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## Abstract

Combat sports, such as wrestling, boxing, and martials arts, have increased in popularity in recent years, particularly among young people. This increased attention has been mirrored within the scholarly literature on combat sports and their effects on young people's physical and socioemotional development. The verdict as to whether these impacts have been largely positive or negative, however, remains mixed. This article details the purported benefits of combat sports for youth athletes, citing evidence of value cultivation, protective effects against bullying, and interpersonal competency development. It then proceeds to outline how these competencies connect to improved academic and professional outcomes. At the same time, however, the article is careful to acknowledge the negative impacts of youth participation in combat sports. By examining the physiological and psychological effects of the rapid weight loss often implicitly promoted by combat sports, this article frames these impacts as decidedly mixed. To sway the effects more towards the side of benefits than risks, it concludes with concrete recommendations for intervention. These interventions will ideally guide both policy and practice to help ensure that combat sports continue to be a positive presence in the lives of young athletes throughout the world.

**Combat Sports: Friend or Foe to Youth's Socioemotional and Physical Development?**

The popularity of various sports spans millennia, dating all the way back to the first Olympic Games held in Athens in 776 BCE (International Olympic Committee, n.d.). This enduring interest in diverse sports has not waned throughout the years and has become an integral part of even the youngest of athletes' lives. Sports differ in the equipment required, the playing field, arena, or pitch, as well as the rules of play they adopt. But one thing remains the same: an athlete of any sport needs discipline, motivation, and a strong work ethic to succeed. This message has become a part of the core ethos for many combat sports.

Rooted in a historical philosophy of self-defense, combat sports are a form of martial arts that "focus on competitive performance, technical effectiveness, and physical conditioning" (Hanover Boxing Club, n.d.). Common examples of combat sports include boxing, kickboxing, or Muay Thai (a Thai variant of the two), and generally include two individuals going head-to-head to inflict bodily harm—after all, this supplies the criteria for how points are awarded in each round. Perhaps this is why the idea of letting people, especially children and young adults, participate in such activities is often heavily frowned upon or met with a great deal of suspicion. Indeed, combat sports are often at the end of much criticism and skepticism due to their perceived violent and physical nature (Coakley & Pike, 2014). However, in the safe and controlled environments that tournaments and their respective governing bodies and organizations aim to create, these sports can have a profound impact on youth development. But is this impact largely positive, generally negative, or does it produce mixed effects? How do combat sports–specifically, wrestling, jiu jitsu, and martial arts–affect young people's development? Those are the questions at the forefront of this article.

This literature review argues that combat sports offer an ideal environment for fostering young people's socioemotional and physical development, but is nonetheless careful to acknowledge potential downsides to the sport. The following section details the process of selection for the literature included in the subsequent analyses. The discussion portion of this article is then divided into sections that examine the advantages and disadvantages of combat sports upon youth development. After having introduced relevant academic scholarship representing both the pros and the cons, it then concludes with recommendations for helping ensure that the former outweighs the latter. The goal behind this line of research is to therefore offer actionable insights for all stakeholders—educators, parents, and young people—to better explore an avenue that could directly benefit their quality of life.

## Methods

This article employs a narrative-based interdisciplinary literature review to explore the multidimensional impacts of combat sports upon young people's physical and physiological development. The sources informing this support were drawn from peer-reviewed scholarly research in fields spanning sports medicine, developmental and educational psychology, pediatrics and family medicine, and public health. Sources also assumed the form of position statements from sports institutions and related governing bodies. Databases like PubMed, GoogleScholar, and PsycINFO were used to narrow the search specifically to combat sports and their relation to rapid weight loss (RWL) practices.

Studies were selected for inclusion based on perceived relevance. For inclusion, the study needed to focus on combat sports, specifically. While primary consideration was granted to studies addressing the implications of these sports for youth and adolescence, additional studies examining impacts in adult populations were also included to extrapolate applicable mechanisms

for younger athletes. The dataset is primarily composed of systematic reviews, longitudinal studies, and experimental research to favor empiricism over opinion. Publications that did not undergo peer review and popular media were excluded from the dataset.

Once the dataset was constituted, findings were organized into distinct themes. This integrated approach allowed for tracing conceptual links between combat sports structures and their ensuing impacts. Fully documenting these impacts then allowed for them to be framed within a broader discussion of youth development. Admittedly, while this approach allowed for focused discussion, it is susceptible to a few limitations, most notable among which includes collapsing various "combat sports" into one search category without differentiating for martial arts, boxing, wrestling, and other. An additional limitation pertained to the heavy representation of literature on RWL as opposed to other negative effects. Finally, excluding popular media may have also inadvertently excluded instructive case studies of high-profile athletes who were susceptible to the effects of combat sports.

## Combat Sports & Their Socioemotional and Developmental Benefits

Combat sports are, admittedly, largely individualistic, and thus not classified as a team sport. While that may the case, they have a significant impact on community building. In fact, many combat sports are praised for their inclusivity—inclusivity that stems from an ethos grounded in respect for others. This is the position that Lakes and Hoyt (2004) adopt when they assert that "The character training inherent in traditional martial arts teaches an individual to become more self-aware and to actively pursue character growth through the constant evaluation of thoughts and actions and subsequent adaptation of thoughts and actions for the better" (p. 283). Operating from the distinct frame of developmental psychology, the authors go on to contend that combat sports' emphasis on discipline and control have been shown to promote

self-regulation in young people. Such self-regulation is crucial for creating a space where others feel welcome, and where interpersonal conflict is less likely to result in physical intimidation or bullying behavior.

Bullying and other forms of interpersonal aggression have become an epidemic in the U.S., with estimates stating that approximately 1 in 5 children in grades 6-12 have reported being bullied (PACER Center, n.d.). Following the definition established by the U.S. Department of Health and Human Services (2025), "bullying" is characterized by three principles: "unwanted aggressive behavior," "observed or perceived power imbalance," "repetition or high likelihood of repetition of bullying behaviors." With such broadly established criteria, a wide variety of actions could constitute bullying, from spreading malicious rumors, to cyberbullying, to name-calling, to physical altercation. Given how many different forms bullying can assume, it may be difficult to recognize, and therefore equally as difficult to prevent. However, one of the primary abilities strengthened through combat sports is the ability to recognize when others are being hurt—that is in addition to the previously mentioned self-restraint and the skill to pursue methods of non-violent conflict resolution.

Another core value nurtured through participation in combat sports, which has a direct bearing on matters of inclusivity and community-building is humility. Humility is central to the practice of combat sports. As it is defined within the scholarship on psychological research, humility is not to be equated with low self-esteem or self-concept; instead, true humility is characterized by reflective self-assessment and questioning, general receptiveness to learning, and respect for others' abilities, no matter how different they may be (Tagney, 2000). These qualities are reinforced by combat sports through their instruction to acknowledge one's own deficits, internalize constructive feedback, and willingness to engage with more advanced

opponents. When compared to other competitive sports that reward dominance through "MVP" designations, for example, combat sports consistently require participants to grapple with the boundaries of their own limitations, which, in turn, fosters acute humility.

Such humility has been shown to serve as a protective factor against bullying. Social psychological research conducted by Exline and Geyer (2004), for instance, suggested that humility shared an inverse relationship with qualities like narcissism, perceived entitlement, and interpersonal dominance. These traits, on the other hand, are more highly correlated with bullying behavior, and therefore, one could argue that humility is likewise negatively associated with such aggressive acts. Exline and Geyer's findings were confirmed by later research by Wright et al., (2017) who empirically demonstrated that individuals who had higher humility scores on psychological surveys were less likely to engage in abusive or exploitative behavior and more prone to empathy and compassion.

As for which methods are most effective for combating bullying, the research on this matter has consistently shown that rule enforcement and punitive measures are rarely effective in deterring bullying behavior. What have been proven to effectively dissuade bullying, however, are programs targeting character formation. According to Espelage and Sweare (2010), curbing or preempting bullying altogether involves cultivating empathy, moral development, and a sense of accountability. Therefore, as combat sports make humility a cornerstone of their practice, they can be seen as functioning in a similarly protective way.

**Long-Term Gains**

What is more is that these values that combat sports has been shown to foster have lifelong effects that extend well beyond the formative years. For example, in their systematic review of 22 other empirical studies, Vertonghen and Theebom (2010) found that continued

participation in martial arts and combat sports was associated with long-term improvements in several domains, including self-control, social behavior, and moral aptitude. The authors furthermore noted that these effects upon one's character development extended beyond adolescence, well into adulthood.

Along these same lines, a study conducted by Lakes and Hoyt (2004) investigated the impact of a martial arts training program embedded within primary schools upon students' self-regulation, attention span, and emotional well-being in relation to the control group (i.e., their peers enrolled in a standard physical education program). The authors argue that the gains made during this crucial developmental period were likely to exert lasting impacts across the lifespan. These findings are further supported by direct reports from participants in combat sports programs. Theeboom et al. (2009) interviewed both adult combat sports participants as well as former youth participants. From these interviews, the authors learned that the values cultivated through combat sports training—such as perseverance amidst setbacks, respect for authority figures and peers, and self-regulation—went on to positively influence their interpersonal relationships and professional decision-making, even years after they had left their respective programs.

**Interpersonal Relationships & Psychological Well-Being**

This portion of the discussion now turns to consider in greater detail the two areas of one's life Theeboom et al. cite as benefitting from an individual's participation in combat sports exerts a positive effect on: the interpersonal relationships and the professional domain.

As alluded to above in the discussion on bullying, the competencies and skills cultivated through combat sports can benefit several other areas of one's life, primary among which are interpersonal relations. Research by Gross and John (2003), for example, noted that individuals

who possessed strong self-regulation skills were better able to manage interpersonal conflict and more likely sustain interpersonal relationships over the long-term. Such self-regulation, as Donelly and Young (1988) point out, is promoted in certain sports emphasizing regulated aggression. Stronger interpersonal relationships are moreover correlated with reports of higher overall happiness and are one of the best predictors of life satisfaction (Diener & Seligmen, 2002). In considering this body of research as a whole, combat sports could be said to have a positive influence on self-regulation, which works in the interest of improving interpersonal relationships, and such relationships greatly impact overall happiness.

**Academic & Professional Success**

If one has advanced interpersonal skills, they will likely succeed in academic and professional realms as well. In recent years, an abundance of research on educational and professional success has inquired into what psychologists refer to as "noncognitive skills," also more popularly known as "soft skills." Heckman et al. (2006) define noncognitive skills as separate from intellectual ability, and as instead referring to personality traits, motivations, and preferences that are valued in the labor market, in school, and in many other domains" (p. 411). In their research on which noncognitive skills serve as the greatest predictors of educational and professional success, the researchers identified self-control and persistence as playing a key role in positively shaping young people's academic and career outcomes.

These findings are supported by Baumeister et al. (2007), who determined a link between an individual's ability to self-regulate and the likelihood they would excel in grueling professional contexts. In their understanding of the term "self-regulation," the researchers operationalized the term as persisting in taxing tasks, resisting short-term indulgences in exchange for delayed gratification, and maintaining a high level of performance amidst stress

and exhaustion—all competencies that are necessary for achieving academic and professional excellence. With self-regulation and control being heavily emphasized in combat sports, as well as the ability to persevere despite setbacks and losses, these extracurricular activities may therefore exert an impact on young people's success that is comparable to curricular pathways.

In sum, the current body of research suggests that combat sports can positively influence several areas of a young person's life through deliberate value cultivation and skill development. By promoting humility, for instance, combat sports can have a protective effect against bullying and work in the interest of inclusion. They can also support the development of interpersonal skills as well as promote self-regulation competencies, both of which are generally retained well into adulthood, and are linked to improved educational and professional outcomes. Clearly, the benefits of combat sports are many, but they are only a boon to students' socioemotional development when the negative impacts of such sports are carefully acknowledged and mitigated. The following section is therefore dedicated to exploring

## Combats Sports & Their Adverse Effects

One of the most often-cited negative impacts of combat sports is both physiological and psychological in nature. This negative impact involves self-imposed dietary restrictions frequently perceived as necessary for competing in certain weight classes. The discussion that follows examines the detrimental physical effects of such measures geared towards bodily reconstitution. It then proceeds to consider the psycho-social entailments of these practices, considering the impact on young participants' psyche and self-image, as well as the implications for academic performance. The goal of this portion of the discussion is not to dissuade future participation in sports like wrestling, boxing, and martial arts, but to address the potential

hazards that often accompany these sports so that participation is characterized by informed consent.

**The Physiological Entailments of Rapid Weight Loss**

"Cutting weight" is an expression familiar to those immersed in the world of combat sports. "Cutting weight" is a process of intentional rapid weight loss (RWL) for the purposes of reducing body mass prior to competition to qualify for a lower weight category (Artioli et al., 2010, p. 175). In combat sports, weight classes are designed to promote the fairness of combat sports by allowing participants to compete against opponents who are comparable in size and weight. There are some combat sports, like Brazilian Jiu-Jitsu and Sumo wrestling, that have open weight classes, meaning that anyone of any size can compete against each other, but, by and large, most combat sports require one to compete in their specific weight class.

Despite the good intentions motivating the use of weight classes, this system has inadvertently encouraged weight cutting. Qualifying weigh-ins often take place only a few hours before a competition. Therefore, those athletes who are able to qualify for a lower weight category (and then regain the weight following the competition) are provided with a relative advantage over their opponent when it comes to size and strength. Research on this practice shows that many athletes involved in combat sports believe that failure to "make weight" is viewed as a loss of their competitive standing (Artioli et al., 2010; Reale et al., 2017). When it is equated with competitiveness in this way, cutting weight thus becomes not an extreme measure only undertaken by some, but a norm within combat sports circles.

Short-term weight loss, which is later regained, would be largely unproblematic, but reports from The Jackson Clinics highlight the dangers of RWL. One of the primary dangers of

RWL of this sort is that it is often achieved through intentional dehydration, which, in turn, strains the cardiovascular system, may damage the kidneys, and ultimately result in reduced cognitive activity (Stockton, 2025). Such an impact on physiological systems can be especially pronounced in regard to young athletes, who are in formative phases of development. Because of RWL's ability to interfere with this crucial time period, some researchers have issued concerns about the potential for stunted growth, as they cite a robust body of research indicated that severe malnutrition and dehydration can impair a child's physical development (National Institutes of Health, n.d.). According to the Healthy Children Organization, some of the long-term effects of rapid weight loss are "Reduced muscle strength, lower speed or less stamina in aerobic activities…Decreased cognitive performance, such as reaction time, problem solving, alertness, and accuracy…Changes in the body's immune response and cardiovascular, endocrine, gastrointestinal, renal, and thermoregulatory systems…Delayed physical maturation and impaired growth…Mood changes, depression, and the development of eating disorders." Further complicating matters is the fact that the effects of RWL interventions are long-lasting. In a statement drafted for the International Olympic Committee, Mountjoy et al. (2018) note that Relative Energy Deficiency in Sport (RED-S), characterized by low energy availability during adolescence may interfere with puberty, impede bone mineralization, and disrupt hormonal processes. The authors add that because peak bone mass and endocrine stability are achieved during youth, altering these processes may yield irreversible consequences.

RED-S has furthermore been connected to a greater propensity for injury. In the International Olympic Committee's consensus statement, researchers emphasize that low available energy stores impedes bone metabolism, anabolic hormone functioning, and muscle repair, all of which place the athlete at greater risk of injury (Mountjoy et al., 2018). The link

between low energy stores and reduced bone density frequently results in higher risk of fractures and delayed tissue healing, which are extremely consequential in high-impact combat sports that place extreme burden on joints and require musculoskeletal systems to bear the brunt of forceful collisions.

Dehydration brought on by RWL techniques may also further place the athlete at risk of injury, as it interferes with both neuromuscular coordination and cognitive processing (i.e., delayed reaction time). A study by Sawka et al. (2007) found that even partial dehydration can have a negative effect on balance, motor control, and moment-to-moment decision-making. Looking at combat sports, specifically, studies have demonstrated that dehydration may interfere with an athlete's ability to engage in defensive maneuvers (i.e., to avoid a blow), and in doing so, increase the likelihood of traumatic injuries, like concussions (Jetton et al., 2013; Reale et al., 2017). In this way, the RWL implicitly encouraged by existing combat sports competition structures may not only weaken the body's musculoskeletal systems, but also undermine cognitive functioning, both of which place the athlete in danger of injury.

**The Psychological Entailments of Rapid Weight Loss**

The injuries delivered by combat sports extend beyond the physical, however. As the connection between RWL practices common in combat sports and reduced cognitive functioning has already been established, one can anticipate the negative consequences such hold for academic performance. Reduced cognitive functioning may have a negative impact on attention span, working memory, and executive functioning, all of which are positioned within the field of educational psychology as foundational to academic success. Empirical studies by Adan (2012) and Benton and Burgess (2009) examining how even moderate dehydration can lead to concentration issues, reduced short-term memory activation and recall, and slower information

processing. The classroom-based competencies are essential for student success in the domains of reading comprehension, mathematics, and overall classroom engagement. Looking specifically at the competency of executive functioning, Best et al. (2011) studied a cohort of children aged 5-17 and found that executive functioning was strongly associated with academic achievement; it predicted student performance in math and reading, and reduced executive functioning was linked to an ability to persist with tasks and poorer academic outcomes. When one considers these findings in light of combat sports and its use of RWL techniques rooted in dehydration and calorie restrictions, the cognitive impairments that result may interfere with a student's ability to retain, respond to, and recall instructional material, ultimately leading to worse academic outcomes.

It is important to note that, as with other negative effects of combat sport participation, the consequences felt in the educational sphere are both all-encompassing and enduring. Research shows that acute cognitive disruptions may have a compounding and cumulative effect, even after the disruption itself has resolved. Blair and Raver (2015) argue that threats to a student's executive functioning (such as those in the form of dehydration and calorie deficit) are also associated with observed difficulty maintaining attention and regulating behavior, both of which impede academic advancement in the long run. On the topic of self-regulation in particular, Zimmerman contends that the self-regulatory capacities linked to higher executive functioning is critical to managing the demands of one's coursework and for overall academic success. Such scholarship therefore may offer evidence speaking to the mixed effects of combat sports when it comes to self-regulation and the benefits it conveys. While the earlier part of this discussion introduced evidence speaking to how combat sports fostered the development of

self-regulation through the cultivation of certain core values, reduced cognitive functioning caused by RWL strategies may harm a young person's ability to properly self-regulate.

**Body Image, Self-Esteem & Identity Formation**

Another significant psychological toll exacted by combat sports' attention to weight classification systems has to do with athletes' self-image. Research in sports psychology has demonstrated that sports that encourage athletes to constantly monitor their body weight are linked to higher rates of reported body dissatisfaction in adolescence and young adults (Hausenblas & Carron, 1999). This issue becomes particularly salient in sports that employ weight-class systems, as the nature of these systems encourage routine surveillance of body weight. Such systems and the focus on body weight as a metric of performance and by extension self-worth can, in turn, give rise to other conditions at the intersection of psychology and physiology, including eating disorders like anorexia nervosa and bulimia. This is perhaps why Sundgot-Borgen et al. (2004) discovered that the presence of eating disorders was higher in athletes than in the general population.

Additionally, the weight fluctuations that often accompany participation in combat sports may also impact bodily trust—in other words, the belief that one's body can reliably operate without forcible interventions or coercive control (Piran, 2016). Because research in developmental psychology positions adolescence as a critical period for identity formation and negotiations of self-esteem, constant scrutiny of one's bodily composition may provide the foundations for long-term negative perceptions of self (Harter, 2012). Low self-esteem and body image issues are moreover correlated with a host of other psychological conditions, including anxiety and depression (Paxton et al., 2006). What this means is that the psychological effects of

a prolonged attention to body composition can result in a wide array of psychological issues, many of which continue to exert their influence even long after participation in combat sports has concluded.

## Recommendations for Intervention

When taken together, the evidence presented in this literature review casts combat sports in an ambivalent light by cultivating some positive traits while also exposing young athletes to greater risks. Combat sports may foster discipline, self-regulation, and humility—skills that foster academic and professional success, promote interpersonal relationships, and facilitate overall happiness. Yet, weight-class systems adopted by the sport that encourage RWL may hurt athletes' physical health, cognitive functioning, and place them at higher risk for injuries, eating disorders, and distorted self-images. In this way, many of the risks and benefits of the sport contradict one another, inviting a clear discussion of how to promote said benefits while reducing their accompanying risks.

One method for tipping the scales in favor of promoting benefits has to do with regulatory reform, particularly for youth and adolescent participation in combat sports. The American Academy of Pediatrics has repeatedly warned of the dangers of drastic weight fluctuations and the long-term health consequences that can result. Oversight committees should therefore be established to enact and enforce stricter safeguards, such as weight-certification testing, limits on how often athletes can change weight classes, penalties for the use of unsafe weight-loss practices. While some of these protocols are currently in place within high school combat sports settings, their application remains inconsistent. Universal application and standardized enforcement are thus key to successful intervention.

Another recommendation geared towards helping the benefits of combat sports to outweigh the risks involves comprehensive education. Some athletes and parents may be implicitly aware of the risks that combat sports carry, but not fully know the long-term effects to physical development, cognitive functioning, and risk of injury. Fully disclosing these details prior to participation would work in the interest of informed consent and adopt a proactive rather than reactive approach.

Finally, coaches should serve as agents of change. Coaches have an influential role within combat sports culture in that they serve as authority figures, teachers, and value leaders. Coaching training and certification programs should likewise include an educational component detailing the risks of combat sports mentioned approach. They should also be provided for actionable avenues for intervention should they identify an at-risk athlete or observe other concerning behavior.

In outlining the mix of benefits and risks that combat sports offers, this article points to the need for such interventions as a way to retain the development strengths of the sport while preventing and mitigating harm. While combat sports have been shown to foster positive values linked to academic, professional, psycho-social success, these benefits can be overshadowed by competition structures that compromise physical health, cognitive capacity, and healthy identity formation and concept of self. In implementing these recommendations and grounding them in the evidence presented in this review, those involved in the sport will help ensure that it continues its longstanding history well into the future.

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