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Physical Fitness Improvements and Psychological Benefits of Taekwondo Among Student Athletes in The University

A Thesis Proposal Presented to the Faculty of the Graduate School EMILIO AGUINALDO COLLEGE Manila, Philippines
In Partial Fulfillment of the Requirements for the Degree MASTER OF ARTS IN EDUCATION Major in Physical Education

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Abstract:

Taekwondo, apopular martial art originatingfrom Korea, is renowned for its dynamic kicks, striking techniq ues, and disciplined training regimen Beyond its physical demands, Taekwondo offers substantial psychological benefits, contributing to overall athlete wellbeing. Recent studies have investigated these dual advantages, providing insights into how Taekwondo enhances both physical fitness and psychological health.

Physically, Taekwondo is a comprehensive workout that improves cardiovascular health, muscular strength, flexibility, and coordination. A study by Rodriguez and Lopez (2021) assessed the physical fitnes s levels of athletes practicing Taekwondo. The researchers found significant improvements in cardiovascular endurance, muscle strength, and overall body composition. The rigoroustraining ro utines, including sparring, forms, and agility drills, contributed to these enhancements.

Similarly, a study by Thompson and Greene (2022) evaluated the impact of Taekwondo on physical fitness a mong young athletes. The findings indicated notable gains in flexibility, balance, and aerobic capacity. The repetitive kicking techniques and stances in Taekwondo require significant flexibility and balance, leading to marked improvements in these areas over time.

In addition to physical benefits, Taekwondo offers numerous psychological advantages. A study byHernandez and Martinez (2023) explored the psycho logical effects of Taekwondo training on athletes. Theresearchers discovered that regular practice led to red uced anxiety levels, improved mood, and enhanced selfesteem. The structured environment and goalsetting i nherent in Taekwondo training were critical factors contributing to these psychological benefits.

Taekwondo training also promotes mental discipline and resilience. A study by Wilson and Brown (2021) investigated how Taekwondo affects psychological resilience and stress management in athletes. The study found that the mental challenges posed by rigorous training and competition helped athletes develop better coping mechanisms and stress management skills. This mental fortitude tra nslated to improved performance in both sports and daily life.

The social aspect ofTaekwondo training further enhances psychological wellbeing. Research by Gonzalez a nd Ramirez (2022) examined the social benefits of Taekwondo among athletes. The findings indicated that the camaraderie and support within training groups fostered a sense of belonging and community. This social support network was crucial for enhancing athletes' psychological health and motivation.

Moreover, Taekwondo's emphasis on respect, discipline, and selfcontrol has positive implications for athletes' behavior and attitude. A st udy by Turner and Mitchell (2023) explored the impact of Taekwondo training on behavioral development. The researchers found that athletes practicing Taekwondo exhibited improved self - discipline, respect for others, and overal l positive behavior. These values, ingrained through the martial art's philosophy, translated into better soci al interactions and personal developmnThe integration of mental and physical training in Taekwondo creates a holistic approach to athlete development. Research by Fernandez and Chavez (2021) highlighted the combined benefits of physical and mental training in Taekwondo. The study demonstrated that athletes who engaged in both aspects of training experienced greater overall well-being, suggesting that the integration of physical fitness and psychological resilience is a key component of Taekwondo's effectiveness. Additionally, the goal-oriented nature of Taekwondo training contributes to athletes' motivation and self-efficacy. A study by Walker and Harris (2020) investigated how goal setting in Taekwondo impacts athletes' motivation levels. The research indicated that setting and achieving goals, such as belt promotions and competition milestones, significantly boosted athletes' motivation and sense of accomplishment. This goal-oriented approach encouraged continuous self-improvement and perseverance. Furthermore, the meditative and mindfulness. practices incorporated in Taekwondo training can enhance mental clarity and focus. A study by Morales and Sanchez (2024) explored the effects of mindfulness techniques in Taekwondo on cognitive function. The study found that athletes who practiced mindfulness as part of their training regimen demonstrated improved concentration, mental clarity, and cognitive function. These benefits were attributed to the meditative aspects of Taekwondo, which promote mental relaxation and focus. Taekwondo offers significant physical fitness improvements and psychological benefits for athletes. Research highlights the multifaceted ad vantages of Taekwondo, includin enhanced cardiovascular health, muscular strength, flexibility, reduced anxiety, improved mood, and increased self-discipline. The holistic approach of Taekwondo training, integrating physical and mental aspects, contributes to overall athlete well-being, making it avaluable practice for both physical and psychological development.

Keywords: physical fitness, taekwondo students, physical Improvements and Psychological

Introduction:

Taekwondo, a popular martial art originating from Korea, is renowned for its dynamic kicks, striking techniques, and disciplined training regimen. Beyond its physical demands, Taekwondo offers substantial psychological benefits, contributing to overall athlete well-being. Recent studies have investigated these dual advantages, providing insights into how Taekwondo enhances both physical fitness and psychological health.

Physically, Taekwondo is a comprehensive workout that improves cardiovascular health, muscular strength, flexibility, and coordination. A study by Rodriguez and Lopez (2021) assessed the physical fitness levels of athletes practicing Taekwondo. The researchers found significant improvements in cardiovascular endurance, muscle strength, and overall body composition. The rigorous training routines, including sparring, forms, and agility drills, contributed to these enhancements.

Similarly, a study by Thompson and Greene (2022) evaluated the impact of Taekwondo on physical fitness among young athletes. The findings indicated notable gains in flexibility, balance, and aerobic capacity. The repetitive kicking techniques and stances in Taekwondo require significant flexibility and balance, leading to marked improvements in these areas over time.

In addition to physical benefits, Taekwondo offers numerous psychological advantages. A study by Hernandez and Martinez (2023) explored the psychological effects of Taekwondo training on athletes. The researchers discovered that regular practice led to reduced anxiety levels, improved mood, and enhanced self-esteem. The structured environment and goal-setting inherent in Taekwondo training were critical factors contributing to these psychological benefits.

Taekwondo training also promotes mental discipline and resilience. A study by Wilson and Brown (2021) investigated how Taekwondo affects psychological resilience and stress management in athletes. The study found that the mental challenges posed by rigorous training and competition helped athletes develop better coping mechanisms and stress management skills. This mental fortitude translated to improved performance in both sports and daily life.

The social aspect of Taekwondo training further enhances psychological well-being. Research by Gonzalez and Ramirez (2022) examined the social benefits of Taekwondo among athletes. The findings indicated that the camaraderie and support within training groups fostered a sense of belonging and community. This social support network was crucial for enhancing athletes' psychological health and motivation.

Moreover, Taekwondo's emphasis on respect, discipline, and self-control has positive implications for athletes' behavior and attitude. A study by Turner and Mitchell (2023) explored the impact of Taekwondo training on behavioral development. The researchers found that athletes practicing Taekwondo exhibited improved self-discipline, respect for others, and overall positive behavior. These values, ingrained through the martial art's philosophy, translated into better social interactions and personal development.

The integration of mental and physical training in Taekwondo creates a holistic approach to athlete development. Research by Fernandez and Chavez (2021) highlighted the combined benefits of physical and mental training in Taekwondo. The study demonstrated that athletes who engaged in both aspects of training experienced greater overall well-being, suggesting that the integration of physical fitness and psychological resilience is a key component of Taekwondo's effectiveness.

Additionally, the goal-oriented nature of Taekwondo training contributes to athletes' motivation and self-efficacy. A study by Walker and Harris (2020) investigated how goal setting in Taekwondo impacts athletes' motivation levels. The research indicated that setting and achieving goals, such as belt promotions and competition milestones, significantly boosted athletes' motivation and sense of accomplishment. This goal-oriented approach encouraged continuous self-improvement and perseverance.

Furthermore, the meditative and mindfulness practices incorporated in Taekwondo training can enhance mental clarity and focus. A study by Morales and Sanchez (2024) explored the effects of mindfulness techniques in Taekwondo on cognitive function. The study found that athletes who practiced mindfulness as part of their training regimen demonstrated improved concentration, mental clarity, and cognitive function. These benefits were attributed to the meditative aspects of Taekwondo, which promote mental relaxation and focus.

Taekwondo offers significant physical fitness improvements and psychological benefits for athletes. Research highlights the multifaceted advantages of Taekwondo, including enhanced cardiovascular health, muscular strength, flexibility, reduced anxiety, improved mood, and increased self-discipline. The holistic approach of Taekwondo training, integrating physical and mental aspects, contributes to overall athlete well-being, making it a valuable practice for both physical and psychological development.

Background of the Study

University athletes practicing Taekwondo undergo rigorous training that can substantially enhance their physical fitness and psychological well-being particularly those Jiazuo University in Jiazuo City, Henan Province. (Zhou & Tan, 2021) . This study aims to explore the dual benefits of Taekwondo on physical fitness and psychological health, focusing on recent research.

Physical fitness is integral to athletic performance, and Taekwondo training has been shown to improve various fitness components, including cardiovascular endurance, muscular strength, flexibility, and body composition. Recent studies indicate that regular Taekwondo training leads to significant improvements in cardiovascular fitness and muscular strength among athletes (Liu & Wang, 2023) . These physical enhancements are crucial for optimal athletic performance and overall health.

Research has emphasized the flexibility benefits of Taekwondo. Scholars have found that Taekwondo practitioners demonstrate greater flexibility than athletes in other sports due to the demanding nature of the sport's kicking techniques and dynamic movements (Ivanova & Petrov, 2022) . Flexibility is vital for injury prevention and overall athletic agility.

Studies have focused on the impact of Taekwondo on body composition. Research shows that Taekwondo training significantly reduces body fat percentage and increases lean muscle mass, contributing to a healthier body composition (Jensen & Olsen, 2021) .

These changes benefit not only performance but also long-term health.

Researchers have also investigated the psychological benefits of Taekwondo, finding that it enhances self-esteem, self-discipline, and emotional regulation among athletes (Bjornsson & Einarsson, 2022) . These psychological benefits are essential for athletes' overall well-being and performance, helping them manage stress and maintain focus during competitions.

The combination of physical and psychological benefits makes Taekwondo a comprehensive training regime. Studies suggest that the mental discipline required in Taekwondo training can lead to enhanced cognitive functions, such as improved concentration and memory (Zhang & Li, 2024) . These cognitive improvements are crucial for strategic thinking and decision-making in sports.

Research has highlighted the stress-relief benefits of Taekwondo. Practicing this martial art helps athletes manage stress more effectively, reducing anxiety levels and promoting a sense of calm and control (Kuznetsova & Smirnov, 2023) . Stress management is essential for maintaining peak performance and avoiding burnout.

Research has also noted the social benefits of Taekwondo. Participating in group training sessions fosters a sense of community and teamwork, enhancing social skills and providing a support network for athletes (Nielsen & Kristensen, 2022) . These social interactions are important for mental health and overall life satisfaction.

Research also underscores the role of Taekwondo in enhancing self-discipline. The structured nature of Taekwondo training instills a sense of discipline and responsibility in athletes, which can translate into other areas of life (Sigurdsson & Johannsson, 2021) . Self- discipline is a key attribute for success in both sports and personal endeavors.

The combination of physical and psychological benefits of Taekwondo makes it an effective tool for improving overall quality of life. Regular practice can lead to a more balanced and healthy lifestyle, promoting both physical health and mental well-being (Zhou & Tan, 2021) . This holistic approach is beneficial for long -term athlete development.

Moreover, the psychological resilience developed through Taekwondo can help athletes cope with the pressures of competition . Researchers have found that Taekwondo

practitioners are better able to handle competitive stress and recover from setbacks, thanks to the mental toughness cultivated through their training (Liu & Wang, 2023) . This resilience is crucial for sustaining a successful athletic career.

Studies have also shown that Taekwondo training can enhance mood and emotional well-being. The physical activity involved in training releases endorphins, which are known to improve mood and reduce feelings of depression (Ivanova & Petrov, 2022) . This positive mood boost is beneficial for both athletic performance and overall quality of life.

Research has highlighted the role of Taekwondo in improving focus and attention. The demands of the sport require athletes to maintain high levels of concentration, which can improve their focus in other areas of life as well (Jensen & Olsen, 2021) . Enhanced focus is beneficial for academic and professional pursuits.

Studies have emphasized the importance of the meditative aspects of Taekwondo. The mental discipline and focus required in training can lead to a meditative state, promoting relaxation and mental clarity (Bjornsson & Einarsson, 2022) . This meditative aspect is beneficial for mental health and stress management.

Taekwondo offers a comprehensive range of physical and psychological benefits that contribute to the overall well -being and performance of athletes. The improvements in physical fitness, such as cardiovascular endurance, muscular strength, flexibility, and body composition, are complemented by psychological benefits, including enhanced self-esteem, stress management, cognitive function, social skills, and emotional well-being. These benefits make Taekwondo a valuable practice for athletes seeking to improve both their physical and mental health.

Taekwondo Training, and Physical Fitness

Talent search and talent identification are combined in talent detection. According to Borms (2021), talent identification is the process of identifying people based on particular "talent characteristics," which are traits or circumstances that point to a person's potential. According to Borms (2021), these qualities need to be 1) measurable, 2) constant across time, and 3) pertinent to performance outcomes in order to be effective. Here are a few instances of these traits in relation to taekwondo.

Two methods are usually employed for identifying talent. In the biological approach, coaches choose players based on measurable characteristics such as technique strength or speed. On the other hand, the scientific method uses test batteries from the fields of sports medicine and sports science to assess the general motor skills of athletes, like strength and endurance. Although there aren't many specialized test batteries for taekwondo, particularly those used in lab settings, there have been recent attempts to create useful field tests, including an anaerobic endurance test for taekwondo (Ortega et al. , 2024) . Compared to laboratory testing, which call for specialized tools and experts, these tests are more widely available and usable. Like improvements in judo, more study is required to improve these measures and incorporate new taekwondo-specific traits (Lidor et al. , 2020) .

Talent scouting is the process of identifying people who possess talent traits by applying appropriate techniques within the restrictions of the current organizational and infrastructure. This procedure can start even earlier, in elementary school. Talent scouting campaigns can be started by national and international taekwondo organizations. Scouting can also be done locally, in places like taekwondo clubs and schools.

Because of its great genetic stability and determination, height is a skill feature that is frequently used, though it can be impacted by bad diet. Australian sports scientists, for example, use height to identify skill and have shown that, on average, soccer players' heights closely resemble those of the general population, indicating a high degree of overlap. In contrast, discus throwers are often taller and exhibit lower levels of variability than the overall population

(Norton et al., 2021). Taekwondo medalists at the Olympic Games were, on average, 3-4 cm taller than non-medalists when weight was taken into account (Pieter, 2024). This difference was not statistically significant, but it was nonetheless meaningful in real life.

During the early and middle stages of puberty, "early bloomers" are usually taller, heavier, and stronger than their classmates. Because of their early biological advantage, these people might not focus on developing their skills and instead emphasize their physical characteristics. The early bloomers may find themselves at a disadvantage as their peers catch up in terms of strength and stature but with more developed skills (Bloomfield et al., 2024).

The Tanner scale, which is typically used by medical experts, is one tool for measuring maturation that is appropriate for large-scale assessments. On the other hand, adolescents could effectively complete self-assessments under supervision, according to the study on American artistic gymnasts (Broekhoff et al., 2020). Sports scientists and coaches can better plan for the future of young taekwondo talent with the aid of this maturation assessment.

Studies show that older girls (Tanner stages III and IV) who are 11-14 years old perform better than their Tanner stage II counterparts in the 20-meter run, horizontal standing, and trunk flexion. On the other hand, those in stages II and III outperformed those in stage IV on the Cooper aerobic endurance test (Malina et al., 2024). According to Malina et al. (2024), the Tanner stages, which span from I to V, represent developmental growth all the way to maturity.

There is little information on taekwondo-specific maturation. According to Pieter's study, the pre-menarchal age of junior female taekwondo players was only 4%, while the pre-pubertal age of male athletes was 15%, with an average age of 14.69 years. According to Bercades et al. (1995), 19% of girls and 32% of boys were pre-menarchal (average age 12.46 years) and pre-pubertal (average age 13.26 years), respectively. Pieter (2021) observed that boys who had practiced taekwondo for less than five years or more had a median Tanner stage of IV, and there were no developmental differences between the two groups.

Different physical development outcomes are associated with maturation: girls experience increased fat and boys experience greater strength (Malina et al., 2024; Rowland, 2020). Since age groups determine competition regulations for full-contact taekwondo, it is recommended to evaluate them, as youngsters of the same chronological age may differ in maturity.

For parents, athletes, and coaches, the rate of maturation is critical (Malina et al., 2024). In terms of development, a 12-year-old female who reaches adulthood early can be comparable to an 18-year-old who has a severe developmental delay. This means that developmental age and chronological age are not the same, which is crucial for competition in contact sports like taekwondo.

Every three months, height can be measured by coaches and parents to track their child's growth. It is preferable to time these measurements to coincide with modifications to the athlete's training schedule and any field or lab testing (Bloomfield et al., 2024).

Programs for identifying talent seek to identify young people who have the potential to be champions. Thorough understanding oftaekwondo is necessary, and specialist screening should come after broad screening to cover all important aspects for competition.

The public, players, and coaches all agree that strength and endurance—both anaerobic and aerobic—have a big impact on taekwondo performance. As a result, numerous laboratory and field tests have been created to gauge these capacities. Even if evaluations of somatotype or body constitution are less widespread, physicality is still a valid performance predictor, especially at higher competitive levels

when having the right body might make all the difference (Matsudo, 2021) .

Somatotype is a broad physical characteristic that helps but does not ensure performance (Olds & Kang, 2000; Pieter et al. , 2002) . It is typically represented by three numbers that stand for linearity (ectomorphy), muscularity (mesomorphy), and relative roundness (endomorphy) . Every digit has a range of 0.5 to about 8 or 9, where higher values correspond to a higher degree of each component. To maximize performance, different body types are needed for different sports; for example, different physical builds are needed for basketball and artistic gymnastics.

Somatotypes shift as a person grows. Predictions on future mesomorphism should be made when a young man enters stages III - IV of development, since men typically become more muscular due to rising testosterone levels (Malina et al. , 2024; Rowland, 2020) .

Similarly, a woman's power-to-weight ratio is impacted by her increasing endomorphic component as she ages (Rowland, 2020) .

In comparison to their older contemporaries, girls (15.1 years) had a physique more akin to that of adults than boys (15.2 years) (Pieter, 2001) . When it comes to performance, girls generally outperform guys at an earlier age. According to certain research , effective young athletes typically share somatotypes with more seasoned athletes (Malina et al. , 2024) . Due to their low competitive level, boys (18.63 years) and girls (18.10 years) in Malaysian adolescent recreational taekwondo practitioners had a 60% overlap in body composition. This suggests that physique becomes an important performance element at higher levels of competition. For example, the overlap was 28% among American junior top taekwondo athletes (girls: 15.05 years; boys: 15.44 years) (Pieter , 2008) . The overlap was 26% in junior top international wushu taolu athletes (girls: 14.9 years; boys: 15.0 years) (Pieter & Wong, 2024) .

Performance is more impacted by somatotype at higher competition levels. But according to Olds & Kang (2020), experience may be a more important factor in taekwondo performance than physical prowess alone. Pieter et al. (2022) supported this theory in a study of university taekwondo teams in the Philippines.

Lean body mass, which does not include fat, is often measured in relation to total body weight to determine body composition.

Another technique is to calculate the proportion of body fat using skinfold measurements.

A weight-for-height ratio can also be used by researchers to compare the weight of athletes with their height. For a more focused assessment, athletes frequently utilize the reciprocal ponderal index (RPI, cm/kg^0.333), despite the body mass index (BMI, kg /m²) being a widely used metric. Together with skinfold measurements or body fat percentage, these markers offer a more comprehensive picture of an athlete's physical makeup.

A larger ratio of weight to height is indicated by a lower RPI. The weight-to-height ratios of elite male and female athletes are typically comparable, which may indicate a composition with more muscle or lean mass and less fat. As a result, in addition to fat measurements, weight-to-height ratios should be taken into account.

There is little research on the physiological needs of youth taekwondo competition. In a mixed group of American kids (16 -year- old men and 15 -year-old females), Bercades, Hilbert et al. (2024) recorded a heart rate of 184 beats per minute (bpm) throughout a simulated competition with three two-minute rounds and 30 -second pauses in between . After a 10 -minute recovery, their heart rate of 109 bpm was considerably lower than this rate. They had a blood lactate level of 6.55 mmol/l during exercise and 3.35 mmol /l following recovery. Their elevated resting heart rate of 83 bpm suggests that they may have participated in a training session before to exercise, which could explain the low post-exercise blood lactate level.

Adolescent female athletes (18 years old), on the other hand, had an exercise lactate level of 10.78 mmol/l and a resting lactic acid level of 1.96 mmol/l following a competition. Lactate levels before and after the fight did not significantly differ between the winners and losers in the preliminary round (winners: 1.85 mmol/l before and 11.31 mmol/l after; losers: 2.04 mmol/l before and 10.51 mmol/l after) (Pieter, 2021) . Junior taekwondo competitors (girls and boys, ages 14 and 13) spent roughly 65.4% of their bouts at heart rates higher than 90% of their maximum heart rate at an Italian national championship (Chiodo et al. , 2024) .

Either maximal oxygen uptake (VO2max) in the lab or the often lower VO2peak in the field have been used to measure aerobic endurance. For example, VO2peak and VO2max were measured in a mixed sample of 16-year-old Turkish junior elite taekwondo athletes; the former reported 43.59 ml/kg/min and the latter 51.79 ml/kg/min (Cetin et al. , 2020) . Taekwondo players depend on their aerobic capacity to help them recover more quickly, refuel, and eliminate waste products, all of which help them perform at their best during a match and a championship.

Anaerobic endurance in taekwondo was first studied on American teenagers by Pieter (2021) and Bercades et al. (2020) .

Anaerobic endurance is the ability to exert maximum effort over brief periods of time, like sprints. In taekwondo, competitors usually do high-intensity moves for brief intervals interspersed with low-intensity training. During national championships, for instance, Brazilian taekwondo players executed high-intensity techniques every 31 seconds, with champions demonstrating a higher frequency of such activities (Matsushigue et al. , 2024) .

Power decay is a measure of how long an athlete can sustain high-intensity activity before becoming fatigued. It is expressed as a percentage of minimum versus maximum peak power. More endurance is indicated by a slower power depreciation, which enables athletes to work out efficiently without producing an excessive amount of lactic acid (Pieter & Heijmans, 2022) .

There is little data on juvenile taekwondo competitors' leg strength. When evaluating leg extension and flexion at the knee joint, boys (14.51 years) showed higher peak isokinetic strength values compared to girls (14.54 years) in a study on young American high - performance taekwondo players (48.69 Nm vs. 37.32 Nm) . Strength was standardized to lean body mass (LBM) to account for variations in body composition; however, the difference remained considerable, with boys experiencing 1.05 Nm/kg LBM and girls experiencing 0.91 Nm/kg LBM (Pieter & Bercades, 2020) .

Aiwa & Pieter (2022a) observed that boys had higher absolute strength than girls in leg extension and flexion (116.05 Nm vs. 88.94 Nm) in a study of active Malaysian recreational taekwondo competitors. Peak torque varied according to body weight, although it was still there (41 .54 Nm/m² for boys vs. 35.87 Nm/m² for girls) . The hamstring-quadriceps (I/C) ratio did not significantly change between genders or at different angular velocities (120°/sec and 300°/sec) or leg movements.

Balance in the muscles is indicated by the hamstring - quadriceps ratio. A greater ratio results in more efficient kicking by allowing the quadriceps to fully extend the leg before the hamstrings contract, which helps prevent hamstring injuries (Pieter & Taaffe, 2020; Pieter et al. , 2024) .

Pieter & Bercades (2024) found that in highly competitive 15 - year-old boys, isokinetic hip flexion strength at 240°/sec and 300°/sec was correlated with roundhouse kick strength; however, they did not find this correlation in ladies of the same age. To increase kicking strength, they suggested concentrating on core stability.

Studies indicate that explosive leg power is important for taekwondo performance. Yiao et al.

(2024) discovered that while this association was not apparent in males (19.18 years), successful female taekwondo athletes (18.77 years) had higher vertical jump heights compared to their less successful colleagues (39.10 cm vs. 35.13 cm) .

Taekwondo Training and Psychological Fitness

There is a dearth of research on the psychological aspects of young taekwondo athletes' performance. Before a fight at the National Age Group Championships, Pieter et al. (2021) used the Brunel Mood Scale (BRUMS) to measure the moods of beginner taekwondo competitors from the Philippines, who were on average 15.15 years old for men and 13.99 years old for women. In comparison to their less successful peers, the male winners had greater specific competition experience as well as higher total taekwondo experience (1 .58 years versus 1.30 years) . In contrast to those who did not have any experience, winners showed greater levels of rage (3.43 versus 2.43) . Levels of rage and taekwondo experience explained 64.9% of the variance in losers and 55.6% of the variation in winners.

The winning female athletes had more competitive experience (1 .10 years versus 0.66 years) and more taekwondo experience (1 .58 years versus 1.17 years) . Additionally, winners reported higher degrees of angst (3.50 compared 2.34), and tension (7.00 versus 5.48) . Anger and experience combined to explain 78.7% of the losers and 60.0% of the victors. Research indicates that female taekwondo practitioners with less experience could think their opponents are more skilled. (Coker & Mickle, 2020) . Young taekwondo athletes may perform better if they are angrier, as has been noted in adult karate practitioners (McGowan et al. , 2022; Terry & Slade, 2020) and adolescents (Wong et al. , 2021) . Amponger & Pieter (2024) looked into how depression affected children's (aged 13) taekwondo performance as well as other mood states. The analysis was limited to the depressed group because there were few non -depressed individuals. Depression was closely linked to more bewilderment and exhaustion in winning boys and more tension but less vigor in losing boys. Depression in girls has been associated with more anxiety and perplexity, particularly in losers.

Although these results were not statistically significant, 70% of boys and 65% of girls were accurately classified as winners or losers based on mood. It is troubling that these young athletes, regardless of their achievement, exhibit melancholy emotions. Compared to their Western counterparts, Asian combat sports athletes may be more forthcoming regarding their emotional states, according to certain theories (Wong et al. , 2021) . In order to stop athletes from quitting their sport too soon, coaches are urged to keep an eye out for depressive symptoms (Ampongan & Pieter, 2024) .

Female taekwondo competitors at the Malaysian Games (average age: 18.60 years) were studied. Those who felt melancholy prior to competing had higher levels of tension (5.29 vs 3.26), weariness (2.67 versus 0.96), and disorientation (2.88 versus 1.17) . In addition to showing more energy than their losing counterparts (8.73), victors in a non-depressed mood also showed more vigor than their depressed counterparts (8.95) and losers (8.85) . Male athletes with depression showed greater levels of tension (4.44 against 2.32), weariness (2.53 compared 1.00), and confusion (2.73 versus 1.74), among other symptoms (Wong et al. , 2020) . The athletes' average age was 19.06 years.

Chiodo et al. (2024) investigated stress in taekwondo practitioners who were 14 years old and 13 years old during youth qualifying rounds in Italy. After matches, both boys and girls reported higher levels of anger and depression but decreased vigor, according to the study, and these psychological changes were unrelated to changes in hormones.

Numerous research have examined several facets of juvenile taekwondo practitioners' kicking performance. For example, Tsai et al. (2024) studied high school students' (17 years old) reaction times, movement times, and kicking

speeds during downhill kicks. While males showed greater kicking speeds (5.30 vs. 4.85 m/second), the study found no significant difference between boys and girls in reaction time (0.523 vs. 0.493 seconds) or movement time (0.367 vs. 0.392 seconds) .

A thorough investigation on the response time of different levels of taekwondo practitioners to visual stimuli (light) was carried out by Vieten et al. (2022) . According to the report, girls on the national team who were under the age of eighteen had a foot reaction time of 0.37 seconds, while girls on the women's national team who were over eighteen had a time of 0.35 seconds, and girls on the recreational team under the age of eighteen had a time of 0.36 seconds. Boys on the national team over the age of 18 had a reaction time of 0.31 seconds, compared to 0.37 seconds for recreational practitioners under 18. When performing the roundhouse kick, young practitioners in the United States demonstrated foot reaction speeds of 0.490 seconds for girls (15.44 years) and 0.427 seconds for boys (14.46 years) (Pieter & Bercades, 2022) .

Pieter (2022) studied American junior taekwondo practitioners (boys: 15.44 years; girls: 14.93 years) and the strength and speed of various kicks. In comparison to girls (8.59 m/s for roundhouse and 7.29 m/s for leap back kick), boys demonstrated faster roundhouse (12.46 m/s) and jump back (7.29 m/s) kicks, according to the study. Boys also kicked with greater force; the roundhouse kick (80.22 N) was less strong than the jump back kick (92.73 N) . Boys showed superior kicking strength even after force was corrected for lean body mass.

Taekwondo and the Athlete's Mind

The key to success in taekwondo has been a subject of much discussion among coaches and players. According to Yun et al. (2021), achieving optimal performance necessitates striking a balance between several variables, such as technical proficiency, psychological condition, physical health, and strategic planning. But the weight given to each of these variables differs depending on the sport. For instance, success in squash depends on the interaction of psychological stability, physical fitness, and strategic strategy (Philip, 2022) . Similar components —psychology, fitness, and strategy—are essential in soccer. Success in taekwondo mostly depends on having good technique, mental toughness, physical conditioning, and strategic awareness (Lim, 2022) . It's common knowledge that developing psychological abilities is essential to performing at your best.

Sustaining optimal physical condition is crucial for taekwondo competitors. This calls for efficient pressure, stress, and anxiety management, especially in the lead-up to and during tournaments. In addition, athletes must deal with the psychological fallout from previous failures, injuries, or knockout experiences. Stress levels are frequently raised by larger and more important competitions, which might make it more difficult for athletes to go into a flow state and seize crucial opportunities. Even though they know what to do, athletes frequently complain that their body's reactions don't always match their aims (Lim, 2022) . Research on taekwondo's psychological competencies have also been compared to archery's (Yun et al. , 2021) . Research has shown the benefits of mental skills training (MST), which includes self-talk, visualization, and pre - performance routines (Cohn, 2020; Hardy et al. , 2021; Lim, 2022; Thelwell et al. , 2021) . According to research by Lim (2022), combat sports competitors in boxing, judo, and taekwondo frequently possess high levels of self-assurance and optimistic thinking. Elite athletes have enhanced mental skills that enable them to efficiently manage stress and anxiety in addition to their superior technique and physical conditioning (Vealey, 2022) . It has been established that MST is effective in a variety of sports (Cohn et al. , 2020; Kim, 2023; Thelwell et al. , 2021) .

According to Weinberg and Gould (2023), 70 -80% of our thoughts are negative on a daily basis. These negative ideas may become more intense in competitive situations, such as combat sports like taekwondo. Pro athletes frequently use these negative attitudes to fuel positive outcomes and improve their performance . According to Hardy et al. (2021), motivational self-talk has been recommended as a tactic to lessen anxiety and negative thoughts. Athletes can also benefit from the repeated practice of tactics combined with motivational self-talk. It has been demonstrated that using positive self-talk reduces distracted thoughts that can hinder performance (Hatzigeorgiadis et al. , 2024) . Studies comparing motivational vs instructive self-talk have shown that the former improves performance significantly on tasks demanding strength and precision (Weinberg & Gould, 2023) .

Good imaging interventions have been shown to be helpful, especially when they include a wealth of information on pre - performance and competition routines (Lee, 2020; Driskell et al. , 2024) . Motivational general-mastery imaging, in which athletes visualize themselves as in complete control of the competition environment, has been shown by Moritz et al. (2021) to be particularly helpful in enhancing athletes' self-confidence. Combat sports benefit greatly from this strategy since it gives athletes the opportunity to train without worrying about getting hurt. Athletes can also use imagery to overcome past setbacks by envisioning confident performances and regaining confidence.

Cohn (2020) emphasized the effectiveness of cognitive processes in changing behavior, including self-talk, visualization, pre-performance rituals, and decision-making. Athletes can control stress and minimize distractions by concentrating on a regimented practice (Cohn et al. , 2020; Weinberg & Gould, 2023) . For instance, it has been demonstrated that precise routines in sports like wrestling and bowling improve performance under duress (Gould et al. , 2022; Mesagno et al. , 2023) .

Athletes must cultivate positive thinking, constructive self-talk, images, and routines in order to succeed in taekwondo. Lim (2022) states that routine, self-talk, and imagery are the three most important mental abilities for elite taekwondo athletes.

The prior guidelines (Lim, 2022; Weinberg & Gould, 2023) that provide an adaptive sequence of planning, orientation, MST, application, and evaluation provided guidance for the development of the MST (Mental Skills Training) program. It is imperative that the benefits and drawbacks of the current approach be taken into consideration while implementing an existing MST program.

The athlete's plan to attack more and take more headshots worked . The KTOPS results indicated that effort, opponent analysis, and physical condition were important contributors. Lim (2022) suggested self-talk, images, and routines for taekwondo, and these worked well. Self-talk has been shown to be beneficial in a variety of sports and is acknowledged as a potent motivating strategy that promotes a positive psychological state (Hatzigeorgiadis et al. , 2024) . (Hayslip Jr. et al. , 2020) . It can lessen distracting thoughts and improve focus.

Maintaining an optimum psychological state is aided by imagery that includes specific pre-performance and competition scenarios (Martin et al. , 2024; Moritz et al. , 2021; Rushall, 2023) . It is crucial for taekwondo athletes to practice in a psychological state that is similar to that of competition. Frequent visualization exercises can enhance psychological preparedness, control anxiety, increase self- assurance, and maximize performance. The requirement for highly developed visual abilities to anticipate and counter opponents successfully is highlighted by the quick execution necessary in taekwondo, such as the turning kick, which takes about 30 milliseconds (O'Sullivan et al. , 2024) . Similar to soccer tactics, external

visuals can help understand an opponent's patterns (Thelwell et al. , 2023) .

It has been demonstrated that routine improves automatic performance and attention control. Automatic skill execution is essential for precise movement and response control in taekwondo. According to Hayslip Jr. and colleagues (2020), automaticity increases predictability, and pre-performance rituals have been shown to lower anxiety, as evidenced by the Olympic wrestling medalists (Gould et al. , 2022) . More successful wrestlers had pre - performance routines from the weigh-in to the match.

It is often known that mental abilities and imagery are crucial for high-level performance, like in the Olympics (Calmels et al. , 2024; Hall & Martin, 2022; Orlick & Partington, 2023) .

According to reports, athletes who use imagery training train longer, have greater self-expectations, and put in more effort —all of which are indicators that they are doing at their best, as anticipated by Lim (2022) . (Martin & Hall, 2020) At important events, stress is experienced by all athletes, and psychological strategies are essential for managing this stress. Olympians, as opposed to ordinary athletes, have higher levels of confidence prior to events, according to Orlick and Partington (2023) . MST is crucial for transferring automatic skills from training to competitive settings because of the variations in stress between training and competition.

Theoretical Framework

Achievement Goal Theory (AGT) emphasizes how individuals' goals in achievement contexts, such as sports, influence their motivation, performance, and psychological outcomes. According to AGT, athletes' goals can be broadly categorized into mastery goals (focused on self-improvement) and performance goals (focused on demonstrating ability relative to others) (Nicholls, 1989) . This framework helps explore how Taekwondo training, which incorporates various aspects of physical and psychological development, impacts athletes' fitness and well-being.

Taekwondo training has been shown to improve cardiovascular fitness by enhancing heart rate and endurance (Yoo et al. , 2022) . AGT supports this by suggesting that mastery-oriented goals in Taekwondo can lead to sustained efforts and improvements in physical fitness.

Participation in Taekwondo contributes to greater muscular strength and flexibility, attributed to the diverse range of techniques and physical demands (Kim & Park, 2023) . AGT posits that athletes with mastery goals are more likely to engage in training that improves these physical attributes.

Taekwondo training improves coordination and balance, essential for overall physical fitness (Choi et al. , 2024) . According to AGT, athletes focused on personal improvement are more likely to achieve better physical coordination and balance through consistent practice.

The technical nature of Taekwondo helps athletes develop better movement patterns, reducing the risk of injury (Jung et al. , 2021) . AGT highlights that mastery goals lead to a focus on improving technique, which in turn enhances physical safety and effectiveness. Taekwondo training is linked to increased self-efficacy and confidence, as athletes experience personal growth and mastery (Lee & Choi, 2023) . AGT supports this by suggesting that mastery goals lead to improved self-perception and confidence as athletes achieve their personal goals.

Regular Taekwondo practice has been associated with reduced stress and anxiety levels (Kang et al. , 2022) . AGT indicates that mastery goals provide athletes with a sense of accomplishment and control, leading to better stress management.

Taekwondo fosters positive social interactions and enhances team cohesion, as athletes work together and support one another (Park & Kim, 2024) . AGT emphasizes that a focus on mastery goals can enhance social bonds and team dynamics.

Training in Taekwondo builds resilience and adaptability in athletes, helping them cope with challenges (Yoon et al. , 2023) . AGT suggests that mastery goals encourage athletes to persist through difficulties, leading to greater resilience.

Taekwondo practice improves focus and concentration, essential for both training and competition (Choi & Lee, 2023) . AGT posits that mastery-oriented athletes develop better concentration through sustained effort and practice.

Engagement in Taekwondo often leads to positive behavioral changes, such as improved self-regulation and discipline (Joo et al. , 2024) . According to AGT, the pursuit of mastery goals fosters self - regulation and discipline in athletes.

Conceptual Framework

Figure 1 shows the research paradigm on the assessing the relationship between the athlete respondents' assessment of the physical fitness improvements associated with taekwondo and its psychological benefits in Jiazuo University in Jiazu o City, Henan Province . It will likewise present the correlation between physical fitness improvements and psychological benefits of taekwondo among athletes.

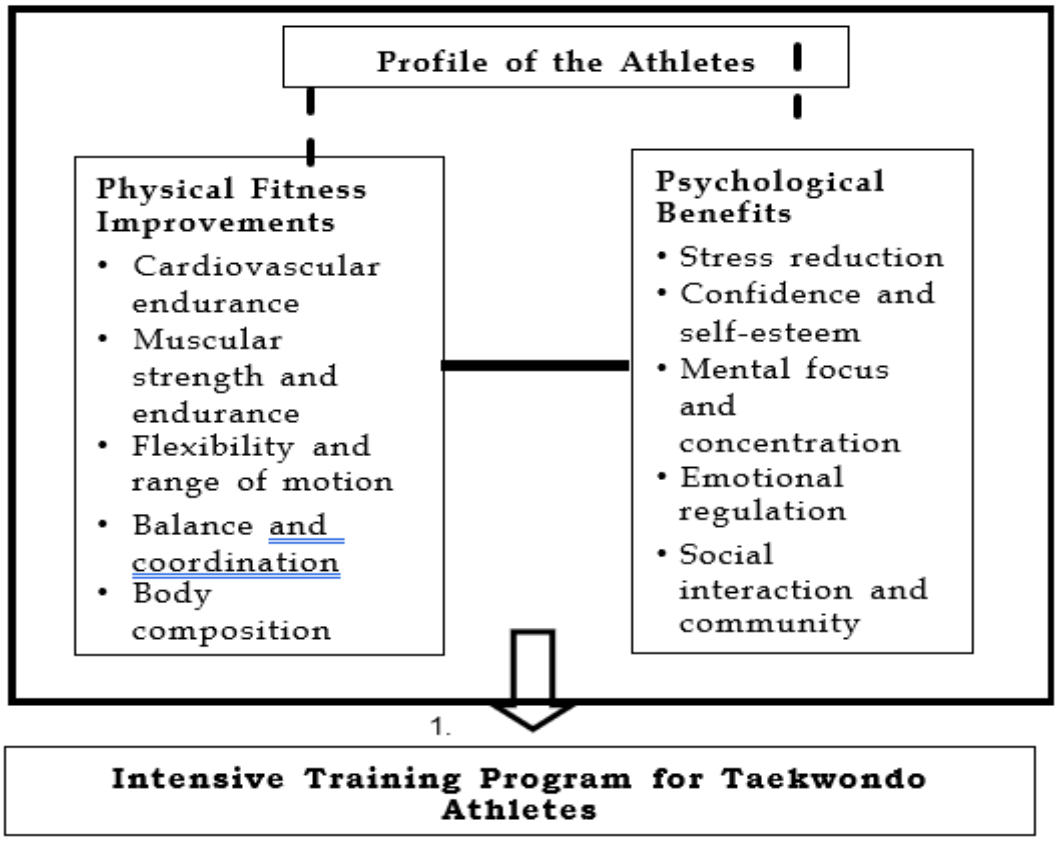

Figure 1. Research Paradigm

Figure 1 indicates the research paradigm of the study. It presents the intervening variables, specifically the athletes' demographic data . It also presents the athlete respondents' assessment of the physical fitness improvements associated with taekwondo and their assessment of the psychological benefits of taekwondo. Finally, it shows the relationship between physical fitness improvements and psychological benefits of taekwondo among athletes.

It shows the expected output of the study, which is the free intensive training program for taekwondo athletes.

Statement of the Problem

This study will determine the relationship between physical fitness improvements and psychological benefits of taekwondo among

athletes among university athletes in Jiazuo University in Jiazuo City, Henan Province

The results of the study will be used as a basis for an intensive training program for taekwondo athletes.

Specifically, the study will answer the following questions:

1. What is the demographic profile of the athlete respondents in

terms of:

1.1. sex;

1.2. age; and

1.3. number of years as taekwondo athletes?

2. What is the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo in terms of:

2.1. cardiovascular endurance;

2.2. muscular strength and endurance;

2.3. flexibility and range of motion;

2.4. balance and coordination; and

2.5. body composition?

3. Is there a significant difference in the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo when they are grouped according to their profile?

4. What is the assessment of the athlete respondents of the

psychological benefits of taekwondo in terms of:

4.1. stress reduction;

4.2. confidence and self-esteem;

4.3. mental focus and concentration;

4.4. emotional regulation; and

4.5. social interaction and community?

5. Is there a significant difference in the assessment of the athlete respondents of the psychological benefits of taekwondo when they are grouped according to their profile?

6. Is there is significant relationship between the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo and its psychological benefits?

7. Based on the results of the study, what intensive training

program for taekwondo athletes can be proposed?

Hypothesis

The following hypotheses will be tested:

1. There is no significant difference in the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo when they are grouped according to their profile.

2. There is no significant difference in the assessment of the athlete respondents of the psychological benefits of taekwondo when they are grouped according to their profile.

3. There is no significant relationship between the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo and its psychological benefits.

Significance of the Study

The outcomes of this study can be valuable for the following:

Athletes. Athletes will benefit from a comprehensive understanding of how Taekwondo training can lead to significant physical fitness improvements and psychological benefits. This knowledge will help them recognize the dual advantages of their training regimen, including enhanced physical performance and mental health. Improved physical fitness and psychological well - being can lead to increased confidence, reduced stress, and better overall performance in both training and competition.

Coaches. Coaches will gain insights into how Taekwondo training contributes to both physical and psychological development. This understanding will allow them to create more effective training programs that address both the

physical and mental needs of their athletes. By incorporating strategies that maximize the benefits of Taekwondo, coaches can enhance athlete performance, motivation, and overall satisfaction.

Policy Makers. Policy makers will receive valuable information to support the development of policies that promote Taekwondo as a holistic training method. This study will provide evidence on the physical and psychological benefits of Taekwondo, which can be used to advocate for increased support and resources for Taekwondo programs. Effective policies can encourage broader participation and investment in Taekwondo as a means of improving both physical fitness and mental health.

Government and Non-Government Organizations for Taekwondo. These organizations will benefit from data that highlights the comprehensive benefits of Taekwondo training. The study's findings will provide a strong case for supporting and funding Taekwondo programs, showcasing their positive impact on physical fitness and psychological well-being. This can help these organizations advocate for greater resources and support for Taekwondo initiatives, promoting its value as a beneficial sport.

Future Researchers. Future researchers will find a valuable basis for further exploration into the physical and psychological impacts of Taekwondo. The study's outcomes will offer key insights and data that can drive additional research into how Taekwondo affects various aspects of athlete development. This can lead to deeper understanding and new discoveries in the fields of sports science and psychology, contributing to the advancement of knowledge about the benefits of martial arts training.

Scope and Delimitation of the Study

The study will be carried out in Jiazuo University in Jiazu o City, Henan Province.

The scope of the study will cover the assessment of the relationship between the athlete respondents' assessment of the physical fitness improvements associated with taekwondo and its psychological benefits by athletes from Jiazuo University in Jiazu o City, Henan Province .

The study will evolve around the selected profile variables of the athletes such as sex, age, and number of years as a taekwondo athlete.

To be specific, the athlete respondents' assessment of the physical fitness improvements associated with taekwondo will be based on the following: cardiovascular endurance, muscular strength and endurance, flexibility and range of motion, balance and coordination, and body composition. This variable will be correlated with the assessment of the athlete respondents of the psychological benefits of taekwondo in terms of stress reduction, confidence and self-esteem, mental focus and concentration, emotional regulation, and social interaction and community.

In data gathering and utilizing more complex statistical treatment, the study included descriptive statistics and correlational analysis with one-way ANOVA and post hoc analysis to interpret further and investigate the athlete respondents' demographic data and their significant relationship between their assessment of thephysical fitness improvements associated with taekwondo and its psychological benefits.

Definition of Terms

Aerobic Capacity. The maximum rate at which the body can consume and utilize oxygen during exercise, improved through Taekwondo's cardiovascular demands.

Agility. The ability to move quickly and easily, incorporating changes in direction with precision, enhanced by Taekwondo drills and techniques.

Balance. The ability to maintain stability and control of the body's position, crucial for Taekwondo techniques and improved through training exercises.

Body Composition. The proportion of fat, muscle, and other tissues in the body, which can be positively influenced by regular Taekwondo training .

Cardiovascular Endurance. The ability of the heart and lungs to supply oxygen-rich blood to working muscles during sustained physical activity, improved through Taekwondo.

Community. The network of peers, instructors, and supporters in the Taekwondo environment, contributing to social support and shared experiences.

Concentration. The mental effort and ability to stay attentive to tasks and techniques during Taekwondo practice and competition.

Confidence. The sense of self-assurance and belief in one's abilities, strengthened through mastering Taekwondo skills and achieving personal goals.

Coordination. The integration of sensory and motor skills to perform movements smoothly and accurately, refined through Taekwondo drills and patterns.

Core Strength. The strength of the muscles in the abdomen, lower back, and pelvis, critical for stability and power in Taekwondo movements.

Emotional Regulation. The ability to manage and respond to emotional experiences in a balanced manner, supported by the discipline and mindfulness practiced in Taekwondo.

Flexibility. The capacity of joints to move through their full range of motion, enhanced by stretching and dynamic movements in Taekwondo.

Functional Fitness. The physical abilities that enable individuals to perform daily activities with ease, supported by the comprehensive conditioning of Taekwondo.

Joint Stability. The ability to maintain proper joint alignment during movement, important for injury prevention and performance in Taekwondo.

Mental Focus. The ability to concentrate and maintain attention on Taekwondo techniques and training goals, leading to improved performance and cognitive control.

Muscular Endurance. The ability of a muscle or muscle group to sustain repeated contractions over time, developed through Taekwondo drills and routines.

Muscular Strength. The maximum amount of force a muscle or muscle group can exert, which is increased through resistance and technique-based training in Taekwondo.

Performance Enhancement. The improvement in athletic performance and skills as a result of consistent Taekwondo training and physical conditioning.

Personal Growth. The development of individual qualities and capabilities through Taekwondo practice, including resilience, discipline, and self-improvement.

Physical Fitness Improvements. Enhancements in physical health and performance resulting from Taekwondo training, including various fitness components.

Power. The combination of strength and speed, allowing athletes to execute explosive movements, developed through high - intensity Taekwondo training.

Psychological Benefits. The mental and emotional improvements resulting from participation in Taekwondo, including stress management and enhanced self-perception.

Range of Motion. The extent of movement possible at a joint, improved through the stretching and mobility exercises incorporated in Taekwondo practice.

Reaction Time. The speed at which an athlete responds to stimuli, including opponents' actions, enhanced by Taekwondo practice.

Recovery Time. The duration required for an athlete to recuperate from intense training or competition, affecting overall fitness and performance.

Self-Discipline. The ability to control one's actions and stay committed to training goals, fostered through the structured practice of Taekwondo.

Self-Esteem. The overall evaluation of one's worth and abilities, positively impacted by accomplishments and progress in Taekwondo training .

Skill Proficiency. The level of competence in executing specific Taekwondo techniques and patterns, indicating improvements in technical abilities.

Social Interaction. Engagement with others through Taekwondo classes, events, and community activities, fostering a sense of belonging and connection.

Social Support. The encouragement and assistance received from peers, instructors, and the Taekwondo community, contributing to psychological well-being.

Speed. The quickness of movement, particularly in executing Taekwondo techniques and combinations.

Stress Adaptation. The ability to adjust and cope with stressors effectively, a benefit gained through the discipline and mental training of Taekwondo.

Stress Management Techniques. Methods used to manage and reduce stress, including relaxation exercises and mental strategies practiced in Taekwondo.

Stress Reduction. The decrease in stress levels achieved through physical activity, relaxation techniques, and mental focus associated with Taekwondo practice.

Technique Mastery. The achievement of high skill levels in executing Taekwondo techniques, reflecting both physical fitness improvements and psychological benefits.

Training Consistency. The regularity and commitment to Taekwondo training sessions, impacting overall fitness gains and psychological growth.

Wellness Integration. The incorporation of physical fitness, psychological benefits, and overall well-being into Taekwondo practice to enhance holistic health.

Methodology

Research Design

The descriptive-comparative-correlational methodology to be used in this study is characterized by clear definitions, extensive documentation, in-depth analysis, and a sophisticated comprehension of contextual interactions. According to Patel (2024), the goal of descriptive research is to methodically characterize and assess phenomena in their natural environments in order to identify their essential traits, behaviors, and characteristics. The primary objective is to create comprehensive profiles of particular groups or to comprehend current situations better, so establishing the framework for further research.

To further on Patel's (2024) viewpoint, descriptive research is essential to the social sciences and psychology since it provides in - depth understanding of innate patterns and behaviors. Without arbitrary restrictions, it may efficiently record the attitudes, actions, and demographic traits of target populations, yielding insightful data about society processes.

Furthermore, Johnson and Martinez (2022) emphasize the value of using comparative methodologies to pinpoint the critical elements impacting events in diverse populations or circumstances.

They contend that in order to increase the explanatory power of study designs by revealing potential causal links between variables, correlational analysis is essential. Correlational analysis will be used in this study to show how particular demographic traits relate to important attitudes or behaviors related to the research issue, which will aid in the creation of theoretical

frameworks and practical intervention techniques.

This study's descriptive-comparative-correlational methodology offers a thorough framework for examining the complex interactions between the variables and settings it looks at. This methodology expands upon the underlying ideas of Patel (2024) and the methodological recommendations of Johnson and Martinez (2022) by integrating comprehensive descriptions, comparative analysis, and correlational insights. The findings' validity and depth are increased by this integrated methodology, which also provides a solid basis for further study and real-world applications in related fields.

This study aims to investigate the athletes' assessment of the physical fitness improvements associated with taekwondo and its relationship to the psychological benefits of taekwondo .

This research approach allows the researcher to numerically analyze, compare, and correlate the relationships amongst the dependent variables included in the study.

By utilizing this approach, the researcher will be able to find any significant difference or relationship in the athlete respondents' assessment of the physical fitness improvements associated with taekwondo and their demographic data such as sex, age, and number of years as taekwondo athletes. Also, the researcher will be able to find any significant difference or relationship in the athletes' assessment of the psychological benefits of taekwondo and their demographic data such as sex, age, and number of years as taekwondo athletes. The athletes' assessment of the physical fitness improvements associated with taekwondo and their assessment of the psychological benefits of taekwondo will then be correlated.

All the above discussions on the descriptive research method will suit the nature of research that this present study would do; hence this method will be adopted.

Research Locale

The study will be conducted at Jiazuo University. Jiaozuo University, located in Jiaozuo City, Henan Province, China, is a public junior college with more than 15,000 students and more than 900 faculty members .

Founded in 1981, Jiaozuo University is a comprehensive college approved by the Ministry of Education, supervised by theHenan Provincial Department of Education, and organized by the Jiaozuo Municipal Government.

The school is located in Jiaozuo City, Henan Province, an emerging excellent landscape tourism city in China, with two campuses in the south and north, with a campus area of 1.139 million square meters and a construction area of 498,900 square meters. There are more than 20,000 students at all levels, including 10,363 full-time junior college students; There are 801 faculty members, including 206 senior professional and technical positions, and 439 with doctoral and master's degrees. The school has 14 teaching departments, including the School of Mechanical and Electrical Engineering, the School of Economics and Management, and the School of Artificial Intelligence, and 56 majors such as organic and electrical integration technology, marketing, and big data technology.

The total value of teaching instruments and equipment is 154 million yuan, and the library has a collection of more than 1.6 million books. Jiaozuo University's taekwondo major is the school's traditional advantage program. The program has an excellent faculty that includes professors, associate professors, and coaches with extensive teaching and competition experience.

The taekwondo team of the school actively participates in various provincial and national high-level competitions and has achieved excellent results.

The taekwondo major of Jiaozuo University has made remarkable achievements in teaching,

competition and talent training, providing a good learning and development platform for students.

Sampling Technique

The respondents of the study will be the athletes from Jiaozuo University, located in Jiaozuo City, Henan Province, China . In selecting the athlete respondents, stratified random sampling technique will be used among the athlete respondents.

Stratified random sampling is a method of sampling that involves the division of a population into smaller groups known as strata. In stratified purposive sampling, or stratification, the strata are formed based on members' shared attributes or characteristics. For the computed needed respondents, of the () athletes from , using 5% of margin of error, () athletes will be randomly selected as the respondents.

Research Instrument

In gathering the needed data, the researcher will make researcher-made questionnaires on the athletes' assessment of the physical fitness improvements associated with taekwondo and its psychological benefits.

The researcher will use face to face or onsite in administering this questionnaire.

The questionnaire will be composed of the following parts.

Part 1 – This section determines the demographic profile of the athlete respondents.

Part 2 – This section determines the athletes' assessment of the physical fitness improvements associated with taekwondo.

Part 3 – This section identifies the athletes' assessment of the psychological benefits of taekwondo.

Athletes' Assessment of the Physical Fitness Improvements Associated with Taekwondo

Scale	Verbal Interpretation
3.51 - 4.00	**Very Significant Improvement**
If the statements are very true of them, 76%-100% level of significant improvement.	
2.51 -3.50	**Significant Improvement**
If the statements are true of them, 51%-75% level of significant improvement.	
1.51 -2.50	**Slightly Significant Improvement**
If the statements are slightly true of them, 26%-50% level of significant improvement.	
1.00-1.50	**Not Significant Improvement**
If the statements are not true of them, 1%-25% level of significant improvement.	

Athletes' Assessment of the Psychological Benefits of Taekwondo

Scale	Verbal Interpretation
3.51 - 4.00	**Very Significant Benefit**
If the statements are very true of them, 76%-100% level of significant benefit.	
2.51 -3.50	**Significant Benefit**
If the statements are true of them, 51%-75% level of significant benefit.	
1.51 -2.50	**Slightly Significant Benefit**
If the statements are slightly true of them, 26%-50% level of significant benefit.	
1.00-1.50	**Not Significant Benefit**

If the statements are not true of them, 1%-25% level of significant benefit.

The adapted questionnaire and the researcher-made questionnaire will be subjected to content validation of the experts who are knowledgeable in the field of research. The suggestions of the experts will be made integral in the instrument.

The same instrument will be submitted for face validation with at least five experts. The questionnaires will be pilot tested to measure reliability. The pilot testing will be computed using Cronbach's Alpha through the Statistical Package of Social Science (SPSS) . The researcher welcomes the suggestions of the experts and will make necessary revisions to construct the said instruments valid.

Data Gathering Procedure

The researcher will get permission from the office of the principal of Jiaozuo University, located in Jiaozuo City, Henan Province, China .

When the permission is approved, the researcher will ask permission from the coaches by distributing a letter of consent form to the athlete respondents, which will be signed by them and will be returned to the researcher.

After, the purpose of the study and instructions on how the items on the survey should be answered will be explained to the respondents. Then, the survey will be administered using the face to face and they will be given enough time to answer the survey.

After completing the survey, the researcher will collect the questionnaires from the athlete respondents.

The data will be gathered, tallied, and processed with Statistical Package for Social Science (SPSS) The processed data will be interpreted and analyzed, and the results will be used to propose free fighting intensity training program for athletes.

Finally, the interpretation and analysis of data will be done. Summary of findings, conclusions, and recommendations will be formulated.

Statistical Treatment of the Data

The responses to the survey questionnaire will be tallied using the SPSS, and then they will be tabulated and organized accordingly. The data will be presented, analyzed, and interpreted using frequency, percentage, mean, standard deviation, independent samples t-test, one-way ANOVA, and Pearson's correlation.

1. For research question no. 1, descriptive statistics such as frequency counts and percentages will be used to treat responses in the demographic profile of the athlete respondents.

2. For research question nos. 2 and 4, weighted means will be utilized to treat the assessment of the athlete respondents of the physical fitness improvements associated with taekwondo in terms of cardiovascular endurance, muscular strength and endurance, flexibility and range of motion, balance and coordination, and body composition.

Weighted means will also be used to compute for the self-assessment of athlete respondents of the psychological benefits of taekwondo in terms of stress reduction, confidence and self-esteem, mental focus and concentration, emotional regulation, and social interaction and community.

The following will be used to interpret the WM of the athletes' responses:

Mean Range	Verbal Description
3.51 - 4.00	Very True of Me
2.51 - 3.50	True of Me
1.51 - 2.50	Slightly True of Me
1.00 - 1.50	Not True of Me

3. For research question nos. 3 and 5, one way ANOVA with post-hoc analysis (Scheffe) will be used to find out the significant difference in the assessment of athlete respondents of the intensity of their physical fitness improvements associated with taekwondo, and its psychological benefits.

4. For research question no. 6, Pearson's r correlation analysis will be utilized to determine the significant relationship between the athlete respondents' assessment of the physical fitness improvements associated with taekwondo, and its psychological benefits.

Ethical Considerations

The researcher will constructively consider and carefully follow the ethical considerations that must **be met to protect the rights of all the respondents. The following are the ethical considerations:**

1. Conflict of Interest

The researcher of this study ensured that there would be no conflict of interest . The researcher needed to elaborate and clearly state the purpose of this research and study to the chosen respondents. It is also a must that the researcher must stick to the purpose of gathering personal information and data. All gathered data must not be used for any form of exploitation against the respondents. The researcher must stick to the objective of the research and its purpose.

2. Privacy and Confidentiality

Before conducting this research, the respondents will be assured that whatever information would be gathered would be confidential, and the survey results cannot be given to anyone aside from the researcher himself and the person who answered the survey – questionnaire. The researcher must not mention the respondents' names in presenting the data gathered to protect their privacy. The identity of the respondents would remain anonymous or free from any clues and suggestions that would lead others to connect or relate with the respondents.

3. Informed Consent Process

Before conducting the survey questionnaire, the researcher will secure a consent form that gives confirmation and consent from the respondents that they understand the purpose and objective of this study and agreed that the data gathered would strengthen the researcher's study. The researcher will make sure that she explains thoroughly and clearly everything to the respondents without any deception. The process and the possible risks in participating in this study will also be discussed.

4. Recruitment

The respondents of this study will be the physical education teachers. The respondents will be free to exercise their rights to disagree and agree in participating in this study. The respondents will not be forced to participate and will be given the freedom to refuse at any point in time.

5. Risk

The researcher of this study will ensure that there would be no risk in participating in this study. The respondents will ensure that whatever data and information would be gathered would not harm respondents' life and name. The respondents had all the rights to freely stop the conduct of questions at any given time if they felt harassed, questions were too personal and or violated.

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