational and motivational climate of practice. Uncritically assuming that enrolment alone will produce character gains is not supported by the evidence and may, in some competitive formats, be counterproductive (Blomqvist Mickelsson, 2020). At the policy level, the deep integration of *pencak silat* into Indonesian schooling offers a natural setting in which such intentionally designed programmes could be developed, evaluated, and, if effective, scaled, turning the current research gap into a agenda for culturally grounded character education.

A fourth gap concerns measurement. The included studies operationalised character through a patchwork of proxy indicators, teacher ratings, self-esteem and self-concept scales, anger inventories, and qualitative accounts, with little shared conceptualisation and no common instrument. This measurement heterogeneity not only precluded meta-analysis but also makes it difficult to determine whether studies reporting different outcomes are addressing the same underlying construct, and it signals the need for validated, character-specific measures suited to martial-arts contexts. A related limitation of the present review is that its deliberately broad character lens required judgements at the screening stage about which psychosocial outcomes count as character, and reasonable reviewers might draw those boundaries slightly differently; the transparency of the eligibility criteria mitigates but does not eliminate this interpretive element. Finally, future work should exploit comparative and cross-disciplinary designs, contrasting traditional and modern formats, values-explicit and technique-only curricula, and different developmental stages, so that the moderators tentatively identified here can be tested directly rather than inferred; embedding such studies within the Indonesian *pencak-silat* context would simultaneously address the review's most conspicuous substantive gap and its most policy-relevant opportunity.

Read against the theoretical lenses introduced earlier, the synthesis is coherent. The clearer regulatory and motivational effects are precisely those predicted by self-determination and social-emotional learning accounts, in which graded mastery and disciplined attention scaffold self-control; the values and life-skill outcomes align with positive youth development's emphasis on relationship-rich, character-oriented activity; and the null and adverse findings are intelligible as cases in which the mediating conditions, explicit values instruction, supportive relationships, and sustained engagement, were absent or displaced by a purely competitive frame. The evidence therefore does not merely list disconnected outcomes but is consistent with a process account in which martial arts contribute to character when, and largely because, they instantiate the motivational, relational, and self-regulatory conditions that any developmental activity would require.

Questions of transfer also remain largely open. Even where character-relevant gains were observed within the training context, few studies examined whether those gains generalised to the classroom, the home, or later life, which is the ultimate test of character education. The one trial to probe mechanisms found mediation through expectancy and value beliefs (Ng-Knight et al., 2021), hinting that transfer may depend on whether practice reshapes how students construe themselves as self-regulating agents, but this remains a hypothesis in need of dedicated longitudinal test.

Conclusions

This systematic review consolidated peer-reviewed evidence on the contribution of *pencak silat* and martial arts to students' character development. Synthesising 20 studies across diverse designs and settings, it found that martial arts can foster self-regulation, moral and value-based character, self-esteem, and transferable life skills, but that these benefits are conditional on traditional emphasis, intentional pedagogy, and supportive educational contexts rather than automatic consequences of participation. Several rigorous studies reported null or adverse outcomes, underscoring that martial arts are promising but not guaranteed vehicles for character formation. Values and moral character and self-regulation were the most frequently reported outcomes. *Pencak silat*, despite its cultural and educational prominence, remained markedly under-researched. Educators and policymakers should therefore treat martial arts as a resource to be designed deliberately for character outcomes, and researchers should prioritise rigorous, mechanism-focused, and context-sensitive studies, especially of *pencak silat*.

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