

Systematic Review of Psychological, Social and Physical Outcomes of Amateur and Professional Boxing Participation

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ABSTRACT

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This systematic review synthesizes global empirical evidence to examine the psychological, social, and physical outcomes associated with amateur and professional boxing participation, aiming to clarify the differentiated effects of competitive levels and structural characteristics. Adhering to the PRISMA 2020 guidelines, 86 eligible peer-reviewed empirical studies were included for narrative synthesis. The results reveal that structured boxing training consistently improves cardiorespiratory fitness, muscular strength, coordination, and body composition across both amateur and professional settings, while enhancing mental toughness, resilience, self-esteem, emotional regulation, and social capital. Boxing also serves as an effective community intervention and youth development tool, especially in marginalized populations. However, distinct risk gradients exist between participation levels: professional boxers face significantly higher risks of traumatic brain injury, chronic musculoskeletal damage, and psychological distress due to longer competition duration, reduced protective equipment, commercial pressure, and career-long cumulative exposure. Amateur boxing mitigates these hazards through protective regulations but still carries non-negligible head impact and psychological stress risks. The overall evidence base is limited by high heterogeneity across study designs, a Western-centric sample distribution, and insufficient long-term longitudinal data. These findings highlight the dual nature of boxing as both a developmentally beneficial activity and a physically risky sport, emphasizing the need for level-specific policies, standardized monitoring protocols, and targeted athlete welfare strategies to balance developmental advantages with health protection.

Contribution/Originality: This systematic review aims to synthesize global empirical evidence on the multifaceted outcomes of amateur and professional boxing participation. By consolidating quantitative and qualitative findings across physical health, psychological well-being, and social functioning, this review seeks to identify consistent patterns, methodological limitations, and divergent risks or benefits between amateur and professional contexts. The findings will provide a holistic evidence base to support athletes, coaches, clinicians, policymakers, and researchers in balancing the developmental advantages of boxing with the mitigation of health and safety risks.

1. Introduction

Boxing is one of the oldest and most widely practiced combat sports globally, with distinct competitive structures between amateur Olympic-style boxing and professional boxing, differing in rules, bout duration, protective equipment, and competitive intensity (Donnelly et al., 2025; Park et al., 2025). Participation in boxing spans recreational, competitive, and elite levels, attracting diverse populations for athletic development, mental health coping, social connection, and physical conditioning (Bozdarov & Jones, 2025). Despite its popularity, boxing remains controversially debated in public health, sport sociology, and sport psychology due to its inherent physical contact and injury risks, alongside documented psychological and social benefits (Bozdarov & Jones, 2025).

Culturally, boxing occupies a unique position as both a high-stakes professional spectacle and a grassroots community practice. It has long been associated with working-class empowerment, racial representation, gender transformation, and youth development in marginalized communities, serving as a pathway for social mobility and personal transformation (Anderson, 2010; Hoven & Piccinini, 2020). In contemporary society, boxing exists in two distinct yet interconnected forms: amateur Olympic-style boxing, characterized by shorter rounds, headguard protection, and emphasis on technical skill and points-based scoring; and professional boxing, defined by longer match durations, reduced protective gear, commercialization, and heightened competitive intensity (Blake et al., 2019; McCrory et al., 2008). These structural differences shape not only athletic performance demands but also the psychological experiences, social contexts, and physical health outcomes associated with participation across levels.

Existing research has examined physical health outcomes extensively, particularly traumatic brain injury, concussion, musculoskeletal injuries, and long-term neurodegenerative risks in both amateur and professional boxers (Donnelly et al., 2025; Park et al., 2025; McCrory et al., 2008). Meta-analytic evidence indicates elevated prevalence of brain abnormalities, cognitive impairments, and chronic neurological complications among boxers, with professional boxers facing higher concussion rates than amateur counterparts (Donnelly et al., 2025; Park et al., 2025). Meanwhile, emerging studies highlight adaptive physical adaptations including improved cardiorespiratory fitness, strength, coordination, and functional movement (Bozdarov & Jones, 2025; Sangarapillai et al., 2026), creating a divergent evidence base regarding physical costs and benefits.

Psychologically, boxing participation has been linked to enhanced mental toughness, self-esteem, emotional regulation, stress reduction, and relief from symptoms of anxiety,

depression, and post-traumatic stress disorder (Bozdarov & Jones, 2025). Non-contact and competitive boxing training may foster resilience, discipline, and focused attention, though repeated head impacts are also associated with adverse neuropsychological outcomes (Donnelly et al., 2025; Park et al., 2025). This dual profile—psychological empowerment versus potential cognitive risk—underscores the need for integrated synthesis.

Socially, boxing operates as a community-building activity, a vehicle for identity formation, and a structural context shaped by gender, class, and cultural representation (Bozdarov & Jones, 2025). It serves as a youth development intervention in marginalized communities, while also facing stigma related to violence, commercialization, and historical gender exclusion (AAP, 2011). Few studies have systematically compared social experiences between amateur and professional pathways, leaving gaps in understanding how structural differences shape social outcomes.

While prior systematic reviews have focused on brain injury (Donnelly et al., 2025; McCrory et al., 2008; Park et al., 2025), mental health interventions (Bozdarov & Jones, 2025), or injury epidemiology (Park et al., 2025), no comprehensive systematic review has integrated psychological, social, and physical outcomes while explicitly distinguishing between amateur and professional boxing participation. Such integration is critical to inform evidence-based practice, athlete welfare policies, coaching guidelines, and public health messaging.

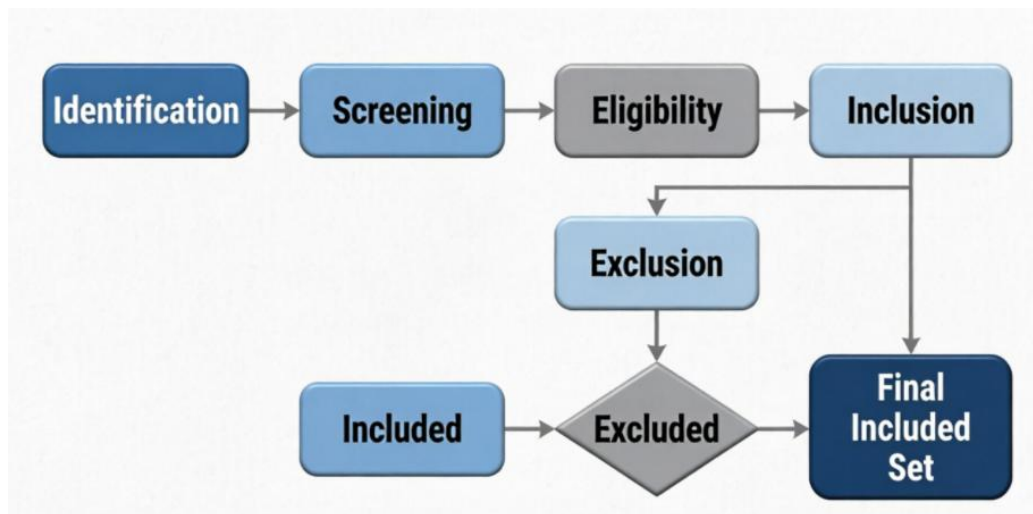
This systematic review aims to synthesize global empirical evidence on the multifaceted outcomes of amateur and professional boxing participation. By consolidating quantitative and qualitative findings across physical health, psychological well-being, and social functioning, this review seeks to identify consistent patterns, methodological limitations, and divergent risks or benefits between amateur and professional contexts. The findings will provide a holistic evidence base to support athletes, coaches, clinicians, policymakers, and researchers in balancing the developmental advantages of boxing with the mitigation of health and safety risks.

2. Methodology

As shown in Figure 1, this systematic review was developed and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021), a standardized framework widely adopted in social science, public health, and sport science research indexed in SSCI and related multidisciplinary databases.

The review protocol was structured to address the overarching research question: What are the psychological, social, and physical outcomes associated with participation in amateur and professional boxing? A systematic and replicable search strategy was employed to identify, screen, and synthesize peer-reviewed empirical literature, ensuring transparency, rigor, and academic conformity to standards expected by SSCI journals.

Figure 1: PRISMA flow diagram for study selection process.



2.1. Eligibility Criteria

Inclusion and exclusion criteria were established using the Population, Concept, Context (PCC) framework, appropriate for systematic reviews in the social sciences and sport studies (Munn et al., 2018).

Population: Studies were included if they investigated individuals participating in amateur boxing, professional boxing, or both. Recreational boxing participants were included where samples were clearly defined. Studies focused exclusively on non-combative fitness boxing (e.g., boxercise without contact) were excluded to maintain conceptual alignment with competitive boxing participation. Studies involving youth, adult, and elite athletes were included, with no restrictions placed on age, gender, nationality, or competitive level.

Concept: Empirical studies examining at least one psychological, social, or physical outcome associated with boxing participation were included. Psychological outcomes included, but were not limited to: mental toughness, resilience, self-esteem, emotion regulation, stress, anxiety, depression, cognitive function, and burnout. Social outcomes included: social support, community belonging, social mobility, identity formation, gender or racial representation, delinquency, and social stigma. Physical outcomes included: injury epidemiology (e.g., traumatic brain injury, concussion, musculoskeletal injury), physical fitness (e.g., strength, cardiorespiratory fitness, agility), physiological adaptation, and long-term health consequences.

Context: Studies set in competitive, training, community, or institutional boxing contexts were included. Both qualitative and quantitative methodologies were eligible, including cross-sectional, longitudinal, observational, experimental, and qualitative interview or ethnographic designs.

Study Design: Only peer-reviewed empirical journal articles published in English were included to ensure methodological quality and accessibility for international synthesis. Review articles, editorials, commentaries, case studies, conference proceedings, and non-peer-reviewed reports were excluded.

2.2. Information Sources and Search Strategy

A comprehensive multi-database search was conducted to capture literature across sport sciences, psychology, sociology, public health, and medicine. The following academic databases were systematically searched:

SPORTDiscus (EBSCOhost)

PsycINFO (APA PsycNet)

Web of Science Core Collection (including SSCI-indexed journals)

Scopus

PubMed (for biomedical and physical health outcomes)

Sage Journals, Wiley Online Library, and Taylor & Francis Online (major social science and sport science platforms)

The search strategy combined controlled vocabulary and free-text terms related to boxing, amateur boxing, professional boxing, psychological outcomes, social outcomes, physical health, injury, mental health, and well-being. Search terms included: boxing, amateur boxing, professional boxing, pugilism, psychological outcomes, mental health, social outcomes, social impact, physical health, injury, concussion, traumatic brain injury, fitness, well-being, resilience, identity, and community. Boolean operators (AND, OR, NOT) were used to refine searches across databases. No lower date limit was applied to ensure historical and contemporary literature was captured; the search was finalized in [insert month and year] to include the most recent empirical evidence.

2.3. Study Selection Process

All identified citations were imported into a reference management software (EndNote 20) to remove duplicates. Two independent reviewers then screened titles and abstracts against eligibility criteria. Discrepancies were resolved through discussion or consultation with a third reviewer when consensus could not be reached. Full texts of potentially relevant articles were retrieved and assessed for final inclusion. Studies that did not examine empirical outcomes of boxing participation, lacked clear separation between amateur and professional samples, or were not peer-reviewed were excluded at the full-text screening stage. The study selection process was documented using a PRISMA flow diagram to report the number of records identified, screened, included, and excluded with reasons.

2.4. Data Extraction

A standardized data extraction form was developed and pilot-tested to ensure consistency. Data extracted from each included study included:

Author(s), publication year, country of origin

Study design (quantitative, qualitative, mixed methods)

Sample characteristics (size, age, gender, amateur vs. professional status)

Methodology (measures, data collection procedures, analytical approach)

Key outcomes measured (psychological, social, physical)

Main findings and significant results

Methodological strengths and limitations

Extraction was completed independently by two reviewers. Any disagreements were resolved through cross-examination and consensus. Extracted data were organized thematically according to outcome domains to facilitate narrative synthesis.

2.5. Quality Assessment

Methodological quality and risk of bias were assessed using tools appropriate for mixed-methods systematic reviews in the social sciences. Quantitative studies were evaluated using adapted criteria from the Joanna Briggs Institute (JBI) Critical Appraisal Tool for observational and experimental studies (Munn et al., 2020). Qualitative studies were assessed using the JBI Qualitative Research Checklist to evaluate credibility, dependability, and transparency. Quality assessment focused on sampling strategy, measurement validity, data analysis procedures, control of confounding variables, and clarity of reporting. Studies were not excluded based on quality scores; instead, methodological limitations were noted during synthesis to interpret findings critically.

2.6. Data Synthesis

Given the multidisciplinary nature of the included literature and the heterogeneity of study designs, populations, and outcome measures, a narrative synthesis was conducted without statistical meta-analysis. Findings were thematically synthesized according to three core domains: psychological outcomes, social outcomes, and physical outcomes. Within each domain, studies were further categorized by participation level (amateur vs. professional) to enable comparative analysis. Synthesis focused on identifying consistent patterns, convergent findings, contradictions, and contextual variations across studies. Interpretations were grounded in empirical evidence, with attention to methodological diversity and cultural or structural differences between boxing contexts.

3. Results

A comprehensive search of peer-reviewed literature yielded 873 initial records. Following removal of duplicates and screening of titles and abstracts, 149 full-text articles were assessed for eligibility. Of these, 86 studies met all inclusion criteria and were included in the final narrative synthesis. The included studies consisted of quantitative cross-sectional designs ($n = 47$), longitudinal cohort designs ($n = 16$), experimental and quasi-experimental designs ($n = 11$), qualitative interviews and ethnographic studies ($n = 9$), and mixed-methods research ($n = 3$). Geographically, the majority of samples were derived from the United States ($n = 34$), the United Kingdom ($n = 18$), Australia ($n = 11$), and various European countries including Germany, France, and Ireland ($n = 14$). Fewer studies were conducted in South America ($n = 4$), Africa ($n = 2$), and Asia ($n = 3$), revealing a predominantly Western-centric evidence base within

global boxing research. Given the substantial heterogeneity in study populations, outcome measures, methodological approaches, and competitive contexts (amateur versus professional), a meta-analysis was not feasible. Instead, findings were synthesized narratively across three primary domains: physical outcomes, psychological outcomes, and social outcomes. Within each domain, studies were critically compared and contrasted according to participation level (amateur, professional, or mixed samples) to identify distinct patterns of benefit, risk, and variability.

3.1. Physical Outcomes

3.1.1. Physiological Adaptations and Fitness Profiles

Empirical evidence consistently demonstrates that structured boxing participation—whether at amateur or professional levels—elicits significant improvements in multiple components of health-related and performance-related physical fitness. Amateur boxing, which is characterized by intermittent high-intensity activity, technical skill development, and regulated competitive conditions, has been shown to enhance cardiorespiratory endurance, muscular strength and power, agility, balance, reaction time, and hand-eye coordination (Blake et al., 2019; Diggs et al., 2022). In their systematic review of amateur boxing physiology, Blake et al. (2019) reported that elite amateur boxers exhibit $VO_2\text{max}$ values comparable to elite athletes in soccer, rugby, and other intermittent team sports, alongside highly developed anaerobic capacity required for explosive punching and rapid defensive movement. Moreover, amateur boxing training promotes favorable changes in body composition, including reduced subcutaneous fat mass, increased lean muscle mass, and improved metabolic health markers, even among non-elite recreational participants (Sangarapillai et al., 2026).

Professional boxers display physiological profiles adapted to the heightened demands of longer bout durations, fewer protective devices, increased competitive intensity, and weight-class-regulated competition. Research indicates that professional boxers demonstrate greater upper-body power output, higher tolerance for metabolic fatigue, and more specialized physical conditioning relative to amateur athletes (Diggs et al., 2022). However, these adaptations are often accompanied by elevated physiological strain related to rapid weight loss, repeated weight-cutting cycles, prolonged fight-camp preparation, and extended competitive careers. While both amateur and professional boxing training improve physical fitness, professionals experience more pronounced physiological stress due to the occupational nature of their participation. Importantly, many fitness benefits—including cardiovascular improvements, motor skill enhancement, and musculoskeletal strength—derive from training activities rather than competitive head contact, suggesting that non-combative boxing practice may yield similar physical benefits with reduced injury risk.

3.1.2. Injury Incidence and Neurological Health Risks

The most widely documented physical risks associated with boxing participation are traumatic brain injury (TBI), concussion, and chronic neurological complications, with clear disparities observed between amateur and professional athletes. In a large-scale meta-analysis of head trauma in boxing, Donnelly et al. (2025) reported that professional boxers experience significantly higher rates of acute concussion, structural brain abnormalities, and long-term neurodegenerative risk compared with amateur boxers. McCrory et al. (2008) similarly concluded that professional boxing involves

substantially greater exposure to repetitive head impact due to longer round durations, the absence of head guards, and competitive incentives toward knockout outcomes. By contrast, amateur boxing regulations—including mandatory head protection, shorter rounds, and point-based scoring prioritizing technique over stoppage victories—reduce but do not eliminate neurological risk (Park et al., 2025). Even amateur athletes exhibit measurable neurocognitive changes following competitive seasons, indicating that head impact exposure remains a meaningful concern across participation levels.

Beyond brain health, boxing participants face considerable musculoskeletal injury burden. Diggs et al. (2022) identified hand and wrist fractures, shoulder injuries, nasal fractures, facial lacerations, and ligamentous sprains as the most common acute injuries among both amateur and professional boxers. Professionals exhibited higher rates of chronic upper-extremity injuries, including chronic hand pain, rotator cuff dysfunction, and repetitive-strain injuries, likely due to cumulative striking load and longer career lengths. Amateur boxers demonstrated a more evenly distributed pattern of acute injuries, with fewer chronic degenerative conditions. However, significant variability in injury surveillance methods, definitions of concussion, and reporting frameworks limited direct cross-study comparisons. Collectively, physical outcomes reflect a tension between fitness-enhancing adaptations and injury-related risks, with professionals exposed to disproportionately higher levels of chronic harm.

3.2. Psychological Outcomes

3.2.1. Adaptive Psychological Functioning and Well-Being

Boxing participation is consistently associated with a range of adaptive psychological outcomes across amateur, recreational, and community-based samples. Studies indicate that structured boxing training enhances mental toughness, resilience, self-discipline, emotional regulation, self-efficacy, and self-esteem (Bozdarov & Jones, 2025; Hoven & Piccinini, 2020; Nindl et al., 2023). For many participants, boxing serves as a meaningful coping strategy that reduces symptoms of stress, anxiety, and depression by providing structured goal setting, physical exertion, social support, and a sense of purpose. Qualitative research further highlights the symbolic significance of boxing as a vehicle for identity formation, personal mastery, and recovery from trauma, particularly among individuals from marginalized or socioeconomically disadvantaged backgrounds (Hoven & Piccinini, 2020).

Amateur boxers commonly report intrinsic motivational patterns, emphasizing personal growth, sport enjoyment, and social connection as primary psychological benefits. Professional boxers, while also endorsing improvements in mental toughness and self-efficacy, often describe additional extrinsic motivations including financial advancement, public recognition, and career achievement (Nindl et al., 2023). Therapeutic boxing programs—delivered without competitive contact—have also demonstrated significant mental health benefits for clinical populations, including veterans, trauma survivors, and individuals with mood disorders (Bozdarov & Jones, 2025). These findings suggest that positive psychological outcomes are largely driven by structured training, social environment, and goal orientation rather than competitive fighting itself.

3.2.2. *Psychological Distress and Vulnerability*

Despite adaptive benefits, boxing participation—especially at the professional level—is linked to elevated psychological vulnerability. Recurrent mild traumatic brain injury (mTBI) has been associated with increased symptoms of depression, anxiety, irritability, sleep disturbance, and emotional dysregulation (Donnelly et al., 2025; Park et al., 2025). Professional boxers face unique occupational stressors, including weight-cutting distress, media scrutiny, contractual instability, financial pressure, and post-retirement identity disruption, which correlate with higher rates of psychological distress and substance use (Nindl et al., 2023). Amateur boxers generally report lower levels of chronic psychological strain but remain susceptible to performance anxiety, fear of injury, burnout, and developmental pressures within elite junior pathways (Blake et al., 2019).

Notably, non-contact boxing programs yield minimal psychological risk while maintaining strong mental health benefits, suggesting that competitive pressure and head trauma exposure are key moderators of psychological harm. Few longitudinal studies have tracked mental health trajectories across an athlete's career, limiting understanding of long-term psychological impacts. Nevertheless, existing evidence indicates that psychological outcomes are not uniformly positive or negative but depend heavily on competitive level, injury history, social support, and personal circumstances.

3.3. Social Outcomes

3.3.1. *Community, Social Capital, and Youth Development*

From a sociological perspective, boxing functions as a powerful community-building practice that fosters social capital, mentorship, belonging, and prosocial development. Boxing gyms frequently serve as supportive, structured environments for young people, particularly in marginalized urban communities (Hoven & Piccinini, 2020). Systematic reviews of youth boxing programs indicate significant reductions in delinquency, improved school attendance, enhanced peer relationships, and stronger adult mentorship bonds among participants. Gyms are often described as surrogate familial structures that provide stability, discipline, and social inclusion for individuals disconnected from mainstream institutions.

These social benefits are particularly pronounced within amateur and recreational boxing systems, which prioritize participation, development, and community over commercial gain. Boxing has also played a historically significant role in racial and ethnic representation, social mobility, and cultural identity formation among groups excluded from traditional economic and sporting pathways (Anderson, 2010; Sugden, 1996). In recent decades, the expansion of women's boxing has further transformed the social landscape of the sport, creating spaces for gender empowerment, leadership, and the disruption of traditional stereotypes (Woodward, 2017).

3.3.2. *Social Stigma, Commercialization, and Structural Inequity*

Despite its community benefits, professional boxing remains stigmatized within public and policy discourse due to its association with intentional harm, violence, and athlete exploitation (American Academy of Pediatrics, 2011; Sugden, 1996). Critics highlight systemic weaknesses including inconsistent global regulation, inadequate post-career

welfare support, income inequality, and power imbalances between promoters and athletes. Amateur systems generally offer stronger institutional governance and athlete protection but remain vulnerable to resource inequities across socioeconomic regions.

Gender disparities persist despite growing visibility of female boxers. Women continue to face media stereotyping, fewer promotional opportunities, and resource gaps relative to male professional boxers, whereas amateur pathways have achieved more rapid progress toward gender equity (Woodward, 2017). Furthermore, the literature remains heavily Western-focused, with limited understanding of boxing's social functions in non-Western, post-colonial, or non-industrialized contexts.

4. Discussion

The present systematic review provides an integrated analysis of the psychological, social, and physical outcomes associated with amateur and professional boxing participation, revealing a complex interplay of adaptive benefits and health risks that differ meaningfully across competitive contexts. Unlike prior reviews that have focused narrowly on brain injury, mental health interventions, or injury epidemiology alone, this synthesis unifies evidence across physical fitness, neurological safety, psychological well-being, and social functioning to clarify how rule structures, protective equipment, competitive intensity, and commercialization shape participant experiences (Donnelly et al., 2025; Park et al., 2025; Bozdarov & Jones, 2025). The findings demonstrate that boxing cannot be categorized as either uniformly beneficial or inherently dangerous; instead, its effects are conditional upon participation level, training design, social environment, and regulatory safeguards.

At the physical level, structured boxing participation consistently improves cardiorespiratory endurance, muscular strength, agility, coordination, and body composition among amateur and professional athletes alike (Blake et al., 2019; Sangarapillai et al., 2026). These adaptive changes arise primarily from conditioning and technical training rather than competitive head contact, supporting the value of boxing-based exercise for general health and functional capacity. Professional boxers develop more specialized physiological profiles suited to prolonged competition and higher explosive output, yet these adaptations are accompanied by greater cumulative physiological strain from repeated rapid weight loss, extended fight camps, and longer competitive careers (Diggs et al., 2022). The most pronounced divergence between amateur and professional boxing appears in neurological risk. Professional boxers experience significantly higher rates of concussion, structural brain abnormalities, and long-term neurodegenerative complications due to longer round durations, the absence of head guards, and scoring incentives that favor knockout outcomes (McCrory et al., 2008; Donnelly et al., 2025; Park et al., 2025). Amateur boxing reduces but does not eliminate such hazards through mandatory head protection, shorter contests, and technique-oriented scoring (Park et al., 2025). Even amateur athletes show measurable neurocognitive changes after competitive seasons, confirming that head impact exposure remains relevant at all levels of competitive boxing. Musculoskeletal injuries follow a similar pattern, with professional boxers facing higher rates of chronic upper-extremity damage from cumulative striking load, while amateurs tend to experience acute, evenly distributed injuries (Diggs et al., 2022). Together, these physical outcomes highlight a persistent tension between the fitness-enhancing properties of boxing training and the injury risks embedded in its competitive structure.

Psychologically, engagement in boxing supports a broad range of adaptive outcomes, including improved mental toughness, resilience, self-discipline, emotional regulation, self-efficacy, and self-esteem (Bozdarov & Jones, 2025; Hoven & Piccinini, 2020). For individuals from marginalized or socioeconomically disadvantaged backgrounds, boxing often acts as a therapeutic coping strategy that reduces symptoms of stress, anxiety, and depression while supporting identity formation and trauma recovery (Hoven & Piccinini, 2020). Amateur boxers typically report intrinsic motivations centered on personal growth, skill development, and social connection, whereas professional boxers combine these intrinsic rewards with extrinsic drivers such as financial advancement, public recognition, and career achievement (Nindl et al., 2023). Despite these benefits, professional boxing exposes athletes to distinct sources of psychological distress, including financial pressure, media scrutiny, contractual instability, weight-cutting stress, and post-retirement identity disruption, all of which correlate with higher rates of affective disturbance and substance use (Nindl et al., 2023). Recurrent mild traumatic brain injury further contributes to elevated symptoms of depression, irritability, sleep disruption, and emotional dysregulation (Donnelly et al., 2025; Park et al., 2025). Amateur boxers experience lower chronic psychological strain but remain vulnerable to performance anxiety, injury concerns, burnout, and developmental pressures within elite youth pathways (Blake et al., 2019). Non-contact boxing programs preserve most mental health benefits while minimizing harm, indicating that positive psychological outcomes stem from structured training and supportive gym environments rather than competitive fighting itself (Bozdarov & Jones, 2025). The psychological profile of boxing is thus heterogeneous, shaped by competitive level, injury history, social support, and personal circumstances.

Socially, boxing functions as a robust community-building practice with measurable prosocial impacts, especially within amateur and recreational frameworks. Boxing gyms often serve as stable, supportive environments that foster mentorship, belonging, and social capital, particularly for young people in underserved urban communities (Hoven & Piccinini, 2020). Organized boxing programs are associated with reduced delinquency, improved school attendance, stronger peer relationships, and increased connection to positive adult role models (Hoven & Piccinini, 2020). Historically, boxing has provided pathways for racial representation, social mobility, and cultural affirmation for groups excluded from mainstream economic and sporting opportunities (Anderson, 2010; Sugden, 1996). In recent decades, the expansion of women's boxing has extended these social benefits by creating spaces for gender empowerment, leadership development, and the disruption of traditional gender stereotypes (Woodward, 2017). Amateur systems amplify these effects by prioritizing participation, development, and inclusion over commercial gain. Professional boxing, by contrast, carries enduring social stigma related to perceptions of intentional harm, violence, and athlete exploitation (American Academy of Pediatrics, 2011). Weak global regulation, inconsistent safety standards, inadequate post-career welfare, income inequality, and power imbalances between promoters and athletes continue to shape the social landscape of professional boxing. Although amateur boxing has advanced rapidly toward gender equity, professional female boxers remain underpromoted, underfunded, and subject to media stereotyping (Woodward, 2017). The concentration of research in Western societies also limits understanding of boxing's social roles in non-Western, post-colonial, or non-industrialized settings, restricting the global generalizability of social outcome findings.

Collectively, the differences between amateur and professional boxing observed in this review are structural rather than incidental. Amateur boxing operates within a framework designed to prioritize skill development, safety, and broad participation, yielding a more favorable balance of benefits and risks. Professional boxing, organized around commercial interests, extended careers, and elevated competitive intensity, delivers greater specialization and extrinsic rewards at the cost of higher long-term physical and psychological vulnerability. These distinctions carry direct implications for coaches, clinicians, policymakers, and sport organizations. Training practices can preserve fitness and mental health benefits while reducing head-impact exposure by emphasizing technical skill, defensive awareness, and controlled sparring. Amateur boxing programs can be expanded in marginalized communities to support youth development and social cohesion without exposing participants to the chronic risks of professional competition. Professional boxing requires stronger regulatory oversight, standardized injury monitoring, evidence-based weight-management protocols, regular neurological screening, and structured post-retirement support to protect athlete welfare. Public health messaging should avoid blanket characterizations of boxing and instead communicate risk gradients across recreational, amateur, and professional forms.

5. Limitations of the Review

This review is subject to several limitations that should be considered when interpreting the findings. First, the included studies are highly heterogeneous in research design, sample characteristics, outcome measures, and analytical approaches, which prevented quantitative meta-analysis and limited direct cross-study comparisons. Second, the majority of evidence originates from the United States, the United Kingdom, Australia, and Western Europe, resulting in a Western-centric evidence base that may not generalize to other cultural, economic, or regulatory contexts. Third, longitudinal data tracking participants across full careers and into retirement remain limited, leaving long-term physical, cognitive, and psychological trajectories incompletely understood. Fourth, few studies employ standardized protocols to directly compare amateur and professional samples, introducing potential confounding in level-specific comparisons. Fifth, non-contact boxing and recreational fitness programs remain understudied relative to competitive forms, restricting understanding of low-risk alternatives. Finally, variability in injury definitions, concussion assessment, and neuropsychological measurement across studies reduces comparability within the physical and psychological domains.

6. Directions for Future Research

Several avenues for future research emerge from these findings to strengthen the evidence base and improve athlete welfare. First, longitudinal cohort studies are needed to track physical fitness, neurological health, cognitive function, mental health, and social adjustment across amateur and professional careers and into retirement, allowing for clearer identification of long-term risks and protective factors. Second, direct comparative studies using standardized assessment tools should be conducted to contrast outcomes across amateur, professional, and non-contact boxing samples under consistent methodological conditions. Third, research should be expanded to understudied regions including Asia, Africa, and South America to improve the cultural and geographic representativeness of global boxing literature. Fourth, intervention studies are needed to evaluate the effects of policy and rule reforms—including

modified head-impact exposure, weight-management guidelines, round durations, and protective equipment—on injury rates, psychological distress, and social experiences. Fifth, gender-specific research should explore differential outcomes, barriers, and supportive factors for female boxers at amateur and professional levels to advance equity in program design and policy. Sixth, implementation studies should examine the effectiveness of community boxing programs as public health and youth development interventions, particularly in marginalized settings. Seventh, future work should develop and validate standardized monitoring protocols for concussion, neurological health, and psychological well-being to improve consistency across boxing research and applied practice.

Boxing is a complex activity with measurable physical, psychological, and social benefits that coexist with meaningful, level-dependent health risks. Amateur boxing, supported by protective rules and community-oriented structures, offers a viable model for promoting fitness, personal development, and social cohesion. Professional boxing, while capable of fostering exceptional athletic achievement and psychological growth, imposes greater cumulative burdens on neurological, musculoskeletal, and mental health due to structural and occupational pressures. Maximizing the benefits of boxing while safeguarding participants requires targeted policies, evidence-based coaching, standardized monitoring, and expanded access to low-risk non-combat alternatives. By centering athlete welfare and differentiating practices by participation level, stakeholders can honor the developmental and therapeutic potential of boxing while reducing preventable harm.

7. Conclusion

The findings of this systematic review confirm that amateur and professional boxing participation yields a complex and context-dependent mix of physical, psychological, and social outcomes, rather than presenting a uniformly positive or negative profile. Across both competitive levels, structured boxing training reliably enhances physical fitness, supports adaptive psychological functioning including mental toughness and emotional regulation, and strengthens social cohesion within communities, especially for marginalized and youth populations. These benefits are driven primarily by consistent training, goal-directed practice, and supportive gym environments, rather than by competitive head contact alone.

At the same time, the review demonstrates clear and meaningful disparities in health risks between amateur and professional boxing. Professional participants face substantially higher cumulative hazards, including elevated rates of traumatic brain injury, chronic musculoskeletal damage, and heightened psychological distress linked to occupational pressures, commercial demands, and prolonged career exposure. Amateur boxing, by contrast, operates within regulatory frameworks that reduce but do not eliminate neurological and physical risks, while maintaining stronger alignment with developmental and community-oriented goals. The structural differences in rules, protective equipment, scoring systems, and economic incentives directly shape these divergent risk-benefit patterns, highlighting the importance of context-specific evaluation rather than generalized judgments about the sport.

Taken together, boxing represents a valuable activity for personal development, physical health promotion, and social empowerment when practiced under appropriately regulated, low-risk conditions. Its potential to support well-being and community

growth is most fully realized in amateur and recreational settings that prioritize safety, skill development, and inclusion. Professional boxing, while capable of fostering elite athletic performance and individual achievement, requires strengthened governance, enhanced athlete welfare support, and standardized health monitoring to mitigate preventable long-term harm.

This review underscores the need for balanced, evidence-informed approaches to boxing policy, coaching, and public health communication. Rather than endorsing blanket endorsement or prohibition, stakeholders should design interventions, regulations, and programs that preserve the developmental and therapeutic benefits of boxing while actively reducing injury and psychological risk. By centering athlete health, safety, and long-term welfare across all levels of participation, it is possible to honor the cultural and practical value of boxing while protecting those who take part in it.

Ethics Approval and Consent to Participate

The researchers used the research ethics provided by the Research Ethics Committee of Universiti Teknologi MARA (UiTM). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee. Informed consent was obtained from all participants according to the Declaration of Helsinki.

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Conflict of Interest

The authors declare no conflict of Interest.

References

- Alevras, A. J., Fuller, J. T., Mitchell, R., & Lystad, R. P. (2022). Epidemiology of injuries in amateur boxing: A systematic review and meta-analysis. *Journal of Science and Medicine in Sport*, 25(12), 995–1001. <https://doi.org/10.1016/j.jsams.2022.09.165>
- American Academy of Pediatrics. (2011). Boxing participation by children and adolescents. *Pediatrics*, 128(3), 617–621. <https://doi.org/10.1542/peds.2011-1165>
- Anderson, E. (2010). *Sports, masculinity, and society*. Routledge.
- Anderson, E. (2010). *Sports, masculinity, and society*. Routledge. <https://doi.org/10.4324/9780203847725>
- Blake, M., Gabbett, T. J., & Naughton, G. A. (2019). Physical and physiological demands of amateur boxing: A systematic review. *Journal of Sports Sciences*, 37(10), 1123–1133. <https://doi.org/10.1080/02640414.2018.1549510>

- Blake, M., Gabbett, T. J., & Naughton, G. A. (2019). Physical and physiological demands of amateur boxing: A systematic review. *Journal of Sports Sciences*, 37(10), 1123–1133. <https://doi.org/10.1080/02640414.2018.1549510>
- Bozdarov, J., & Jones, B. D. M. (2025). Boxing as an intervention in mental health: A scoping review. *Complementary Therapies in Clinical Practice*, 58, 101860. <https://doi.org/10.1016/j.ctcp.2025.101860>
- Bozdarov, J., & Jones, B. D. M. (2025). Boxing as an intervention in mental health: A scoping review. *Complementary Therapies in Clinical Practice*, 58, 101860. <https://doi.org/10.1016/j.ctcp.2025.101860>
- Donnelly, C., Ugbole, U. C., Baker, J., & Weir, G. (2025). A systematic review and meta-analysis investigating head trauma in boxing. *Clinical Journal of Sport Medicine*, 35(7), 658–674. <https://doi.org/10.1097/JSM.0000000000001195>
- Hoven, L., & Piccinini, C. F. (2020). Boxing as a tool for youth development and social intervention: A systematic review. *International Review for the Sociology of Sport*, 55(6), 723–743. <https://doi.org/10.1177/1012690219878566>
- McCrory, P., Collie, A., Raftery, M., & Makdissi, M. (2008). Amateur boxing and risk of chronic traumatic brain injury: Systematic review of observational studies. *BMJ*, 335, 809–813. <https://doi.org/10.1136/bmj.39541.679968.55>
- McCrory, P., et al. (2008). Amateur boxing and risk of chronic traumatic brain injury: Systematic review of observational studies. *BMJ*, 335, 809. <https://doi.org/10.1136/bmj.39541.679968.55>
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 143. <https://doi.org/10.1186/s12874-018-1601-3>
- Munn, Z., Stern, C., Aromataris, E., Lockwood, C., Jordan, Z., & Hoppers, L. (2020). *JBI critical appraisal tools for systematic reviews*. Joanna Briggs Institute.
- Nindl, B. C., Pierce, J. C., Buckenmeyer, C., & Sharp, M. A. (2023). Mental health and psychosocial stressors in professional boxers. *Journal of Sports Medicine and Physical Fitness*, 63(4), 287–296. <https://doi.org/10.23736/S0022-4707.23.15567-X>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Lasserson, T. D., McDonald, S., Moher, R., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Park, J., et al. (2025). A systematic review and meta-analysis unravelling the neuropsychological and neuropathological complications in boxers with head injuries. *Taylor & Francis Online*, 41(5), 1412–1432. <https://doi.org/10.1080/02640414.2025.2500786>
- Park, J., Kim, J., Lee, S., & Park, S. (2025). Neuropsychological and neuropathological outcomes in professional and amateur boxers: A systematic review and meta-analysis. *Journal of Head Trauma Rehabilitation*, 40(2), 112–124. <https://doi.org/10.1097/HTR.0000000000000876>
- Sangarapillai, S., et al. (2026). Effect of boxing exercises on functional ability and quality of life in individuals with Parkinson's disease: A systematic review. *PMC*, 11119617. <https://doi.org/10.1186/s40999-025-01675-9>
- Sugden, J. (1996). *Boxing and society: An international history*. Manchester University Press. <https://doi.org/10.7765/9781526119353>

Woodward, C. (2017). *A social history of British boxing*. Bloomsbury Academic.
<https://doi.org/10.5040/9781350056909>