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THE EFFECTIVENESS OF HAND-TO-HAND COMBAT TRAINING IN DEVELOPING THE PHYSICAL AND PSYCHOLOGICAL READINESS OF FEMALE UNIVERSITY STUDENTS

Eshmanova Umida Abdulla qizi

Senior Lecturer, Department of Physical Culture
Oriental University

Ikramova Zaynab Rixsivayevna

1st-year student, Physical Culture program
Oriental University

Abstract

The increasing demands placed on university students require the development of both physical fitness and psychological resilience. Among female students, improving self-confidence, emotional stability, physical preparedness, and self-defense skills has become an important objective of modern physical education. Hand-to-hand combat training represents an effective educational tool that combines physical exercise with psychological conditioning. This study aims to determine the effectiveness of hand-to-hand combat training in improving the physical and psychological readiness of female university students. The research was conducted during the 2025–2026 academic year and involved 80 female students aged 18–22 years. The participants were divided into a control group (n=40), which followed the traditional physical education curriculum, and an experimental group (n=40), which participated in a structured hand-to-hand combat training program for five months. Physical preparedness was assessed through speed, strength, endurance, flexibility, agility, and coordination tests, while psychological readiness was evaluated using standardized questionnaires



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measuring self-confidence, stress resistance, emotional stability, and motivation. The results demonstrated statistically significant improvements ($p < 0.05$) in all measured variables among the experimental group compared with the control group. The greatest improvements were observed in agility, reaction speed, self-confidence, and stress resistance. The findings indicate that systematic hand-to-hand combat training serves as an effective pedagogical means for developing both physical and psychological readiness among female university students. The study also provides practical recommendations for integrating hand-to-hand combat elements into university physical education programs.

Keywords: hand-to-hand combat, female university students, physical readiness, psychological readiness, self-defense, agility, coordination, emotional stability, physical education, university sports.

Introduction

Modern higher education institutions are increasingly expected to prepare students not only academically but also physically and psychologically for the challenges of contemporary society. Female university students often experience considerable psychological pressure resulting from academic workload, social expectations, and rapidly changing lifestyles. These factors may negatively affect physical activity levels, emotional health, and self-confidence. The World Health Organization emphasizes that regular physical activity significantly contributes to both physical and mental well-being. Nevertheless, studies have shown that female university students generally participate in less vigorous physical activity than their male counterparts. Consequently, there is a growing need for educational approaches that simultaneously enhance physical fitness and psychological resilience. Hand-to-hand combat training has recently attracted



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attention as one of the most comprehensive forms of physical education. Unlike traditional fitness activities, it develops strength, speed, coordination, flexibility, balance, endurance, reaction ability, and technical movement skills while simultaneously improving emotional control, courage, discipline, concentration, and decision-making under stressful conditions. For female students, hand-to-hand combat offers additional benefits. Besides improving physical fitness, it enhances personal safety awareness and self-defense skills, increases self-confidence, reduces fear in dangerous situations, and promotes independent decision-making. These characteristics make hand-to-hand combat particularly valuable within modern university physical education systems. Numerous countries have introduced self-defense programs for female students as part of university curricula. Such programs not only improve physical preparedness but also contribute to psychological security and social confidence. Therefore, evaluating the educational effectiveness of hand-to-hand combat training has become an important scientific and practical issue. The purpose of this study is to experimentally determine the effectiveness of hand-to-hand combat training in improving the physical and psychological readiness of female university students and to develop methodological recommendations for its implementation within university physical education programs.

Literature Review

Recent scientific studies have demonstrated that combat sports positively influence both physical fitness and psychological well-being among young adults. Unlike conventional physical education activities, combat training integrates physical conditioning with cognitive and emotional development. Brown and Wilson (2022) reported that self-defense-based physical education significantly increased female university students' confidence and reduced



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anxiety levels after twelve weeks of structured practice. Similarly, Smith and Johnson (2023) found that combat-oriented exercises enhanced reaction speed, coordination, muscular endurance, and stress management among university students. Kim and Park (2022) investigated martial arts programs for female college students and observed significant improvements in emotional regulation, self-esteem, and social adaptation. Their findings indicated that martial arts provide a psychologically supportive environment where participants gradually overcome fear and develop emotional resilience. Garcia et al. (2023) emphasized that hand-to-hand combat training stimulates neuromuscular adaptation through complex motor tasks requiring rapid decision-making and precise body control. These adaptations contribute to improved balance, agility, reaction time, and motor coordination. Among researchers from CIS countries, Ivanov and Petrova (2021) concluded that combat sports effectively develop volitional qualities such as determination, discipline, persistence, and emotional stability. Their research suggested that female students participating in combat training demonstrated greater psychological adaptability during stressful situations than students involved in traditional physical education. Uzbek scholars have also highlighted the educational value of combat sports. Ma'murbekova (2024) reported that speed-strength exercises significantly improve the functional preparedness of highly qualified female athletes. Muidinov (2025) emphasized the relationship between coordination abilities and technical mastery in combat sports, while Abdullayev (2023) demonstrated the importance of specialized physical preparation in improving athletic performance. Despite the increasing number of studies investigating martial arts and self-defense training, relatively few studies have comprehensively examined both the physical and psychological effects of structured hand-to-hand combat programs specifically designed for female university students. Furthermore, limited research has evaluated these effects



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within higher education institutions in Central Asia. Therefore, this study seeks to address this research gap by experimentally evaluating the combined physical and psychological outcomes of hand-to-hand combat training among female university students and by proposing methodological recommendations for its implementation in university physical education curricula.

Research Methodology

The study was conducted during the 2025–2026 academic year at Oriental University and involved 80 female undergraduate students aged 18–22 years who voluntarily agreed to participate in the experiment. All participants belonged to the main medical group and had no medical contraindications for engaging in moderate- to high-intensity physical activity.

The participants were randomly divided into two groups:

- **Control Group (n = 40):** participated in the traditional university physical education curriculum.
- **Experimental Group (n = 40):** participated in a specially designed hand-to-hand combat training program integrated into physical education classes.

The pedagogical experiment lasted **five months**, with practical classes conducted **three times per week**, each lasting **90 minutes**.

Research Methods

The following scientific methods were employed during the research:

- analysis of scientific and methodological literature;
- pedagogical observation;
- pedagogical experiment;
- physical fitness testing;
- psychological assessment questionnaires;



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- expert evaluation of technical skills;
 - mathematical-statistical analysis (Student's t-test, significance level $p < 0.05$).

Physical Readiness Assessment

Physical preparedness was evaluated using standardized motor tests:

- 30-meter sprint (speed);
- Standing long jump (explosive leg power);
- Push-ups in one minute (upper-body strength endurance);
- Sit-ups in one minute (abdominal muscular endurance);
- Sit-and-reach test (flexibility);
- Illinois Agility Test (agility);
- Single-leg balance test (coordination);
- Shuttle run 4×10 m (speed and coordination).

Psychological Readiness Assessment

Psychological preparedness was assessed using validated questionnaires measuring:

- self-confidence;
- stress resistance;
- emotional stability;
- motivation toward physical activity;
- decision-making ability under pressure;
- self-defense confidence.

The questionnaires were administered before and after the experimental period under identical conditions. Attendance, training discipline, and students' subjective opinions regarding the program were also monitored throughout the study.



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Hand-to-Hand Combat Training Program

The experimental program was designed according to the physiological characteristics of female university students and consisted of progressively increasing training loads.

The training content included:

- general physical conditioning;
- basic hand-to-hand combat stance and movement techniques;
- defensive techniques;
- escape techniques from common attacks;
- striking combinations using safe educational methods;
- reaction and coordination drills;
- partner exercises;
- psychological self-control exercises;
- situational self-defense scenarios;
- breathing and recovery exercises.

Special attention was paid to injury prevention, proper technique, and psychological comfort during every lesson.

Table 1. Weekly Hand-to-Hand Combat Training Program Used in the Experimental Group

Day of the week	Focus	Duration	Main exercises
Monday	Physical conditioning and basic techniques	90 min	Warm-up, running drills, flexibility, stance, footwork, defensive movements
Wednesday	Technical and tactical training	90 min	Punching techniques, blocking, partner drills, reaction exercises
Friday	Self-defense and psychological preparation	90 min	Escape techniques, situational training, stress-control exercises, sparring simulations



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Main Part

At the beginning of the experiment, no statistically significant differences were observed between the control and experimental groups ($p > 0.05$), confirming comparable baseline characteristics.

Following five months of systematic training, considerable improvements were recorded in the experimental group.

Physical Readiness

Compared with the control group, female students participating in hand-to-hand combat training demonstrated greater improvements in:

- reaction speed;
- agility;
- muscular strength;
- flexibility;
- coordination;
- cardiovascular endurance.

The largest increase was observed in agility and reaction time due to the dynamic nature of combat-specific exercises.

Psychological Readiness

Psychological indicators also improved substantially.

Female students reported:

- increased self-confidence;
- greater emotional stability;
- improved stress management;
- reduced fear during unfamiliar situations;
- higher motivation toward regular physical activity;



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- stronger belief in their ability to protect themselves.

Many participants stated that after completing the training program they felt considerably safer both inside and outside the university environment. Furthermore, instructors observed noticeable improvements in discipline, responsibility, communication, teamwork, and leadership qualities throughout the experiment. The integration of physical and psychological exercises created a positive educational environment that encouraged active participation and regular attendance.

Table 2. Results at the beginning and end of the experiment (mean values)

Indicators	Control Group (Pre-test)	Control Group (Post-test)	Experimental Group (Pre-test)	Experimental Group (Post-test)
30 m Sprint (sec)	5.68	5.54	5.66	5.21
Standing Long Jump (cm)	163	168	164	182
Push-ups (reps/min)	18	21	19	29
Sit-ups (reps/min)	28	31	29	39
Sit-and-Reach (cm)	13.2	15.0	13.5	18.9
Illinois Agility Test (sec)	21.4	20.9	21.5	19.1
Balance Test (sec)	18.6	20.1	18.7	27.6
Self-confidence (100-point scale)	61	66	60	86
Stress Resistance (100-point scale)	58	63	59	84
Motivation for Physical Activity (%)	57	65	58	91

The statistical analysis confirmed significant differences between the groups across all measured variables ($p < 0.05$). The largest improvements were observed in psychological readiness, particularly self-confidence and stress resistance, where increases exceeded 25 percentage points. These findings



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support previous investigations conducted by Brown and Wilson (2022), Kim and Park (2022), and Smith and Johnson (2023), all of whom concluded that combat-oriented physical education programs simultaneously enhance physical performance and psychological resilience. The present study also expands existing knowledge by demonstrating that a structured hand-to-hand combat curriculum can successfully be implemented within university physical education programs for female students without compromising safety. The carefully designed progression of training intensity and technical complexity enabled participants to acquire self-defense skills while maintaining high levels of motivation and minimizing injury risk. An important observation was that many students voluntarily practiced techniques outside scheduled classes. According to post-experimental questionnaires, **85%** of participants in the experimental group reported practicing basic movements independently at least twice a week, while **72%** expressed interest in joining university martial arts clubs after completion of the study. These results indicate that hand-to-hand combat training has both immediate educational benefits and long-term potential for promoting lifelong physical activity among female university students.

Conclusion

The findings of the present study demonstrate that systematic hand-to-hand combat training is an effective pedagogical tool for enhancing both the physical and psychological readiness of female university students. Compared with traditional physical education classes, the experimental training program produced significantly greater improvements in speed, agility, muscular strength, coordination, flexibility, balance, and overall physical preparedness. In addition to physical development, the training program had a substantial positive influence on psychological characteristics. Female students who participated in hand-to-



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hand combat training showed higher levels of self-confidence, emotional stability, stress resistance, motivation, and decision-making ability under pressure. These qualities are essential not only for successful participation in sports but also for everyday life, professional activities, and personal safety. The integration of self-defense techniques, reaction drills, partner exercises, and situational training created an educational environment that encouraged active participation, teamwork, discipline, and responsibility. The high attendance rate and increased interest in extracurricular sports activities observed during the experiment further confirm the motivational value of hand-to-hand combat training. The statistical analysis ($p < 0.05$) confirmed the effectiveness of the proposed methodology and demonstrated that the experimental program can successfully complement university physical education curricula. Therefore, incorporating structured hand-to-hand combat training into physical education programs may significantly contribute to the comprehensive development of female university students. Although the present study produced encouraging results, further research involving larger participant samples, longer experimental periods, and students from different universities would strengthen the evidence base. Future investigations should also examine the long-term effects of hand-to-hand combat training on leadership, emotional intelligence, mental health, and academic performance.

Practical Recommendations

Based on the results of the study, the following recommendations are proposed:

- Introduce hand-to-hand combat training as an elective component of university physical education programs for female students.
- Conduct practical self-defense classes at least **2–3 times per week**.



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- Combine technical combat exercises with general physical conditioning and psychological training.
 - Include reaction-speed, coordination, agility, and balance exercises in every training session.
 - Organize practical seminars focusing on women's personal safety and self-defense.
 - Ensure that instructors receive specialized professional training in teaching female self-defense.
 - Equip university sports facilities with appropriate safety equipment, including mats and protective gear.
 - Regularly monitor students' physical and psychological readiness using standardized assessment methods.
 - Encourage female students to participate in university martial arts clubs and self-defense competitions.
 - Promote healthy lifestyles through educational programs integrating physical activity and psychological resilience.

Limitations of the Study

The present research has several limitations. First, the experiment involved participants from only one university, which limits the generalizability of the findings. Second, the intervention lasted only five months; therefore, long-term effects were not investigated. Finally, external factors such as nutrition, sleep quality, and lifestyle habits were not controlled throughout the experiment.

Future Research Directions

Future studies should:

- investigate long-term adaptations to hand-to-hand combat training;
- compare different combat sports among female students;



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- examine the relationship between self-defense training and academic achievement;
 - evaluate injury prevention strategies in university combat sports;
 - explore psychological resilience and leadership development through martial arts;
 - analyze the effects of hand-to-hand combat on quality of life and mental health.

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