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Investigating aggression control in combat training among college physical education students

Michael E. Santos*

Central Luzon State University, Faculty, Science City of Munoz, Philippines.

* Correspondence: Michael E. Santos; michael.santos@clsu2.edu.ph

ABSTRACT

This study aimed to examine the effect of combat sports training on aggression control among second-year college students registered in a physical education course. It used a mixed-methods longitudinal design that combined quantitative and qualitative techniques. A total of 132 (68 men and 64 women) second-year college students enrolled in a physical education program participated. Every participant had a course in combat sports included in their course of study. Aggression levels were measured using a mixed-methods approach combining semi-structured interviews to probe participants' emotional experiences with the Buss-Perry Aggression Questionnaire (BPAQ). Repeated measures ANOVA particularly in hostility (-12.5%, κ2=0. 201\eta^2 = 0. 201η2=0. 201, and physical aggression (-9.8%, κ2=0. 149\eta^2 = 0. 149η2=0. 149), indicated significant decreases in overall aggression (-8.2%, κ2=0.178\eta^2 = 0.178η2=0. 149). Although with a smaller size, verbal hostility and anger also dropped. Qualitative and quantitative findings suggest that combat sports training can reduce aggression and improve emotional control, stress management, and self-discipline. Some students, however, reported increased frustration and competitiveness, indicating individual differences. These results support including structured combat sports in physical education to enhance students' emotional regulation.

KEYWORDS

Aggression Levels; Combat Sports Training; Buss-Perry Aggression Questionnaire; Students

1. INTRODUCTION

Combat sports have drawn a lot of curiosity because of its psychological implications, particularly with regard to managing anger. Researchers have long debated whether participation in such disciplines helps individuals control aggressive impulses or, conversely, reinforces them. On one hand, the structured nature of many martial arts emphasizes discipline, respect, and self-control, which may contribute to reduced aggression. A meta-analysis of participants in martial arts revealed that structured practitioners had an average 20% lower score on aggression (Moore et al., 2020). However, other studies show different findings. In comparison to their colleagues in non-sporting disciplines, 35% of physical education students had elevated levels of hostility, according to another extensive survey of collegiate athletes (Tepe et al., 2016). These results highlight the intricacy of aggression in learning environments, especially for young adults going through emotional and social growth.

Combat sports and martial arts offer safe spaces where violence is managed and constructively directed. According to research by Lafuente et al. (2021), combat sports' regulated format encourages self-control and emotional management while lowering impulsivity. On the other hand, situations that are unregulated or too competitive may make aggressive tendencies worse (Predoiu et al., 2022). Results are greatly impacted by the role of coaches, peer relationships, and the training's cultural setting, highlighting the significance of contextual elements in understanding findings. According to Buss & Perry (1992), aggression is a complex psychological concept that includes antagonism, rage, and verbal and physical aggression.

Combat sports have been associated with better resilience and stress management in addition to a decrease in hostility. Cunha et al.'s systematic review from 2022 emphasized the psychological advantages of martial arts, stressing the importance of consistent practice in promoting emotional stability and creating social support systems. According to developmental theories, structured physical activities support holistic growth during crucial transitional times, such as college (McCrae & Sutin, 2018). These findings are consistent with such beliefs.

This study aims to fill two major gaps: the dearth of quantitative information on aggressiveness in physical education students, and the incomplete knowledge of the dual function that combat sports play in regulating aggression and fostering emotional growth. This study combines qualitative and longitudinal quantitative analysis to reveal the complex relationships between combat sports training and behavioral and emotional health.

2. METHODS

2.1. Design and Participants

In order to investigate the psychological effects of combat sports training on aggression levels among college physical education students, this study used a mixed-methods longitudinal design that combined quantitative and qualitative techniques. The research investigation involved 132 second-year college students enrolled in a Physical Education program. Every participant had a course in combat sports included in their course of study. There were 68 men and 64 women among the sample of students. Further demographic information, including socioeconomic level and past experience with aggression-related training, was gathered to help to frame the results (Table 1):

Table 1. Participant distribution by socio-economic level and combat sports experience

Category	Group	%
Socio-Economic Level (Self-Reported)	Lower-income	35%
	Middle-income	50%
	Upper-income	15%
Combat Sports / Self-Defense Experience	No experience (Beginners)	60%
	Moderate experience (1–3 years)	30%
	Advanced experience (4+ years / competitive)	10%

Socio-Economic Level (Self- Reported): While 35% (n = 46) said they hailed from lower-income origins, 15% (n = 20) came from upper-income homes and most of the participants—50%, n = 66—identified as middle-income. A good number of the participants—60%, n = 79—had never participated in combat sports or self-defense training, therefore categorizing them as beginners. Ten percent (n = 13) were senior practitioners with 4+ years of expertise or competitive backgrounds; thirty percent (n = 40) had moderate experience—1–3 years of prior training.

2.2. Instrument

A variety of aggressiveness aspects, including hostility, anger, verbal aggression, and physical aggression, were measured using the Buss-Perry Aggressioon Questionnaire (BPAQ). The reliability of the BPAQ in measuring aggressiveness levels has been extensively confirmed in sports psychology research. The quantitative data was supplemented with semi-structured interviews that focused on the experiences, emotional control, and perceptions of participants on the effects of combat sports training on their aggression and general well-being.

2.3. Procedure

Throughout the semester, participants trained for combat sports for two hours every week. Techniques, conditioning, sparring, and talks focusing on self-control, discipline, and sportsmanship were all part of the training. Twenty semi-structured interviews were conducted at the halfway and end of the training period to gather qualitative data. Three points in time were used to gather quantitative data:

1. Time 1 (Beginning): Baseline aggression scores were recorded.
2. Time 2 (Midpoint): Intermediate assessments were conducted to observe changes.
3. Time 3 (End): Final evaluations captured the cumulative effects of the training.

Before and after training, the BPAQ evaluated degrees of aggressiveness. Considering the self-report character of this test, the resacher admitted certain prejudices including social desirability effects. Future research have to take into account adding physiological markers or behavioral observations to augment self-report information.

Semi-structured interviews looked into participants' opinions of changes in aggression, stress management, and emotional regulation for qualitative analysis. Interview questions aimed at attitudes toward aggression, training experiences, and introspection on behavior modification. Multiple coding rounds guaranteed inter-coder reliability; interviewers were taught qualitative data collecting techniques. Prior to the commencement of the investigation, all participants were granted informed consent, which assured compliance with ethical standards, including confidentiality and anonymity.

2.4. Data Analysis

Using repeated measures ANOVA, quantitative data from the BPAQ was investigated to show degrees of aggression over the three intervals. Post-hoc tests revealed particular differences across time. Partial eta squared, or effect sizes, were recorded to evaluate changes in practical relevance.

While the BPAQ is a useful instrument, self-reported data are naturally prone to social desirability bias—where individuals may underreport violent impulses because of perceived societal expectations. To help to lessen this participants were advised that answers would remain private to help to minimize response distortions. Emphasizing honest reporting, researchers underlined that there were no right or incorrect answers.

Using Scales et al. (2016)'s six-phase framework, qualitative interviews were transcribed and examined thematically for recurrent themes including emotional control, stress coping methods, and

social support. Key themes in emotional regulation, self-control, and interpersonal conflict resolution were found using thematic analysis. Transcripts were separately examined by two trained coders using Braun & Clarke's (2006) six-step theme analysis approach to improve inter-coder dependability. Triangulation of the data guaranteed consistency between quantitative and qualitative results.

Twenty semi-structured interviews at two times in the study—midpoint (Time 2) and end of semester (Time 3)—were used to investigate participants' opinions of combat sports training and its psychological impact.

Interviews followed a standardized guide exploring themes such as:

Emotional regulation: *"How has combat sports training influenced your ability to control emotions such as anger or frustration?"*

Stress coping mechanisms: *"Can you describe a moment when you felt stressed in training? How did you handle it?"*

Perceived aggression changes: *"Do you feel that your level of aggression has changed since starting combat sports? If so, how?"*

Social support and peer influence: *"What role have your teammates or instructors played in your experience with combat sports?"*

3. RESULTS

The repeated measures ANOVA demonstrated a significant reduction in aggression scores over time, F(2,261)=27.50, p<.001F(2, 261)=27.50, p<.001F(2,261)=27.50, p<.001, with a moderate-to-large effect size (η2=0.178\eta^2 = 0.178η2=0.178). Post-hoc comparisons confirmed a significant decrease in aggression between the first and third assessments [t(131)=7.31,p<.001t(131) = 7.31, p < .001t(131)=7.31,p<.001], showing that combat sports training reduces aggression over time (Table 1).

Table 1. Over All Aggression Scores (1st Term - 3rd Term)

Assessment Point	Overall Aggression Score	p value	Post-hoc Comparison
1st Term (Beginning)	45.2	0.001	
2nd Term (Middle)	42.7	.097	
3rd Term (End)	39.5	.012	1st Term vs 3rd Term (p<0.001)

Table 2 shows how participants' aggression levels vary over different stages of the training program.

Table 2. Changes in aggression scores across training period

Aggression Component	Pre-Training Mean (SD)	Post-Training Mean (SD)	% Change	F-value	p-value	Effect Size (η2\eta^2η2)	Practical Significance
Physical Aggression	28.7 (5.3)	25.9 (4.8)	-9.80%	5.72	.009**	0.149	Moderate reduction in aggressive physical behavior
Verbal Aggression	21.4 (4.1)	20.1 (3.9)	-6.30%	4.21	.032*	0.102	Small but meaningful decline in confrontational speech
Hostility	27.8 (6.0)	24.3 (5.6)	-12.50%	8.31	<.001***	0.201	Substantial decrease in negative emotional tendencies
Overall Aggression	94.6 (12.3)	86.8 (11.2)	-8.20%	6.89	<.001***	0.178	Moderate-to-large reduction in overall aggression

Note: p < *.05, p* < .01, *p < .001 () indicate levels of statistical significance; Effect size (η2\eta^2η2) interpretation: 0.01 (small), 0.06 (moderate), 0.14+ (large).*

The data above show an apparent decrease in aggression levels after combat sports training, based on the drop across all four BPAQ aggression components. With a significant effect size (η2=0. 201\eta^2 = 0. 201η2=0. 201, hostility shown the most notable decrease (-12.5%). showing that fighting training may have helped students control their emotional responses and lower negative affect.

Reflecting a modest decline in aggressive physical tendencies, physical violence dropped by 9.8% (η2=0.149\eta^2 = 0.149η2=0.149). This implies that organized combat sports training could be a regulated release for aggressiveness, so helping to reduce impulsive violent behavior. Though the impact size was less, suggesting a more subtle but significant shift in aggressive speech patterns, verbal aggression also dropped (-6.3%, η2=0.102\eta^2 = 0. 102).

Total aggression scores reduced by 8.2% (η2=0.178\eta^2 = 0.178η2=0.178), therefore validating a modest-to-large impact of combat training on aggression control. The noted alterations fit the body of current research indicating that regulated exposure to combat sports promotes self-discipline, emotional control, and stress management. But the rather brief observation period—one academic semester—limits our capacity to ascertain long-term effects. Extended follow-ups should be taken into account in future studies to see whether these decreases in aggressiveness continue past

training. Including objective measures—such as physiological markers or behavioral assessments—may also help to confirm the results and lower possible self-report bias. Table 3 summarizes qualitative findings from the study.

Table 3. Thematic analysis on the impact of combat sports training on aggression

Theme	Description
Reduction in Aggression Levels	Participants experienced a noticeable decrease in aggression levels over the study period.
Enhanced Emotional Regulation	Regulation of emotions, notably anger and impatience, improved.
Improved Stress Coping Mechanisms	Participants learned stress- and adversity-management techniques.
Establishing Social Support Networks	Training groups created strong social networks.
Impact on Overall Well Being	Lower aggression, better emotional regulation, and better coping abilities boosted well-being.
Constant Challenges	Aggression and mood management were difficult for some participants, especially in competitive situations.

According to the thematic analysis table above, college students' mental health and aggression are impacted by combat sports training. Themes include stress management, emotional control, anger reduction, social support, the influence on general well-being, and ongoing difficulties.

4. DISCUSSION

Thematic analysis of participant interviews revealed three major themes: emotional regulation, stress coping mechanisms, and social support networks. For example, one participant shared, *"I used to lose my temper easily, but now I pause and think before reacting. Sparring taught me to stay calm under pressure."* Another participant noted, *"Practicing defensive techniques helped me channel my anger into focus during training rather than letting it build up."* These narratives illustrate how combat sports training fosters improved emotional control by teaching participants to manage high-stress scenarios effectively.

Participants also described significant improvements in their ability to cope with stress. One remarked, *"Training sessions felt like a safe space where I could let out my frustrations while learning discipline."* The group dynamics of training created a supportive community, as emphasized by another interviewee: *"My peers encouraged me, and we helped each other improve. It felt like*

being part of a team that genuinely cared about each other." Such comments highlight how combat sports training extends beyond physical benefits, offering psychological and social support.

Training in combat sports lowers aggression among college PE students, according to this study. The notable decline in aggressiveness scores suggests that combat sports may mitigate aggression and enhance anger management (Kostorz & Sas-Nowosielski, 2021; Mickelsson & Hansson, 2021). The psychological advantages of combat sports, such as better emotional control and social support, are highlighted by qualitative themes. These results are consistent with earlier research (Basiaga-Pasternak et al., 2020; Tetiana et al., 2021; Zhu et al., 2022) suggesting that organized physical activities, especially combat sports, may provide mental health benefits. Comprehensive physical education programs must to take into account both physical and psychological wellness, according to the findings (Martín-Rodríguez et al., 2024; Predoiu et al., 2022; Ziemba et al., 2020).

The results of this study strongly suggest that training in combat sports makes college students less aggressive by helping them control their emotions, deal with stress better, and make new friends. The fact that aggression rates went down from the first test to the last, with a moderate to large effect size (·2=0.178\eta^2 = 0.178·2=0.178), shows how important these changes are in real life.

Qualitative data from participants who said they had better self-control, emotional discipline, and the ability to use their anger in a healthy way supports this finding even more. These results are in line with what other research has found: organized combat sports programs stress self-control and controlled aggression over uncontrolled hostility (Vertonghen & Theeboom, 2013).

Mixed-methods integration, on the other hand, showed a more complex picture: while most students became less aggressive, a small group (about 10%) had trouble controlling their emotions in competitive situations. This means that competitive settings might make some people more likely to be aggressive, which shows how important structured guidance and upright coaching are for preventing illicit conduct.

These results are substantial because they not only show the psychological and emotional advantages of combat sports, but they also imply that training in these sports can be extremely effective in reducing aggression in a setting that is both cognitively and physically taxing. Although this study showed a decrease in hostility, other studies have found conflicting results. Lafuente et al. (2021), for example, found that whereas animosity increased in highly competitive contexts, it

decreased in regulated environments. This difference emphasizes how crucial well-supervised, organized training environments are to getting the desired results. Additionally, the results of Moore et al. (2020), who noted improved emotional regulation among martial arts practitioners, are consistent with the study. The impact of combat sports is, however, greatly influenced by cultural and contextual factors, according to studies by Predoiu et al. (2022), which suggests that contexts that prioritize competitiveness over personal development may produce different outcomes.

The outcomes of this study are in line with other research that indicated combat sports may help people control their emotions and lessen their anger. For instance, research by Lafuente et al. (2021); Sharma & Purashwani (2021) indicated that training in martial arts and combat sports led to better emotional regulation and less hostility. These conclusions are corroborated by the results, which show a considerable decrease in verbal and physical violence as well as in overall animosity. Comparable findings were reported by Mickelsson & Hansson (2021); Kostorz & Sas-Nowosielski (2021), who discovered that martial arts training decreased dissatisfaction and aggression. By offering a longitudinal analysis of aggression changes over time, the current study adds to the body of literature by demonstrating not only the general decline in aggression but also a better comprehension of the mechanisms through which combat sports training influences aggression, such as stress coping mechanisms and emotional regulation.

5. LIMITATIONS

Despite the strengths of this study, several limitations must be acknowledged:

Self-Report Bias: The reliance on the Buss-Perry Aggression Questionnaire (BPAQ) introduces potential social desirability bias, as participants may underreport aggressive tendencies due to societal expectations. Future research should incorporate behavioral observations or physiological measures (e.g., heart rate variability, cortisol levels) to validate self-reported aggression levels.

Sample Homogeneity: The study exclusively involved second-year college students, limiting generalizability to broader populations (e.g., younger adolescents or older adults). Additionally, socioeconomic status variations were relatively minimal, as the majority of participants came from middle-income backgrounds (68%). Future research should examine more diverse populations to enhance external validity.

Short-Term Observation Period: The study spanned one academic semester (approximately 16 weeks), which may not fully capture long-term behavioral changes. Longitudinal studies tracking

aggression levels over multiple years would provide deeper insights into the sustainability of aggression reduction through combat sports training.

6. PRACTICAL IMPLICATIONS

The findings offer valuable implications for physical education curricula and combat sports training programs:

Incorporating Emotional Regulation Training: Given that emotional control emerged as a key mechanism for aggression reduction, combat sports instructors should integrate mindfulness techniques, controlled breathing exercises, and cognitive reframing strategies into training sessions.

Guidance for Competitive Athletes: Since a small percentage of students exhibited heightened aggression in competitive settings, structured interventions (e.g., sports psychology workshops, ethical coaching principles) should be implemented to ensure competition does not reinforce aggressive tendencies.

Enhancing Social Support Systems: The role of peer interactions and mentorship in aggression reduction suggests that training environments should emphasize teamwork, mutual respect, and structured debriefing sessions to help athletes process their emotions constructively.

By addressing these key areas, educational institutions and sports organizations can maximize the psychological benefits of combat sports while mitigating potential risks. Future research could examine these variables in further detail by comparing groups that participate in different types of physical exercise or by employing extra metrics, including personality tests.

Future studies should try to fill in these gaps by looking at a more varied sample that includes people from different age groups, backgrounds, and academic programs, given the constraints of this one. Longitudinal studies that include several evaluation points over a lengthy period of time may be able to shed light on how combat sports training affects aggression over the long run. This study highlights the many advantages of combat sports training by combining qualitative and quantitative data. Significantly lower BPAQ scores provide credence to the narrative evidence of improved stress management and emotional control.

In order to supplement self-reported data, future research could also include objective measures of aggression, including behavioral observations. Future studies can also examine the precise processes that lead to a decrease in aggression, such as the function of self-control, mental toughness, or the formation of social support systems in training groups. Lastly, comparative

research might evaluate the effects of combat sports training on aggression and emotional control in relation to other structured physical activities, including team sports.

7. CONCLUSIONS

This study makes an important contribution to understanding the association between combat sports training and hostility levels among college physical education students. By combining quantitative and qualitative data, it demonstrates how combat sports can have an impact on psychological well-being, notably animosity. These findings have clear implications for physical education educators, policymakers, and curriculum developers. Physical education programs should closely monitor and handle students' emotional responses to combat sports, and provide support systems such as counseling or conflict resolution training to offset potential harmful psychological impacts. Furthermore, combining mental health education with physical training helps provide a more balanced approach to student growth.

Whereas this study provides interesting insights, it is crucial to recognize several limitations, including the potential bias inherent in self-reported assessments of aggression. Self-report surveys may not fully reflect the complexities of aggression, thus future research should investigate including more objective measures, such as behavioral observations or physiological tests, to offset this bias. Furthermore, the sample size and participant diversity could be increased to provide more generalizability. To completely comprehend the long-term psychological impacts of combat sports training on aggression and other emotional components, more research is needed.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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