PREVALENCE OF EXERCISE ADDICTION AND ITS ASSOCIATION WITH PSYCHOLOGICAL WELL-BEING AND SOCIAL SUPPORT AMONGST AMATEUR ATHLETES.

BY

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CERTIFICATION

This is to certify that the research work titled "PREVALENCE OF EXERCISE ADDICTION AND ITS ASSOCIATION WITH PSYCHOLOGICAL WELL-BEING AND SOCIAL SUPPORT AMONGST AMATEUR ATHLETES" has been conducted by NWANKWO GODSFAVOUR CHHINAZAEKPERE with matriculation number BMS2101722 under the supervision of Dr. Saturday Nicholas Oghumu in the department of Physiotherapy, School of Basic Medical Sciences, University of Benin as part of the requirements for the award of Bachelor of Physiotherapy (B.PT).

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DEDICATION

This dissertation is dedicated to God Almighty who made this work a reality and to my late Parents, Mr. and Mrs. Nwankwo.

ABSTRACT

Background: Exercise, while generally beneficial, can become compulsive and addictive, negatively impacting an athlete's physical and psychological health. Understanding the prevalence of this condition and its relationship with key well-being indicators is crucial for identifying at-risk individuals and developing effective intervention strategies among athletic populations.

Aim: This study aimed to determine the prevalence of exercise addiction among amateur athletes and examine the association between exercise addiction, psychological well-being (specifically depression, anxiety, and stress), and perceived social support within this population.

Methods: This was a cross-sectional study utilizing a consecutive sampling technique to recruit a sample of amateur athletes from the University of Benin. Data were collected using three standardized self-report instruments: the Exercise Addiction Inventory (EAI), the Depression, Anxiety and Stress Scale (DASS-21), and the Social Support Questionnaire (SSQ). Descriptive statistics were used to determine prevalence, while inferential statistics, such as correlation analysis, were employed to explore the association between the variables.

Results: The study identified a quantifiable prevalence of exercise addiction among the amateur athletes. Significant associations were found, indicating that increased levels of exercise addiction were positively correlated with higher levels of psychological distress (depression, anxiety, and stress). Conversely, there was a statistically significant inverse correlation between exercise addiction and the level of perceived social support.

Conclusion: Exercise addiction is a significant issue among amateur athletes at the University of Benin and is strongly associated with poor psychological well-being and reduced social support. These findings highlight the need for screening for exercise addiction in sports settings and incorporating psychological support and social network strategies into athlete welfare programs to mitigate the associated risks.

Keywords: Exercise Addiction, Amateur Athletes, Psychological Well-being, Social Support, Prevalence, University of Benin.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Engaging in regular exercise can lower the risk of chronic lifestyle diseases, boost physical health, and enhance overall quality of life (Bushaman, 2020; Noseworthy et al., 2023; Sabag et al., 2023). In addition, regular exercise is recognized as an effective way to enhance physical, social, psychological, and mental well-being (World Health Organization, 2018; Mayolas-Pi et al., 2025). However, despite its many benefits, the motivation to engage in regular exercise can sometimes contribute to the development of maladaptive behaviors (Lampe et al., 2023). One of these maladaptive behaviours is exercise addiction (EA). Exercise Addiction is a behavioral condition characterized by an unhealthy obsession with physical activity, where an individual feels compelled to exercise excessively despite potential harm to their physical health, mental well-being, or social life (Juwono et al., 2023).

Exercise addiction, characterized by an unhealthy obsession on exercise, often emerges as individuals increase their time and commitment to exercise routines (Bóna et al., 2019). Athletes struggling with EA may experience symptoms like depression, anxiety, irritability, and withdrawal when they are unable to work out (Berczik et al., 2012). For amateur athletes, regular exercise is critical for maintaining peak performance and boosting physical fitness. However, studies suggest that EA can negatively affect physical and mental health of athletes, largely due to the intense physical and emotional demands it places on individuals (Juwono et al., 2022; Mayolas-Pi et al., 2025). Exercising in exaggerated volumes and in an uncontrolled way could result in injury and damage to the physical, psychological, and/or social life of the affected

individual (Caru et al., 2022). Increasing workout or training times often ignores fatigue and also increases the risk of sometimes irreversible physical injuries. While exercise addiction is not classified as a psychiatric disorder, it has been linked to mood disorders (Weinstein and Szabo, 2023), eating disorders (Ahorsu et al., 2023) and other behavioral addiction (Meyer et al., 2021).

Exercise Addiction is a complex condition, and its exact causes remain unclear (Juwono et al., 2023). It can present as a primary issue, where EA itself is the main concern, or as a secondary issue, arising as a result of other underlying problems such as eating disorders, body image issues, or difficulties with weight regulation (Lukács et al., 2019). Exercise addiction has also been linked to various effects on mental, physical, psychological and social health (Mayolas-Pi et al., 2016). For instance, Mayolas et al. (2016) study showed that amateur cycling athletes with exercise addiction display worse values of mental quality of life, quality of sleep and anxiety as compared to those who are not addicted to exercise. Another study by Caru et al. (2022) showed that amateur athletes with exercise addiction showed a higher prevalence of pain and musculoskeletal injuries while Levit et al. (2018) shows that exercise addiction can lead to another maladaptive behaviours called eating disorders. These studies (Mayolas-Pi et al., 2016; Levit et al., 2018; Caru et al., 2022) reinforces the fact that exercise addiction has detrimental effects on various components of health of an amateur athlete.

Amateur athletes, who engage in sports for personal enjoyment or fitness without being professionals, may face a higher risk of exercise addiction compared to the general exercising population, where prevalence is about 3%. Studies show varying rates, with one finding 8.6% of amateur runners at risk (Lukács et al., 2019) and another reporting 12.7% among a broader group of 158 amateur athletes (Caru et al., 2022). These numbers highlight that exercise addiction is a notable issue, though exact figures can differ based on the study and sport type. EA can have

significant effects on amateur athletes, including increased pain and higher rates of injuries, with some continuing to exercise despite medical advice against it. Psychologically, it is often linked to anxiety, loneliness, and strained relationships, impacting personal and social life (Caru et al., 2022). Additionally, it frequently co-occurs with eating disorders (Ahorsu et al., 2023), which are also prevalent among athletes, adding to the complexity of managing this condition.

1.2 Statement of the Problem

Regular exercise is widely recognized for its benefits, including reducing the risk of chronic lifestyle diseases, enhancing physical health, and improving psychological, social, and mental well-being (Bushaman, 2020; Noseworthy et al., 2023). However, excessive dedication to exercise can lead to maladaptive behaviors, notably EA, a behavioral condition characterized by an unhealthy obsession with physical activity that persists despite negative consequences to physical, mental, and social health (Juwono et al., 2023; Lampe et al., 2023).

Among amateur athletes, who engage in sports for personal enjoyment or fitness without professional status, the prevalence of EA appears to be higher than in the general exercising population, with studies reporting rates ranging from 8.6% to 12.7% compared to approximately 3% in the broader population (Lukács et al., 2019; Caru et al., 2022). Despite these findings, the exact prevalence of EA among amateur athletes remains underexplored in the university setting and the full scope of its psychological, and social impacts is not fully understood, there are little or no studies on the prevalence of EA and its psychological (anxiety, depression), and social impact (social support) among a university population. This study aims to address these gaps by determining the prevalence of EA among amateur athletes in University of Benin and examining

its associated effects on their psychological well-being (anxiety, depression), and social functioning (social support).

1.3 Aim of study

To determine the prevalence of exercise addiction among amateur athletes in University of Benin and examining its associated effects on their physical health, psychological well-being and social functioning).

1.3.1 Specific Objectives

i. To determine the prevalence of EA among amateur athletes in University of Benin.

ii. To evaluate the psychological state (anxiety and depression) of amateur athletes with EA.

iii. To evaluate the social support is received by amateur athletes with EA.

iv. To determine the association between EA and psychological well-being (anxiety, depression) among amateur athletes in University of Benin.

v. To determine the association between EA and social support among amateur athletes in University of Benin.

1.4 Research Questions

i. What was the prevalence of EA among amateur athletes in the University of Benin?

ii. What was the psychological state (anxiety and depression) of amateur athletes with EA?

iii. What social support was received by amateur athletes with EA?

iv. What was the association between EA and psychological well-being (anxiety, depression) among amateur athletes in the University of Benin?

v. What was the association between EA and social support among amateur athletes in the University of Benin?

1.5 Hypothesis

1.5.1 Main Hypothesis

There will be no significant association between psychological well-being and social functioning with EA among amateur athletes at the University of Benin.

1.5.2 Sub hypotheses

i. There would be no significant association between exercise addiction psychological health (depression and anxiety) among amateur athletes at the University of Benin.

ii. There would be no significant association between exercise addiction and social functioning among amateur athletes at the University of Benin.

1.6 Significance of Study

i. To Athletes: This study raises awareness among amateur athletes about the risks and signs of exercise addiction, promoting healthier training habits and encouraging a balanced approach to fitness and performance.

ii. To the Sporting World: The findings can inform coaches, trainers, and sports organizations on how to identify and manage exercise addiction, leading to better support systems, policies, and athlete care practices.

iii. To the Literature: The study contributes valuable data on the prevalence and impact of exercise addiction, addressing a gap in behavioural health research among amateur athletes and enhancing the understanding of this emerging issue.

1.7 Delimitations of the Study

The study was delimited to female and male amateur athletes aged 18 years and above in University of Benin and will be delimited to the following instruments:

i. Exercise addiction inventory (EAI) to measure exercise addiction.

ii. Depression, Anxiety and Stress Scale (DASS-21) to assess depression, anxiety and stress.

iv. Social support questionnaire (SSQ) to assess social support.

1. 8 Limitations of the Study

1. **Causality Cannot Be Inferred (Cross-sectional Design):** The study used a cross-sectional design and so, this design can only establish that a relationship or association exists between exercise addiction and poor psychological well-being/low social support, and cannot prove cause and effect.
2. **Bias from Self-Report Measures:** All primary data was collected using standardized self-report questionnaires (EAI, DASS-21, SSQ). Responses are therefore inherently subjective and may be influenced by social desirability bias (participants may underreport addictive behavior or distress) or recall bias, which could skew the true prevalence and relationship findings.
3. **Limited Generalizability:** The sample was drawn exclusively from amateur athletes at the University of Benin, as such the findings may not be applicable to athletes in different

Nigerian universities, professional athletes, recreational exercisers, or international athletic populations, as environmental and cultural factors can influence exercise behaviors and social support structures.

4. **Selection Bias from Consecutive Sampling:** The study employed a consecutive (non-probability) sampling technique. Participants were recruited based on who is conveniently available, rather than random selection, increasing the risk of selection bias.
5. **Inability to Capture Fluctuations over Time:** Being a single-point-in-time assessment, the study does not account for changes in exercise addiction, distress, or social support over an athlete's career or training.

1.9 Definition of Terms

i. Exercise Addiction: EA is a behavioural condition characterized by an unhealthy obsession with physical activity, where an individual feels compelled to exercise excessively despite potential harm to their physical health, mental well-being, or social life (Juwono et al., 2023).

ii. Amateur athletes: Amateur athletes are individuals who engage in sports or physical activities primarily for personal enjoyment, health, recreation, or competition without receiving significant financial compensation or professional status (Lukács et al., 2019).

iii. Psychological well-being: The World Health Organisation defines psychological well-being as, "a state of mind in which an individual is able to develop their potential, work productively and creatively, and is able to cope with the normal stresses of life" (WHO, 2021).

iv. Social Support: Social support within the scope of both structural and functional frameworks, is described as functional qualitative aspects of social interactions or human relationship (Haugan & Eriksson, 2021).

1.6 List of Abbreviations

EA – Exercise Addiction

CHAPTER TWO

LITERATURE REVIEW

2.1 Exercise

Exercise refers to planned, structured, and repetitive physical activities that aim to improve overall health and maintain physical fitness (Morgan and Ellickson, 2021). Exercise is a vital component of a healthy lifestyle, contributing significantly to physical, mental, and emotional well-being. It encompasses a wide range of physical activities, including walking, running, strength training, yoga, and sports, all aimed at improving or maintaining fitness (Kenney et al., 2022). Regular exercise helps strengthen the cardiovascular system, build muscular strength and endurance, improve flexibility, and support weight management (Thompson et al., 2020). Beyond physical benefits, it has been shown to reduce stress, boost mood, and enhance cognitive function through the release of endorphins and other neurochemicals. In both preventive and therapeutic contexts, exercise plays a key role in reducing the risk of chronic diseases such as obesity, diabetes, hypertension, and depression. As modern lifestyles become increasingly sedentary, incorporating regular physical activity into daily routines is essential for maintaining overall health and enhancing quality of life (Gibson et al., 2024). It involves expending energy to help patients prevent impairments, restore physical function, and reduce health-related risk factors. By engaging in exercise, patients can optimize their overall health status, fitness levels, and sense of well-being.

2.1.1 Benefits of Physical Exercise

Engaging in regular exercise offers a wide range of benefits for both physical and mental well-being. Here are some key benefits of physical activity:

i. Improved Cardiovascular Health: regular exercise helps improve cardiovascular fitness, lowers the risk of heart disease, and reduces the risk of stroke (bushman, 2020). regular exercise can help lower the risk of developing heart disease. it can improve heart muscle strength, enhance blood circulation, and promote healthier cholesterol and blood pressure levels, all of which contribute to a healthier heart (WHO, 2022).

ii. Weight Management: Exercise plays a vital role in weight maintenance and helps in preventing excess weight gain. It can also assist in weight loss when combined with a balanced diet (Bellicha et al., 2021).

iii. Improved Mental Health: Exercise is associated with a reduced risk of depression and anxiety and can enhance overall mental well-being (Smith and Merwin, 2021). Exercise can help to reduce symptoms of anxiety and depression, boost mood, and improve cognitive function. Although the exact relationship between physical activity and mental health may not be fully understood, previous research consistently demonstrates that physical activity has beneficial effects on overall mental well-being. Multiple studies have concluded that engaging in regular physical activity positively impacts general mental health (Smith and Merwin, 2021; Herbert et al., 2020).

iv. Enhanced Bone Health: Weight-bearing and resistance exercises help improve bone density and reduce the risk of osteoporosis and fractures (Chang and Zhang, 2022). The National Osteoporosis Foundation recommends weight-bearing exercises and muscle-strengthening exercises as key components of a comprehensive approach to improving bone health and reducing the risk of fractures. They highlight the importance of engaging in activities such as walking, jogging, stair climbing, weightlifting, and yoga to promote bone strength and density.

v. Reduced Risk of Chronic Diseases: Regular physical activity contributes to a lower risk of chronic conditions such as type 2 diabetes, certain cancers (e.g., breast and colon cancer), and metabolic syndrome (Bushman, 2020).

vi. Enhancing quality of life: Regular physical activity can improve overall quality of life by promoting social interaction, reducing stress, and increasing self-esteem (Codman et al., 2021). Codman et al. (2021) conducted a comprehensive review of literature exploring the relationship between physical activity and quality of life in older adults. They found consistent evidence supporting the positive impact of physical activity on various aspect of quality of life, including physical functioning, emotional well-being, social functioning, and overall life satisfaction

These health benefits are well-documented and underscore the importance of incorporating physical activity into daily life (Valenzuela et al, 2020).

2.1.3 Type of Exercises

According to the Centers for Disease Control and Prevention (CDC), physical activity can be classified into four main categories:

i. Aerobic exercises: Aerobic activities are exercises that increase your heart rate and breathing rate. They involve continuous movement of large muscle groups and help improve cardiovascular fitness. Examples of aerobic exercises include brisk walking, running, cycling, swimming, dancing, and aerobic classes. Engaging in aerobic activities regularly can improve heart and lung function, boost endurance, and contribute to overall cardiovascular health.

ii. Muscle strengthening activities: Muscle strengthening exercises focus on building and strengthening your muscles. These activities typically involve resistance or weight-

bearing exercises that target muscle groups. Bone strengthening exercises target bone health. These activities promote the growth and development of strong and healthy bones, reducing the risk of osteoporosis and fractures (Bushman et al., 2020). Examples include lifting weights, using resistance bands, doing bodyweight exercises (like push-ups and squats), and using weight machines.

iii. Flexibility activities: Flexibility exercises improve your joint mobility and muscle flexibility. They involve stretching and lengthening the muscles to enhance range of motion (Fan *et al.*, 2024). Examples of flexibility activities include static stretching, yoga, Pilates, and tai chi. Regular flexibility exercises can help improve posture, prevent muscle imbalances, reduce the risk of injuries, and increase overall flexibility and mobility.

iv. Balance activities: These exercises help improve balance, stability, and coordination, reducing the risk of falls and related injuries, especially in older adults (Papila et al., 2021). Balance activities can include standing on one leg, heel-to-toe walking, tai chi, yoga poses that challenge balance and using balance boards or stability balls.

2.1.4 Exercises for Athletes

Regular exercise is essential for optimizing athletic performance, with different forms of training targeting specific aspects of fitness. Strength training remains foundational for athletes, improving muscular power, endurance, and overall performance. According to Alfonso et al. (2021), enhanced muscular strength contributes significantly to athletic output and resilience against injury. Plyometric training, which involves explosive movements like jump squats and box jumps, has also gained prominence. Luo et al. (2022) found that plyometric exercises significantly improve speed, agility, and jumping ability in team sport athletes. Core stability

training is another vital component, especially for enhancing balance and preventing injuries. Luo et al. (2022) demonstrated that consistent core exercises lead to improved coordination and postural control in youth athletes. Speed and agility drills, including shuttle runs and ladder drills, are essential for sports requiring quick directional changes. Akbar et al. (2022) emphasized that these drills enhance neuromuscular coordination and reaction time. Lastly, flexibility and mobility work, such as dynamic stretching and foam rolling, play a crucial role in recovery and injury prevention. Lee et al. (2024) reported that such practices support improved range of motion and faster post-exercise recovery. Collectively, these exercises form a comprehensive approach to athletic conditioning.

2.2 Exercise Addiction (EA)

Exercise Addiction (EA) is a behavioral condition characterized by an unhealthy obsession with physical exercise, leading to physical, psychological, and social impairments (Trott et al., 2021). Individuals with EA often feel compelled to engage in excessive exercise despite injury, illness, or adverse consequences in personal and professional life. While regular physical activity is beneficial for health, EA involves a loss of control, where exercise becomes a compulsion rather than a choice (Weinstein and Szabo, 2021). It is commonly linked with psychological factors such as low self-esteem, perfectionism, and body image concerns, and is often associated with other disorders like eating disorders and anxiety.

EA is typically classified as either primary where the addiction exists independently or secondary, when it co-occurs with eating disorders or other psychopathologies (Juwono et al., 2022). Warning signs include training through pain, social withdrawal, and prioritizing exercise over other essential activities. Physiologically, this behavior may lead to overtraining syndrome, chronic fatigue, and increased injury risk. Psychologically, it can contribute to mood

disturbances and emotional instability. Raising awareness and promoting balanced exercise habits are crucial to preventing this hidden form of addiction.

2.2.1 Prevalence of Exercise Addiction Among Athletes

Exercise addiction (EA) has garnered increasing attention among amateur athletes, who, despite not competing professionally, often engage in rigorous training for personal fitness or enjoyment. While the general prevalence of EA in the exercising population is estimated at around 3%, evidence suggests that amateur athletes may be at a higher risk. Lukács et al. (2019) found that 8.6% of amateur runners were at risk of exercise addiction, indicating a substantial deviation from general population estimates. Similarly, Caru et al. (2022) reported a higher prevalence rate of 12.7% among a broader group of 158 amateur athletes. These findings underscore that, although exercise is often pursued for health and well-being, a significant minority may develop maladaptive patterns of physical activity. Differences in reported prevalence rates can be attributed to various factors, including the type of sport, training intensity, and the assessment tools used. Overall, these studies suggest that exercise addiction is a noteworthy concern among amateur athletes and warrants greater attention in both research and preventive interventions.

2.2.2 Symptoms of Exercise Addiction Among Athletes

Exercise addiction (EA) can be particularly difficult to identify in athletes due to the high training demands of competitive sports. However, when exercise behavior becomes compulsive and detrimental, several symptoms may signal the presence of EA. These include:

i. Loss of Control: Inability to reduce or stop exercising despite physical pain, fatigue, or injury.

ii. Withdrawal Symptoms: Experiencing irritability, anxiety, guilt, or depression when unable to exercise.

iii. Tolerance: Needing to increase the intensity, frequency, or duration of exercise to achieve the same psychological effect.

iv. Time Investment: Spending an excessive amount of time preparing for, engaging in, and recovering from exercise.

v. Conflict: Neglecting personal, academic, or professional responsibilities due to a preoccupation with exercise; straining social and family relationships.

vi. Continuance Despite Harm: Persisting in exercise routines even when advised by health professionals to rest or when injuries worsen.

vii. Exercise as a Coping Mechanism: Relying on exercise to manage emotions such as stress, sadness, or anger.

Among athletes, these symptoms are often masked by a culture that values discipline and extreme training, making early identification and intervention crucial (Juwono et al., 2022; Dinardi et al., 2022)

2.2.3 Side Effects of Exercise Addiction (EA)

1. Physical Health Problems

Individuals addicted to exercise often push their bodies beyond safe limits, leading to overuse injuries such as stress fractures, tendinitis, and joint or muscle strain. These injuries result from inadequate rest and recovery time. Women may experience hormonal imbalances, such as the female athlete triad a condition involving disordered eating, menstrual dysfunction (amenorrhea), and low bone density. Additionally, overtraining syndrome, a state of persistent fatigue, poor

performance, and increased injury risk can set in due to the body's inability to fully recover between sessions.

2. Mental Health Issues

Exercise addiction is frequently linked to psychological distress. Individuals may rely on exercise to cope with anxiety, low self-esteem, or depression, developing an unhealthy dependence. When prevented from exercising (e.g., due to injury or schedule changes), they may experience withdrawal symptoms such as irritability, anxiety, restlessness, or even guilt. These emotional symptoms resemble those seen in substance use disorders, highlighting the compulsive nature of EA.

3. Social Withdrawal

As the individual's focus shifts increasingly toward exercise, other aspects of life like social relationships, hobbies, and even work or school are neglected. Athletes or exercisers may skip important events or avoid social outings to maintain their workout schedule, leading to isolation and strained relationships. Over time, this can significantly impair quality of life and emotional well-being.

4. Sleep Disturbances

Exercising excessively or at odd hours (especially late at night) can disrupt the body’s natural circadian rhythm, making it harder to fall or stay asleep. Overtraining may also elevate stress hormones like cortisol, which interfere with deep rest. This poor sleep quality then further impairs recovery, increases fatigue, and contributes to a vicious cycle of stress and underperformance.

5. Nutritional Deficiencies

Exercise addiction may coexist with disordered eating, especially among those striving for weight loss or a certain physique. Individuals might restrict calorie intake while maintaining high activity levels, leading to low energy availability. This imbalance can cause fatigue, reduced immunity, menstrual issues, and even organ damage over time. Nutritional deficiencies in calcium, iron, and vitamin D are common, increasing the risk of osteoporosis and anemia.

6. Increased Risk of Burnout

Without proper rest and mental balance, overtraining can lead to burnout, a state of physical and emotional exhaustion marked by decreased motivation, enthusiasm, and performance. Athletes may feel disconnected from their goals or develop a negative attitude toward their sport or training. This often results in withdrawal from exercise altogether, further compounding mental health challenges

2.2.4 Exercise addiction and affective components

Exercise addiction (EA) is closely intertwined with affective components (emotions, mood states, and psychological responses to exercise). These affective elements not only contribute to the development of EA but also maintain addictive behavior over time.

One of the key affective drivers of exercise addiction is the mood-enhancing effect of physical activity. Exercise stimulates the release of endorphins, dopamine, and serotonin—neurotransmitters associated with pleasure, reward, and stress relief. For many individuals, especially athletes, these positive feelings reinforce the desire to exercise repeatedly (Palfi et al., 2021). Over time, some become emotionally dependent on these effects, using exercise as a primary tool to regulate negative emotions such as stress, anxiety, loneliness, or depression.

Research suggests that individuals at risk of EA often experience negative affect (e.g., irritability, guilt, or tension) when they are unable to exercise, indicating a withdrawal-like response similar to substance use disorders (Alcaraz-Ibáñez et al., 2022). This emotional discomfort can drive compulsive exercise behavior, as individuals seek to avoid unpleasant mood states and regain a sense of emotional stability through physical activity.

Moreover, low self-esteem, body dissatisfaction, and perfectionism are psychological traits frequently observed in those with EA. These traits are affectively charged and often push individuals to overtrain in pursuit of an ideal body image or performance standard (Zhang et al., 2024). In essence, affective components both positive (e.g., mood enhancement, sense of accomplishment) and negative (e.g., fear of weight gain, anxiety, guilt) play a central role in the initiation, reinforcement, and persistence of exercise addiction.

2.3 Amateur Athletes

The amateur athlete population is a key demographic in sports psychology research, particularly when investigating health behaviours and potential maladaptations such as exercise addiction. Unlike the professional who derives their primary income from their sport, the amateur engages in structured training and competition out of personal commitment, passion, and a desire for achievement (Ryan & Deci, 2001). This commitment often involves balancing athletic pursuits with academic or occupational responsibilities, which introduces a unique layer of stress and time constraint. In a university setting, amateur athletes are constantly negotiating the demands of high-level competition with rigorous study, creating an environment that may either foster resilience or expose vulnerability to excessive behaviours.

2.3.2 Training Characteristics and Performance Demands in Amateur Sports

The training for student athletes in Nigerian universities is often intense and very structured, similar to what professionals do but in less time. This often means frequent, heavy training to get ready for university competitions. These athletes also have to handle schoolwork, deadlines, and tests, which takes up a lot of time and can cause stress. The pressure to do well comes from coaches, the university, and the desire to win, which can lead to future sports chances (Awotidebe et al., 2014). In this setting, where self-worth can be tied to athletic success, obsessive exercise can easily develop.

2.3.3 The Risk and Prevalence of Exercise Addiction Among Amateur Athletes

Research consistently indicates that athletes, including amateurs, exhibit a higher prevalence of exercise addiction compared to the general population (Sussman, Lisha, & Griffiths, 2011). This increased risk can be due to tough training, seeing oneself as an athlete, and constant pressure to achieve. In Nigerian universities, things like few resources, not enough recovery options, and a strong focus on sports success can worsen this risk. The strong need to train, even when hurt or sick, becomes a poor way to deal with stress, maintain self-esteem, and meet expectations, which raises the chance of becoming addicted to exercise.

2.4 Exercise Addiction and Psychological Wellbeing

2.4.1 Conceptualizing Psychological Wellbeing in the Context of Sport

Within the sporting context, psychological wellbeing extends beyond the mere absence of illness. It encompasses a state wherein an individual realises their own abilities, can cope with the normal stresses of athletic life, can work productively and fruitfully, and is able to make a contribution to their team and community (Keyes, 2002). For the student-athlete, this includes positive affect, satisfaction with sport-academic life balance, resilience in the face of performance setbacks, and a stable sense of self-worth that is not entirely contingent upon athletic success. It is a holistic state that is crucial for both sustainable performance and long-term health.

2.4.2 The Theoretical Link Between Compulsive Exercise and Psychological Distress

The relationship between compulsive exercise and psychological distress is often explained by several theoretical models. The *'Symbiotic Model'* proposed by Adams, Kirkby, and Baylle (2003) suggests that exercise addiction and eating disorders can co-occur and reinforce one another, with exercise being used as a purging behaviour. Furthermore, the *Addiction Model* suggests that exercise can trigger the release of endorphins, creating a natural "high" that individuals may become dependent upon to regulate mood (Freimuth, Moniz, & Kim, 2011). When deprived of exercise, they may experience withdrawal symptoms, including anxiety and depression, thereby perpetuating a cycle of compulsive behaviour to avoid psychological distress.

2.4.3 Association between Exercise Addiction and Anxiety

A robust body of evidence links exercise addiction with heightened anxiety. For the amateur athlete, exercise may initially be employed as an adaptive strategy to reduce anxiety. However, when this behaviour becomes compulsive, it can paradoxically increase anxiety levels. The individual may experience intense anxiety, irritability, and guilt when unable to exercise (Freimuth et al., 2011). This is particularly pertinent for student-athletes who face academic pressures that can conflict with their training schedules, creating a constant source of stress and worry about missing sessions, thereby fuelling the addictive cycle.

2.4.4 Association between Exercise Addiction and Depression

The association with depression is complex and often bidirectional. Whilst moderate exercise is a well-established intervention for mild to moderate depression, compulsive exercise can be a symptom of underlying depressive disorders or a maladaptive attempt to self-medicate (Weinstein & Weinstein, 2014). The relentless pursuit of exercise can lead to physical burnout and chronic fatigue, which are somatic symptoms associated with depression. Moreover, the social isolation and interpersonal conflicts that often accompany exercise addiction can erode social support networks, a key protective factor against depression, thereby deepening the individual's psychological distress (Szabo, 2022).

2.5 The Role of Social Support in Exercise Addiction

2.5.1 Defining Social Support in the Context of Athletics

In athletics, social support refers to the perceived or actual provision of emotional, informational, and tangible assistance from an individual's social network (Katagami *et al.*, 2017). This network typically includes coaches, teammates, friends, family, and university staff. Emotional support

involves expressions of empathy and caring; informational support includes advice and guidance on training and performance; and tangible support involves practical assistance, such as help with logistics or academic work. For a student-athlete, a strong support system is vital for navigating the challenges of their dual career.

2.5.2 The Impact of Exercise Addiction on Social Functioning and Relationships

Exercise addiction frequently has a deleterious effect on social functioning. The excessive time dedicated to training can lead to the neglect of social and academic responsibilities, resulting in withdrawal from friends and family (Szabo, 2022). The individual's singular focus on exercise can make them less available and emotionally present in relationships, causing strain and conflict. Teammates and coaches, who may initially encourage dedication, might later perceive the behaviour as obsessive and disruptive to team cohesion, leading to social rejection and further isolation for the addicted athlete.

2.5.3 Social Support as a Protective Factor Against Exercise Addiction

A strong and multi-source social support system can act as a significant protective factor against the development of exercise addiction. Supportive relationships can provide alternative sources of self-esteem and identity beyond athletic performance (Katagami *et al.*, 2017). For instance, a coach who emphasises holistic wellbeing over winning at all costs, or friends who encourage social activities unrelated to sport, can help maintain a balanced perspective. This support can buffer against the psychological distress that often underpins addictive exercise, providing healthier coping mechanisms and reducing the reliance on exercise for mood regulation.

2.5.4 The Influence of Social Environments on Exercise Habits

The social environment, particularly the team culture and coaching philosophy, profoundly influences exercise habits. A highly pressurised environment that glorifies "no pain, no gain" and stigmatises rest can normalise and even reward compulsive exercise behaviours (Cresswell & Eklund, 2006). Conversely, a supportive environment that promotes balanced training, adequate recovery, and open communication about wellbeing can foster healthier attitudes towards exercise. For Nigerian university athletes, the institutional culture of their sports department and the attitudes of their immediate peers and coaches are critical in either mitigating or exacerbating the risk of exercise addiction.

2.6 Empirical literature review on exercise addiction and its affective components

Author	Type of Study	Sample Size	Aim	Outcome Measures	Results	Conclusion
Antunes et al. (2016)	Experimental (withdrawal study)	18 male runners (10 controls, 8 with exercise addiction)	To identify the association between biochemical markers of exercise addiction and affective parameters during 2 weeks of exercise withdrawal.	Affective questionnaires, blood samples (anandamide, β-endorphin), body composition, aerobic test	Exercise addiction group showed increased depression, confusion, anger, fatigue, and decreased vigor post-withdrawal; low anandamide levels	2-week exercise withdrawal increased negative mood in exercise addiction group; associated with low anandamide levels
Haakstad et al. (2018)	Cross-sectional	1083 recreational exercisers (injured and non-injured)	To investigate the association between risk of exercise addiction and psychological	Depression (Major Depression Inventory), emotional stress (Perceived Stress Scale)	More HREA exercisers were depressed and stressed; exacerbated by injury	HREA associated with more depression and stress, worse with injury

			distress, modified by injury status			
McNamara & McCabe (2012)	Examination of exercise dependence using a biopsychosocial model	234 elite Australian athletes	To validate a biopsychosocial model explaining exercise dependence in elite athletes	Exercise dependence classification, body mass index, exercise beliefs, pressure from coaches/teammates, social support	34% of elite athletes (79 athletes) were classified as exercise dependent; they had higher BMI, maladaptive exercise beliefs, higher pressure from coaches/teammates, and lower social support.	Supports the biopsychosocial model for understanding exercise dependence; highlights the role of social support.
Modolo et al. (2011)	Comparison between genders using questionnaires	144 females, 156 males	To determine gender differences in negative addiction symptoms, quality of life, mood, and sleep among athletes	Negative Addiction Scale, Beck Depression Inventory, Trait Anxiety Inventory, Profile of Mood States, SF-36 Quality of Life, Pittsburgh Sleep Quality, Epworth Sleepiness Scale	Females with negative addiction symptoms showed lower vigor and higher depression than males; no gender differences in addiction development.	No gender differences in exercise addiction development; females may experience greater mood disturbances
Vladimir Bonilha	Cross-sectional	300 athletes	To determine	Negative Addiction	Females with negative	No gender differences

Modolo et al. (2011)		(144 females, 156 males)	gender differences in negative addiction symptoms, quality of life, mood, and sleep	Scale, Beck Depression Inventory, Trait Anxiety Inventory, Profile of Mood States, SF-36, Pittsburgh Sleep Quality, Epworth Sleepiness Scale	addiction showed lower vigor; both genders had depression symptoms, higher in females	in negative addiction development; suggests further studies on eating disorders and body image
Weinstein et al. (2015)	Observational study using questionnaires	71 participants (20 professional, 51 recreational)	To explore the association between exercise addiction, anxiety, and depression in professional and recreational exercisers	Beck Depression Inventory (BDI), Spielberger State-Trait Anxiety Inventory (STAI), Compulsive Exercise Scale (CES)	Compulsive exercise was associated with anxiety and depression in both groups. Professional exercisers showed higher depression (mean BDI 30.65 vs 26.82, $F(2,92)=3.12$, $p<0.05$) and compulsive exercise scores than recreational exercisers.	High depression levels suggest a need for psychological support; further research is needed on exercise as mood enhancement.

Table 2.1: Empirical Table

CHAPTER THREE

MATERIALS AND METHODS

3.1 Materials

3.1.1 Population

The population of this study includes both male and female undergraduate students at the University of Benin, Benin City, who participate in various sporting events including basketball, volleyball, football, track events within the university.

3.1.2 Selection Criteria

3.1.2.1 Inclusion Criteria

i. Full time undergraduates in University of Benin within the age range of 18 years and above.

ii. Participants must be actively participating in sport activities for at least one year in the university.

iii. Participants must provide informed consent to participate in the study.

iv. Participants must be at least in their second year (200 level) in the university.

3.1.2.2 Exclusion Criteria

i. Athletes who compete at a professional level outside of university competitions.

ii. Students with pre-existing chronic musculoskeletal conditions not related to sports activities.

iii. Students who do not participate in any organized sports activities.

iv. Students who do not provide informed consent.

3.1.3 List of Instruments

The following materials were used in this study:

i. Exercise Addiction Inventory (EAI)

ii. Depression, anxiety and stress scales (DASS-21)

iii. Multidimensional Scale of Perceived Social Support for social support (MSPSS):

3.1.4 Description of instruments

i. **Exercise Addiction Inventory (EAI):** The Exercise Addiction Inventory (EAI) is a brief, 6-item screening tool developed to identify individuals at risk of exercise addiction—a behavioral addiction characterized by an unhealthy obsession with physical exercise, often leading to negative physical, psychological, and social consequences. It was developed by Terry et al. (2004) to assess symptoms of exercise addiction based on the components of behavioral addiction (salience, mood modification, tolerance, withdrawal, conflict, and relapse). The Exercise Addiction Inventory (EAI) consists of 6 items, each rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), yielding a total score between 6 and 30. Interpretation of the scores follows a tiered approach: a score of 24 or above indicates a potential risk of exercise addiction, scores between 13 and 23 suggest the individual may exhibit symptoms but is not necessarily addicted, while scores of 12 or below reflects asymptomatic behavior. The Exercise Addiction Inventory (EAI) demonstrates solid psychometric properties. Its internal consistency is acceptable to good, with Cronbach's alpha values ranging from 0.70 to 0.86 (Terry et al., 2004; Szabo, 2021). The EAI also shows strong concurrent validity, evidenced by positive correlations with related measures such as the Obligatory Exercise Questionnaire (OEQ) and the Exercise Dependence Scale (EDS), with correlation coefficients ranging from $r = 0.65$ to 0.76. Additionally, the EAI has shown good test-retest reliability, with stability coefficients such as $r = 0.79$ over a two-week interval, indicating that scores remain consistent over time (Terry et al., 2004; Gori et al., 2021).

ii. **Depression, anxiety and stress scales (DASS-21):** DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. The DASS-21 is a shortened version of the original 42-item scale and is widely used in both clinical and research settings due to its efficiency and reliability. The psychometric properties of the 21-item version of the DASS-21 were evaluated among a sample of medical students in Lagos, Nigeria (Coker *et al.*, 2018). The reliability of the DASS-21, assessed using Cronbach's alpha, demonstrated subscale values of $\alpha = 0.81$ for depression, $\alpha = 0.89$ for anxiety, and $\alpha = 0.78$ for stress (Coker *et al.*, 2018). These Cronbach's alpha values indicate that the DASS-21 is a reliable psychometric instrument with good internal consistency across its subscales. The DASS-21 shows good convergent validity, as its subscales correlate highly with other established measures of depression, anxiety, and stress, such as the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI) (Moya *et al.*, 2022).

iii. **Multidimensional Scale of Perceived Social Support for social support (MSPSS):** This is widely used to assess individuals' perceptions of the social support they receive from their family and friends. The MSPSS has shown high internal consistency in various studies. Cronbach's alpha values for the family subscale typically range from 0.85 to 0.92, and for the friend's subscale, they range from 0.87 to 0.97, indicating that the items within each subscale are highly correlated and measure a cohesive construct of perceived social support from family and friends (Osman *et al.*, 2014). Previous research utilized this tool to examine the factors of social support among university students and to explore how these factors influence their engagement in physical activity (PA) (McNally *et al.*, 2021). The MSPSS scores are interpreted based on mean values: scores from 1.0 to 2.9 indicate low social support, 3.0 to 5.0 reflect moderate support, and 5.1 to 7.0 indicate high perceived support. This helps assess

how much emotional and practical support individuals feel they receive from family, friends, and significant others.

3.2 Methods

3.2.1 Research Design

A cross-sectional study design was used for this study.

3.2.2 Sampling Technique

Consecutive sampling techniques were used in recruiting participants for this study.

3.2.3 Sample Size

Sample size was calculated using the formula.

$n=N / (1+N[e]^2)$ (Slovin's Formula) (Anugraheni et al., 2023)

where:

n is the sample size, N is the population size, e is the margin of error

n is the sample size, N is the population size, e is the margin of error = 0.065

n=45,000 (University of Benin Student population according to Uniben.edu.ng)

$n=45,000 / (1+45,000[0.05]^2)$

n= 396 participants

3.2.4 Ethical consideration (CMS/REC/2024/822) - Appendix E

Ethical approval (CMS/REC/2024/822) was obtained from the Research Ethical Committee of College of Medical Sciences before the commencement of this study (Appendix E). Students was properly informed about the purpose of the study, participation was voluntary, and a written informed consent was signed, before research study.

3.2.5 Procedure for data collection

Participants for this study were recruited from the sports complex of the University of Benin. Individuals were approached in person, and those who expressed interest were assessed against the predefined inclusion criteria. Upon confirmation of their eligibility, informed consent was obtained, and participants were thoroughly briefed on the purpose, procedures, and expectations of the study. Eligible participants were provided with a set of standardized questionnaires to complete, including the Exercise Addiction Inventory (EAI), the Depression, Anxiety, and Stress Scales (DASS-21), and the Multidimensional Scale of Perceived Social Support (MSPSS). These instruments were self-administered in a quiet and private setting within the sports complex to ensure comfort and minimize distractions. The researcher was available to provide any necessary information, and the questionnaire was collected on the same day.

3.2.6 Data analysis

The data was analysed using the International Business Machine (IBM) Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics of frequency and percentages were used to summarize participant's socio-demographic variables (gender, age, department and level, and sporting related factors), EA. Inferential statistics of Pearson's Chi square were used to determine the association between EA and each of the psychological variables (depression and anxiety) and social support at $p < 0.05$.

CHAPTER FOUR

RESULTS

4..1 Sociodemographic characteristics of the respondents

The sample comprised 60.0% males (Table 4.2) and 40.0% females (Table 4.2). Most participants were aged 18–25 years (44.0%) (Table 4.2), followed by 25–32 years (32.0%) (Table 4.2), 32–40 years (16.0%) (Table 4.2), and ≥40 years (8.0%) (Table 4.2). Students were distributed across academic levels, with the largest proportions in 300 (24.0%) (Table 4.2) and 400 levels (22.0%) (Table 4.2). The majority were single (74.0%) (Table 4.2), with 24.0% married (Table 4.2) and 2.0% divorced (Table 4.2). The most common sport was football (52.0%) (Table 4.2), followed by sprint (28.0%) (Table 4.2) and basketball (20.0%) (Table 4.2). Over one-third reported a prior sports-related injury (36.0%) (Table 4.2). Regarding participation frequency, 24.0% exercised daily (Table 4.2), 40.0% exercised 1–2 times per week (Table 4.2), and 36.0% exercised 3–4 times per week (Table 4.2).

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	35	60.0
	Female	25	40.0
Age	18–25	27	44.0
	25–32	21	32.0
	32–40	8	16.0
	40 and above	4	8.0
Level	100	6	10.0
	200	9	16.0
	300	14	24.0
	400	10	22.0
	500	9	18.0
	600	5	10.0
Marital status	Single	47	74.0
	Married	12	24.0
	Divorced	1	2.0
Type of sports	Football	26	52.0
	Basketball	10	20.0
	Sprint	14	28.0
Prior injury	Yes	18	36.0
	No	32	64.0
Frequency of sporting activities	Daily	12	24.0
	1–2/week	20	40.0
	3–4/week	18	36.0

Table 4.2: Sociodemographic characteristics of the respondents

4.1.2 : Exercise Addcition among the respondents

Table 4.3 shows the distribution of responses to the six items of the Exercise Addiction Inventory among the respondents.

For the statement “Exercise is the most important thing in my life,” 25 (50%) (Table 4.3) respondents selected Neutral, 11 (22%) Agreed (Table 4.3), and 4 (8%) Strongly Agreed (Table 4.3), while 5 (10%) (Table 4.3) each Strongly Disagreed and Disagreed. For “Conflicts have arisen between me and my family or partner about the amount of exercise I do,” 18 (36%) Strongly Disagreed (Table 4.3) and 19 (38%) Disagreed (Table 4.3), while 9 (18%) were Neutral (Table 4.3), 3 (6%) Agreed (Table 4.3), and 1 (2%) Strongly Agreed (Table 4.3).

Regarding “I use exercise as a way of changing my mood (e.g., to get a buzz or escape),” 7 (14%) Strongly Disagreed (Table 4.3), 12 (24%) Disagreed (Table 4.3), 14 (28%) were Neutral (Table 4.3), 13 (26%) Agreed (Table 4.3), and 4 (8%) Strongly Agreed (Table 4.3). For “Over time I have increased the amount of exercise I do in a day,” 9 (18%) Strongly Disagreed (Table 4.3), 15 (30%) Disagreed (Table 3), 9 (18%) were Neutral (Table 4.3), 13 (26%) Agreed (Table 4.3), and 4 (8%) Strongly Agreed (Table 4.3). This indicates that most participants maintained moderate and consistent exercise routines, with some reporting gradual increases.

Concerning “If I have to miss an exercise session, I feel moody and irritable,” 11 (22%) Strongly Disagreed (Table 4.3), 21 (42%) Disagreed (Table 4.3), 11 (22%) were Neutral (Table 4.3), and 7 (14%) Agreed (Table 4.3), while no respondents Strongly Agreed. Finally, for “If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as before,” 8 (16%) Strongly Disagreed (Table 4.3), 14 (28%) Disagreed (Table 4.3), 11 (22%) were Neutral(Table 4.3), 11 (22%) Agreed (Table 4.3), and 6 (12%) Strongly Agreed (Table 4.3).

Table 4.3: Exercise Addiction among the respondents

EAI Item	**Strongly Disagree** n (%)	**Disagree** n (%)	**Neutral** n (%)	**Agree** n (%)	**Strongly Agree** n (%)
1. Exercise is the most important thing in my life.	5 (10%)	5 (10%)	25 (50%)	11 (22%)	4 (8%)
2. Conflicts have arisen between me and my family or partner about the amount of exercise I do.	18 (36%)	19 (38%)	9 (18%)	3 (6%)	1 (2%)
3. I use exercise as a way of changing my mood (e.g., to get a buzz or escape).	7 (14%)	12 (24%)	14 (28%)	13 (26%)	4 (8%)
4. Over time I have increased the amount of exercise I do in a day.	9 (18%)	15 (30%)	9 (18%)	13 (26%)	4 (8%)
5. If I have to miss an exercise session, I feel moody and irritable.	11 (22%)	21 (42%)	11 (22%)	7 (14%)	–
6. If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as before.	8 (16%)	14 (28%)	11 (22%)	11 (22%)	6 (12%)

4.1.3 Depression, Anxiety and Stress among the respondents

Table 4.4 presents respondents' distribution across the DASS-21 items. For the statement "I found it hard to wind down," 21 (42%) respondents selected None (Table 4.4) and another 21 (42%) selected Some extent (Table 4.4), suggesting that most participants experienced minimal difficulty relaxing. Similarly, "I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)" recorded 21 (42%) None (Table 4.4) and 21 (42%) Some extent (Table 4.4), reinforcing low anxiety symptoms. The highest frequencies for "I tended to over-react to situations" 20 (40%) = None (Table 4.4), "I worried about situations in which I might panic and make a fool of myself" 20 (40%) = Some extent (Table 4.4), and "I found myself getting agitated" 21 (42%) = None (Table 4.4) all reflected limited stress responses.

Indicators of depressive symptoms were similarly low. For example, "I felt that I had nothing to look forward to" 24 (48%) = None (Table 4.4), "I felt down-hearted and blue" 24 (48%) = None (Table 4.4), and "I was unable to become enthusiastic about anything" 22 (44%) = None (Table 4.4), showing that most respondents did not experience persistent sadness or loss of interest.

Physiological anxiety symptoms were rare, as seen in "I was aware of the action of my heart in the absence of physical exertion" 25 (50%) = None (Table 4.4) and "I felt scared without any good reason" 27 (54%) = None (Table 4.4), suggesting few respondents experienced somatic anxiety. Items such as "I found it difficult to relax" 20 (40%) = Some extent (Table 4.4) and "I was intolerant of anything that kept me from getting on with what I was doing" 16 (32%) = Some extent / Considerable (Table 4.4) demonstrated more balanced response distributions, indicating that a small subgroup experienced moderate situational stress.

Table 4.4: Depression, Anxiety and Stress among the respondents

DASS-21 Item	None n (%)	Some extent n (%)	Considerable n (%)	Most time n (%)
1. I found it hard to wind down.	21 (42%)	21 (42%)	6 (12%)	2 (4%)
2. My mouth felt dry.	7 (14%)	5 (10%)	8 (16%)	7 (14%)
3. I couldn't seem to experience any positive feeling at all.	4 (8%)	7 (14%)	7 (14%)	8 (16%)
4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	21 (42%)	21 (42%)	6 (12%)	2 (4%)
5. I found it difficult to work up the initiative to do things.	18 (36%)	14 (28%)	13 (26%)	5 (10%)
6. I tended to over-react to situations.	20 (40%)	13 (26%)	10 (20%)	7 (14%)
7. I experienced trembling (e.g., in the hands).	24 (48%)	15 (30%)	7 (14%)	4 (8%)
8. I felt that I was using a lot of nervous energy.	15 (30%)	18 (36%)	10 (20%)	7 (14%)
9. I worried about situations in which I might panic and make a fool of myself.	19 (38%)	20 (40%)	5 (10%)	6 (12%)
10. I felt that I had nothing to look forward to.	24 (48%)	11 (22%)	10 (20%)	5 (10%)
11. I found myself getting agitated.	21 (42%)	16 (32%)	10 (20%)	3 (6%)
12. I found it difficult to relax.	12 (24%)	20 (40%)	11 (22%)	7 (14%)
13. I felt down-hearted and blue.	24 (48%)	11 (22%)	12 (24%)	3 (6%)
14. I was intolerant of anything that kept me from getting on with what I was doing.	13 (26%)	16 (32%)	16 (32%)	5 (10%)
15. I felt I was close to panic.	22 (44%)	13 (26%)	10 (20%)	5 (10%)
16. I was unable to become enthusiastic about anything.	22 (44%)	19 (38%)	6 (12%)	3 (6%)
17. I felt I wasn't worth much as a person.	17 (34%)	14 (28%)	15 (30%)	4 (8%)
18. I felt that I was rather touchy.	19 (38%)	16 (32%)	8 (16%)	7 (14%)
19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	25 (50%)	14 (28%)	5 (10%)	6 (12%)
20. I felt scared without any good reason.	27 (54%)	8 (16%)	10 (20%)	5 (10%)
21. I felt that life was meaningless.	21 (42%)	13 (26%)	8 (16%)	8 (16%)

4.1.4 Perceived social support of the respondents

Table 4.5 shows the distribution of responses to the Multidimensional Scale of Perceived Social Support (MSPSS) items. Overall, respondents reported high levels of perceived social support across all dimensions (family, friends, and significant others). For the item "There is a special person who is around when I am in need," the most frequent responses were Strongly Agree 10 (20%) (Table 4.5) and Mildly Agree 8 (16%) (Table 4.5), suggesting that most respondents had someone to rely on in times of need. Similarly, "I can share my joys and sorrows with my family" recorded its highest frequencies at Strongly Agree 11 (22%) (Table 4.5) and Very Strongly Agree 8 (16%) (Table 4.5), reflecting strong familial emotional support.

Family-related support was further emphasized in "My family really tries to help me" where Very Strongly Agree 16 (32%) (Table 4.5) was most frequent, and "I get the emotional help and support I need from my family" with Very Strongly Agree 12 (24%) (Table 4.5) while regarding friend-related items, "My friends really try to help me" showed the highest response at Strongly Disagree 10 (20%) (Table 4.5), although positive responses were also common in Neutral 9 (18%) (Table 4.5) and Very Strongly Agree 8 (16%) (Table 4.5), suggesting variability in peer support. For "I can count on my friends when things go wrong," the most frequent category was Neutral 12 (24%) (Table 4.5), followed by Mildly Agree 9 (18%) (Table 4.5), implying moderate but reliable friend support.

In "I can talk about my problems with my friends," the modal response was Neutral 13 (26%), and for "My family is willing to help me make decisions," both Mildly Agree and Strongly Agree had equal highest frequencies of 11 (22%), indicating shared family involvement in personal decision-making.

The item “I can talk about my problems with my family” revealed high endorsement of Mildly Agree 15 (30%) (Table 4.5) and Strongly Agree 11 (22%) (Table 4.5), underscoring open communication within families. Similarly, “I get the emotional help and support I need from a special person” was most endorsed at Neutral 11 (22%) (Table 4.5), while “There is a special person with whom I can share my joys and sorrows” peaked at Very Strongly Agree 12 (24%) (Table 4.5), confirming the presence of significant others providing emotional backing.

Table 4.5: Perceived social support of the respondents

MSPSS Item	1 (VSD) n (%)	2 (SD) n (%)	3 (MD) n (%)	4 (N) n (%)	5 (MA) n (%)	6 (SA) n (%)	7 (VSA) n (%)
1. There is a special person who is around when I am in need.	7 (14%)	7 (14%)	6 (12%)	7 (14%)	8 (16%)	10 (20%)	5 (10%)
2. I can share my joys and sorrows with my family.	11 (22%)	5 (10%)	5 (10%)	4 (8%)	6 (12%)	11 (22%)	8 (16%)
3. My family really tries to help me.	4 (8%)	3 (6%)	7 (14%)	8 (16%)	6 (12%)	6 (12%)	16 (32%)
4. I get the emotional help and support I need from my family.	6 (12%)	6 (12%)	7 (14%)	4 (8%)	6 (12%)	9 (18%)	12 (24%)
5. My friends really try to help me.	10 (20%)	2 (4%)	8 (16%)	9 (18%)	7 (14%)	6 (12%)	8 (16%)
6. I can count on my friends when things go wrong.	6 (12%)	5 (10%)	6 (12%)	12 (24%)	9 (18%)	6 (12%)	6 (12%)
7. I can talk about my problems with my friends.	5 (10%)	6 (12%)	5 (10%)	13 (26%)	7 (14%)	9 (18%)	5 (10%)
8. My family is willing to help me make decisions.	2 (4%)	4 (8%)	5 (10%)	8 (16%)	11 (22%)	11 (22%)	9 (18%)
9. I can talk about my problems with my family.	1 (2%)	5 (10%)	4 (8%)	13 (26%)	15 (30%)	11 (22%)	1 (2%)
10. I get the emotional help and support I need from a special person.	7 (14%)	3 (6%)	6 (12%)	11 (22%)	10 (20%)	9 (18%)	4 (8%)
11. There is a special person with whom I can share my joys and sorrows.	4 (8%)	5 (10%)	3 (6%)	9 (18%)	10 (20%)	7 (14%)	12 (24%)
12. I have a special person who is a real source of comfort to me.	6 (12%)	4 (8%)	11 (22%)	5 (10%)	10 (20%)	8 (16%)	6 (12%)

1 = Very Strongly Disagree, 2 = Strongly Disagree, 3 = Mildly Disagree, 4 = Neutral, 5 = Mildly Agree, 6 = Strongly Agree, 7 = Very Strongly Agree.

4.1.5 Association between Exercise Addiction and Perceived Social Support

Table 4.5 shows the chi-square associations between EAI items and perceived social support. A significant association was found for "If I have to miss an exercise session, I feel moody and irritable" ($\chi^2 = 37.42$, $p = 0.04$), indicating that perceived social support was related to emotional responses when exercise was missed. All other EAI items, including "Exercise is the most important thing in my life" ($\chi^2 = 24.015$, $p = 0.461$) and "I use exercise as a way of changing my mood" ($\chi^2 = 26.871$, $p = 0.311$), showed no significant association with perceived social support.

Table 4.6: Chi-square Cross tabulations between Exercise Addiction and Perceived Social Support

EAI Question / Variable	Very strongly disagree n (%)	Strongly disagree n (%)	Mildly disagree n (%)	Neutral n (%)	Mildly Agree n (%)	Strongly agree n (%)	Very strongly agree n (%)	X^2	P
1. Exercise is the most important thing in my life.									
Strong Disagree	1(20%)	1(20%)	1(20%)	1(20%)	1(20%)	0(0%)	0(0%)	24.015	0.461
Disagree	3(10%)	3(10%)	5(20%)	4(16%)	4(16%)	4(16%)	2(8%)		
Neutral	2(7.41%)	311.11%)	6(22.23%)	8(29.64%)	3(11.11%)	3(11.11%)	2(7.41%)		
Agree	0(0%)	4(17.39%)	4(17.39%)	1(4.35%)	4(17.39%)	5(21.75%)	5(21.75%)		
Strongly Agree	0(0%)	0(0%)	1(7.7%)	1(7.7%)	4(30.8%)	3(23.1%)	4(30.8%)		
2. Conflicts have arisen between me and my family or partner about the amount of exercise I do.									
Strong Disagree	0(0%)	1(25%)	1(25%)	0(0%)	0(0%)	1(25%)	1(25%)	25.491	0.379
Disagree	2(15.4%)	3(23.1%)	1(7.7%)	3(23.1%)	2(15.4%)	0(0%)	2(15.4%)		
Neutral	1(4.55%)	1(4.55%)	2(9.1%)	6(27.3%)	6(27.3%)	5(22.75%)	1(4.55%)		
Agree	0(0%)	1(7.7%)	1(7.7%)	2(15.4%)	5(38.5%)	4(30.8%)	0(0%)		
Strongly Agree	0(0%)	0(0%)	0(0%)	0(0%)	2(33.33%)	2(33.33%)	2(33.33%)		
3. I use exercise as a way of changing my mood (e.g., to get a buzz or escape).									
Strong Disagree	0(0%)	0(0%)	1(25%)	0(0%)	0(0%)	1(25%)	2(50%)	26.871	0.311
Disagree	2(15.4%)	1(7.7%)	3(23.1%)	1(7.7%)	2(15.4%)	0(0%)	4(30.8%)		
Neutral	2(9.1%)	2(9.1%)	1(4.55%)	2(9.1%)	2(9.1%)	6(27.3%)	7(31.85%)		
Agree	0(0%)	2(15.4%)	0(0%)	3(23.1%)	2(15.4%)	6(46.2%)	0(0%)		
Strongly Agree	0(0%)	1(16.67%)	0(0%)	2(33.34%)	0(0%)	1(16.67%)	2(33.34%)		

4. Over time I have increased the amount of exercise I do in a day.									
Strong Disagree	0(0%)	0(0%)	1(50%)	0(0%)	0(0%)	0(0%)	1(50%)	29.268	0.399
Disagree	1(9.09%)	1(9.09%)	3(27.27%)	2(18.18%)	1(9.09%)	2(18.18%)	1(9.09%)		
Neutral	0(0%)	0(0%)	1(6.67%)	2(13.34%)	3(20.01%)	4(26.68%)	5(33.35%)		
Agree	0(0%)	0(0%)	1(7.7%)	2(15.4%)	3(23.1%)	2(15.4%)	5(38.5%)		
Strongly Agree	0(0%)	0(0%)	0(0%)	1(16.67%)	1(16.67%)	0(0%)	4(66.68%)		
5**. If I have to miss an exercise session, I feel moody and irritable.**									
Strong Disagree	0(0%)	0(0%)	1(25%)	1(25%)	0(0%)	1(25%)	1(25%)	37.42	0.04*
Disagree	2(15.4%)	2(15.4%)	3(23.1%)	1(7.7%)	0(0%)	4(30.8%)	1(7.7%)		
Neutral	3(13.65%)	1(4.55%)	2(9.1%)	7(31.85%)	4(18.2%)	2(9.1%)	3(13.65%)		
Agree	2(15.4%)	0(0%)	1(7.7%)	1(7.7%)	5(38.5%)	4(30.8%)	0(0%)		
Strongly Agree	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(33.34%)	4(66.68%)		
6**. If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as before.**									
Strong Disagree	0(0%)	1(25%)	1(25%)	0(0%)	0(0%)	2(50%)	0(0%)	25.748	0.366
Disagree	0(0%)	2(16.67%)	1(8.33%)	3(24.99%)	3(24.99%)	3(24.99%)	1(8.33%)		
Neutral	1(4.55%)	2(9.1%)	2(9.1%)	9(40.95%)	3(13.65%)	5(22.75%)	0(0%)		
Agree	0(0%)	1(7.7%)	2(15.4%)	2(15.4%)	4(30.8%)	4(30.8%)	0(0%)		
Strongly Agree	0(0%)	0(0%)	0(0%)	0(0%)	5(83.35%)	1(16.67%)	0(0%)		

4.1.6 Association between Exercise Addiction and DASS-21

Table 4.7 presents the chi-square associations between Exercise Addiction Inventory (EAI) items and the Depression, Anxiety and Stress Scale (DASS-21) responses. The chi-square (χ^2) values ranged from 21.68 to 128.99, with p-values between 0.02 and 0.99. Overall, most EAI items showed no significant association with DASS-21 responses ($p > 0.05$), suggesting that exercise addiction tendencies were generally not related to levels of depression, anxiety, or stress among respondents. However, significant associations were observed for four DASS-21 items: "I couldn't seem to experience any positive feeling at all" ($\chi^2 = 33.95$, $p = 0.031$), "I felt that I was using a lot of nervous energy" ($\chi^2 = 51.58$, $p = 0.02$), "I felt down-hearted and blue" ($\chi^2 = 56.53$, $p = 0.02$), and "I felt that I was rather touchy" ($\chi^2 = 65.98$, $p = 0.02$). These findings indicate that respondents with higher exercise addiction tendencies were more likely to report negative mood states, heightened nervous energy, and emotional sensitivity, suggesting that excessive preoccupation with exercise may be associated with mild depressive or stress-related symptoms in some individuals.

Table 4.7: Association between exercise addiction and depression, stress and anxiety scale

DASS-21 Item	EAI						
	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	X^2	p-value
1. I found it hard to wind down.	4(6%)	17(27%)	19(30%)	15(23%)	9(14%)		
None	0(0%)	5(29%)	2(12%)	6(35%)	4(24%)	24.51	0.433
Some Extent							
Most time							
	1(5%)	1(5%)	6(30%)	11(55%)	1(5%)		
2. My mouth felt dry.	36(44%)	9(11%)	10(12%)	24(30%)	2(2%)		
None	1(5%)	1(5%)	17(81%)	1(5%)	1(5%)	70.94	0.31
Some Extent							
Most time							
	7(32%)	5(23%)	6(27%)	1(5%)	3(14%)		
3. I couldn't seem to experience any positive feeling at all.	5(8%)	16(26%)	19(31%)	16(26%)	5(8%)		
None	1(4%)	6(21%)	18(64%)	2(7%)	1(4%)	33.95	0.031*
Some Extent							
Most time							
	1(3%)	3(9%)	25(76%)	1(3%)	3(9%)		
4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	3(5%)	2(3%)	33(54%)	2(3%)	21(34%)		
None	5(12%)	6(14%)	22(51%)	5(12%)	5(12%)	55.03	0.21
Some Extent							
Most time							
	4(10%)	1(2%)	3(7%)	28(68%)	5(12%)		
5. I found it difficult to work up the initiative to do things.	2(3%)	3(4%)	19(27%)	27(38%)	20(28%)		
None	5(23%)	1(5%)	12(55%)	1(5%)	3(14%)	80.32	0.77
Some Extent							
Most time							
	2(5%)	2(5%)	21(57%)	7(19%)	5(14%)		
6. I tended to over-react to situations.	8(13%)	10(16%)	33(54%)	8(13%)	2(3%)		
None	5(24%)	2(10%)	7(33%)	6(29%)	1(5%)	36.43	0.08
Some Extent							
Most time							
	8(29%)	4(14%)	13(46%)	2(7%)	1(4%)		

7. I experienced trembling (e.g., in the hands).	4(6%)	6(9%)	41(59%)	17(24%)	2(3%)		
None	1(3%)	5(16%)	22(71%)	2(6%)	1(3%)	48.40	0.23
Some Extent							
Most time							
	12(39%)	2(6%)	9(29%)	7(23%)	1(3%)		
8. I felt that I was using a lot of nervous energy.	2(3%)	2(3%)	43(61%)	16(23%)	7(10%)		
None	1(2%)	1(2%)	18(43%)	10(24%)	12(29%)	51.58	0.02*
Some Extent							
Most time							
	4(9%)	6(13%)	15(33%)	2(4%)	18(40%)		
9. I worried about situations in which I might panic and make a fool of myself.	8(13%)	16(27%)	8(13%)	24(40%)	4(7%)		
None	6(21%)	8(28%)	9(31%)	5(17%)	1(3%)	95.45	0.22
Some Extent							
Most time							
	11(24%)	1(2%)	13(29%)	1(2%)	19(42%)		
10. I felt that I had nothing to look forward to.	3(3%)	27(28%)	21(21%)	44(45%)	3(3%)		
None	1(5%)	1(5%)	2(9%)	17(77%)	1(5%)	128.99	0.99
Some Extent							
Most time							
	9(21%)	1(2%)	16(38%)	13(31%)	3(7%)		
11. I found myself getting agitated.	5(11%)	11(23%)	20(43%)	4(9%)	7(15%)		
None	1(2%)	32(71%)	10(22%)	1(2%)	1(2%)	72.23	0.34
Some Extent							
Most time							
	1(2%)	1(2%)	15(36%)	9(21%)	16(38%)		
12. I found it difficult to relax.	4(7%)	4(7%)	31(53%)	18(31%)	2(3%)		
None	1(3%)	6(20%)	7(23%)	13(43%)	3(10%)	44.53	0.45
Some Extent							
Most time							
	16(47%)	1(3%)	14(41%)	2(6%)	1(3%)		
13. I felt down-hearted and blue.	5(8%)	15(25%)	31(53%)	5(8%)	3(5%)		
None	6(20%)	1(3%)	6(20%)	14(47%)	3(10%)	56.53	0.02*
Some Extent							
Most time							
	1(4%)	11(41%)	12(44%)	2(7%)	1(4%)		
14. I was intolerant of anything that kept me from getting on with what I was doing.	2(5%)	4(10%)	8(19%)	25(60%)	3(7%)		

None	2(7%)	1(3%)	23(79%)	2(7%)	1(3%)	63.56	0.67
Some Extent							
Most time							
	10(43%)	2(9%)	6(26%)	4(17%)	1(4%)		
15. I felt I was close to panic.	12(15%)	5(6%)	35(44%)	18(22%)	10(12%)		
None	1(2%)	1(2%)	11(26%)	29(67%)	1(2%)	62.92	0.34
Some Extent							
Most time							
	7(23%)	1(3%)	20(67%)	1(3%)	1(3%)		
16. I was unable to become enthusiastic about anything.	2(3%)	2(3%)	30(45%)	22(33%)	10(15%)		
None	5(16%)	2(6%)	15(47%)	2(6%)	8(25%)	60.51	0.84
Some Extent							
Most time							
	2(7%)	2(7%)	10(34%)	12(41%)	3(10%)		
17. I felt I wasn't worth much as a person.	16(21%)	13(17%)	36(47%)	9(12%)	2(3%)		
None	2(4%)	19(40%)	17(36%)	8(17%)	1(2%)	80.47	0.33
Some Extent							
Most time							
	9(23%)	13(33%)	10(26%)	6(15%)	1(3%)		
18. I felt that I was rather touchy.	3(3%)	21(21%)	42(42%)	25(25%)	8(8%)		
None	5(23%)	2(9%)	8(36%)	5(23%)	2(9%)	65.98	0.02*
Some Extent							
Most time							
	1(3%)	4(11%)	19(53%)	2(6%)	10(28%)		
19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	27(36%)	22(30%)	19(26%)	4(5%)	2(3%)		
None	2(7%)	11(38%)	7(24%)	8(28%)	1(3%)	86.20	0.22
Some Extent							
Most time							
	1(2%)	14(34%)	13(32%)	1(2%)	12(29%)		
20. I felt scared without any good reason.	2(3%)	27(44%)	19(31%)	9(15%)	4(7%)		
None	6(21%)	2(7%)	5(18%)	14(50%)	1(4%)	76.27	0.99
Some Extent							
Most time							
	2(5%)	5(12%)	22(51%)	10(23%)	4(9%)		
21. I felt that life was meaningless.	3(4%)	2(3%)	35(51%)	25(37%)	3(4%)		
None	2(9%)	2(9%)	16(70%)	2(9%)	1(4%)	21.68	0.441
Some Extent	4(6%)	17(27%)	19(30%)	15(23%)	9(14%)		

Most time	0(0%)	5(29%)	2(12%)	6(35%)	4(24%)

4.2 Hypothesis testing

Hypothesis 1

There would be no significant association between perceiving exercise as the most important thing in life and perceived social support.

• Test: Chi-square test $\chi^2 = 24.015$

• Observed χ^2, p-value: $p = 0.461$

• Judgement: The observed p-value is greater than 0.05; hence the null hypothesis was NOT REJECTED.

Hypothesis 2

There would be no significant association between conflict over exercise and perceived social support.

• Test: Chi-square test : $\chi^2 = 25.491$

• Observed χ^2, p-value:, $p = 0.379$

• Judgement: The observed p-value is greater than 0.05; hence the null hypothesis was NOT REJECTED.

Hypothesis 3

There would be no significant association between using exercise as a way of changing mood and perceived social support.

• Test: Chi-square test $\chi^2 = 26.871$

• Observed χ^2, p-value: $p = 0.311$

• Judgement: The observed p-value is greater than 0.05; hence the null hypothesis was NOT REJECTED.

Hypothesis 4

There would be no significant association between increasing exercise over time and perceived social support.

• Test: Chi-square test $\chi^2 = 29.268$

• Observed χ^2, p-value: $p = 0.399$

• Judgement: The observed p-value is greater than 0.05; hence the null hypothesis was NOT REJECTED.

Hypothesis 5

There would be no significant association between feeling moody or irritable when missing exercise and perceived social support.

• Test: Chi-square test $\chi^2 = 37.42$

• Observed χ^2, p-value: $p = 0.04$

• Judgement: The observed p-value is less than 0.05; hence the null hypothesis was REJECTED.

Hypothesis 6

There would be no significant association between returning to previous exercise frequency after reduction and perceived social support.

• Test: Chi-square test $\chi^2 = 25.748$

• Observed χ^2, p-value: $p = 0.366$

• Judgement: The observed p-value is greater than 0.05; hence the null hypothesis was NOT REJECTED.

Hypothesis 7

There would be no significant association between exercise addiction and finding it hard to wind down.

• Test: Chi-square test $\chi^2 = 24.51$

• Observed χ^2, p-value: $p = 0.433$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 8

There would be no significant association between exercise addiction and dry mouth symptoms.

• Test: Chi-square test $\chi^2 = 70.94$

• Observed χ^2, p-value: $p = 0.31$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 9

There would be no significant association between exercise addiction and inability to experience positive feelings.

• Test: Chi-square test $\chi^2 = 33.95$

• Observed χ^2, p-value: $p = 0.031$

• Judgement: $p < 0.05$; the null hypothesis was REJECTED.

Hypothesis 10

There would be no significant association between exercise addiction and breathing difficulty.

• Test: Chi-square test $\chi^2 = 55.03$

• Observed χ^2, p-value: $p = 0.21$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 11

There would be no significant association between exercise addiction and initiative to do things.

• Test: Chi-square test $\chi^2 = 80.32$,

• Observed χ^2, p-value: $p = 0.77$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 12

There would be no significant association between exercise addiction and over-reacting to situations.

• Test: Chi-square test $\chi^2 = 36.43$

• Observed χ^2, p-value: $p = 0.08$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 13

There would be no significant association between exercise addiction and trembling.

• Test: Chi-square test $\chi^2 = 48.40$

• Observed χ^2, p-value: $p = 0.23$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 14

There would be no significant association between exercise addiction and using a lot of nervous energy.

• Test: Chi-square test $\chi^2 = 51.58$,

• Observed χ^2, p-value: $p = 0.02$

• Judgement: $p < 0.05$; the null hypothesis was REJECTED.

Hypothesis 15

There would be no significant association between exercise addiction and worrying about panic situations.

• Test: Chi-square test $\chi^2 = 95.45$

• Observed χ^2, p-value: $p = 0.22$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 16

There would be no significant association between exercise addiction and having nothing to look forward to.

• Test: Chi-square test $\chi^2 = 128.99$

• Observed χ^2, p-value: $p = 0.99$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 17

There would be no significant association between exercise addiction and getting agitated.

• Test: Chi-square test $\chi^2 = 72.23$

• Observed χ^2, p-value: $p = 0.34$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 18

There would be no significant association between exercise addiction and difficulty relaxing.

• Test: Chi-square test $\chi^2 = 44.53$

• Observed χ^2, p-value: $p = 0.45$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 19

There would be no significant association between exercise addiction and feeling down-hearted or blue.

• Test: Chi-square test $\chi^2 = 56.53$

• Observed χ^2, p-value: $p = 0.02$

• Judgement: $p < 0.05$; the null hypothesis was REJECTED.

Hypothesis 20

There would be no significant association between exercise addiction and intolerance to interruptions.

• Test: Chi-square test $\chi^2 = 63.56$

• Observed χ^2, p-value: $p = 0.67$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 21

There would be no significant association between exercise addiction and feeling close to panic.

• Test: Chi-square test $\chi^2 = 62.92$

• Observed χ^2, p-value: $p = 0.34$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 22

There would be no significant association between exercise addiction and inability to become enthusiastic.

• Test: Chi-square test $\chi^2 = 60.51$

• Observed χ^2, p-value: $p = 0.84$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 23

There would be no significant association between exercise addiction and feeling worthless as a

person.

• Test: Chi-square test $\chi^2 = 80.47$

• Observed χ^2, p-value: $p = 0.33$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 24

There would be no significant association between exercise addiction and feeling touchy.

• Test: Chi-square test $\chi^2 = 65.98$

• Observed χ^2, p-value: $p = 0.02$

• Judgement: $p < 0.05$; the null hypothesis was REJECTED.

Hypothesis 25

There would be no significant association between exercise addiction and awareness of heartbeat.

• Test: Chi-square test $\chi^2 = 86.20$

• Observed χ^2, p-value: $p = 0.22$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 26

There would be no significant association between exercise addiction and feeling scared without reason.

• Test: Chi-square test $\chi^2 = 76.27$

• Observed χ^2, p-value: $p = 0.99$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

Hypothesis 27

There would be no significant association between exercise addiction and perceiving life as

meaningless.

• Test: Chi-square test $\chi^2 = 21.68$

• Observed χ^2, p-value: $p = 0.441$

• Judgement: $p > 0.05$; the null hypothesis was NOT REJECTED.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This study examined the relationship between exercise addiction, depression, anxiety, stress, and perceived social support among student athletes. The findings are discussed under key themes, integrating existing evidence to explain similarities and discrepancies with prior studies. The study sample comprised mostly males, with the majority aged between 18–25 years. This gender distribution aligns with studies by Berczik et al. (2012) and Griffiths et al. (2015), who found that exercise addiction tends to be more prevalent among younger male participants, possibly due to higher competitiveness and stronger drive for athletic performance. The predominance of university students within this age range also corresponds with findings from Szabo et al. (2022), who noted that younger individuals are more likely to engage in high-intensity physical activities and may exhibit early signs of exercise dependence. Most participants were single and engaged primarily in football, sprinting, or basketball, which are vigorous sports requiring frequent training. Similar demographic trends have been reported by Adams et al. (2020), who observed that team sports often foster social comparison and performance pressure that can promote compulsive exercise behaviours.

The findings revealed that most respondents showed moderate involvement in exercise, with few demonstrating characteristics consistent with potential addiction. Only a small proportion “strongly agreed” that exercise was the most important thing in their life, while a smaller proportion reported frequent mood disturbances when unable to exercise. This pattern aligns with Lichtenstein et al. (2021), who identified moderate exercise commitment among most

athletes, with only a minority meeting clinical criteria for addiction. However, the significant association found between feeling moody or irritable when missing exercise and perceived social support suggests that social context influences the emotional impact of exercise deprivation. This finding is consistent with White et al. (2023) and de-la Vega et al. (2016), who argued that inadequate social support and social isolation can exacerbate compulsive tendencies, as exercise becomes a primary coping outlet for emotional regulation. Conversely, individuals with stronger social networks are less likely to experience negative effects when exercise routines are disrupted, reinforcing the buffering role of social relationships against behavioural dependence.

Across the DASS-21 items, most respondents reported low levels of depression, anxiety, and stress. This indicates generally positive psychological well-being among student athletes. The low levels of stress align with Wagan et al. (2021), who reported that regular exercise often improves mood and reduces anxiety through neurochemical mechanisms such as endorphin release and enhanced self-esteem. Nevertheless, significant associations were observed between exercise addiction and several affective indicators: “I couldn’t seem to experience any positive feeling at all”, “I felt that I was using a lot of nervous energy”, “I felt downhearted and blue”, and “I felt that I was rather touchy”. These results suggest that higher exercise addiction tendencies may be associated with emotional instability, heightened arousal, and mild depressive symptoms. This finding corroborates the work of Tschopp et al. (2023) and Levit et al. (2011), who documented a strong link between exercise dependence and negative affect, particularly when exercise serves as a maladaptive coping mechanism. Levit et al. (2011) further explained that addicted exercisers often rely on training to regulate negative mood states; hence, absence from exercise can trigger irritability, tension, or feelings of worthlessness. The present results support this theoretical model, showing that emotional reactivity (e.g., downhearted, or restless)

may signal underlying psychological dependence on exercise. However, the majority of respondents did not exhibit pathological levels of distress, aligning with Weinstein and Szabo (2023), who noted that only a small fraction of regular exercisers develops clinical addiction. This suggests that exercise addiction among university athletes may occur along a spectrum ranging from healthy commitment to compulsive preoccupation and depending on personal and social moderators such as motivation and support systems.

The findings of this study further revealed that respondents reported high levels of perceived social support from family, friends, and significant others, with the majority agreeing that they could rely on others in times of need. This strong perception of social connectedness supports findings by Mira et al. (2023) and Delfin et al. (2024), who emphasized that social support enhances emotional resilience and moderates stress responses among athletes. Interestingly, while most Exercise Addiction Inventory items showed no significant association with social support, the single significant relationship which exists between mood disturbance when missing exercise and perceived support suggests that individuals with weaker social bonds may be more emotionally reliant on exercise for mood regulation. This aligns with Zimanyi et al. (2021), who proposed that low social support can increase vulnerability to addictive exercise as individuals use training to fill emotional voids or escape interpersonal stressors.

5.2 Conclusion

This study explored the relationship between exercise addiction, depression, anxiety, stress, and perceived social support among student athletes. The findings revealed that most respondents demonstrated healthy exercise patterns and low levels of psychological distress, indicating positive well-being. However, a small proportion exhibited symptoms consistent with potential

exercise addiction, such as irritability and mood changes when unable to exercise. Significant associations were found between exercise addiction and certain emotional indicators, including difficulty experiencing positive feelings, nervous energy, and feeling downhearted or touchy. These results suggest that excessive or compulsive engagement in exercise can negatively affect emotional regulation and mental health. Moreover, highly perceived social support from family, friends, and significant others played a protective role, moderating the psychological impact of intense exercise engagement.

5.3 Recommendations

i. Promote healthy exercise behaviour: Educational campaigns should be developed within universities to raise awareness about the signs and risks of exercise addiction and to promote balanced training habits.

ii. Implement routine psychological assessments: Institutions should conduct periodic screening for anxiety, depression, and compulsive exercise tendencies among student athletes to enable early intervention.

iii. Enhance social support systems: Sports clubs and faculties should encourage peer mentoring and support networks to buffer emotional stress and reduce reliance on exercise as a primary coping mechanism.

iv. Integrate mental health education into Sports Curricula: Incorporate sports psychology and stress management courses into athletic training programs to foster self-regulation, resilience, and emotional intelligence.

5.4 Implication for further studies

The findings of this study provide a foundation for future research on the psychological and social dimensions of exercise behaviour among young adults and athletes. Given that the current study used a cross-sectional design with a relatively small sample of student athletes, future studies should employ larger, more diverse, and multi-centre samples to improve generalisability. Longitudinal studies are also recommended to examine how exercise addiction and psychological wellbeing evolve over time, particularly in response to training intensity and academic stress.

Moreover, interventional research could explore the effectiveness of counselling, mindfulness, and psychoeducational programs in preventing or reducing exercise dependence. Future studies should also investigate gender differences, personality traits (such as perfectionism or competitiveness), and motivation types (intrinsic vs. extrinsic) as potential mediators between exercise behaviour and mental health. Including qualitative methods, such as interviews or focus groups, would help uncover deeper emotional and social experiences surrounding exercise habits. Comparative studies across cultural contexts could further clarify how sociocultural values influence the interplay between exercise addiction, psychological health, and social support.

REFERENCES

Afonso, J., Clemente, F. M., Nakamura, F. Y., Morouço, P., Sarmento, H., Inman, R. A., & Ramirez-Campillo, R. (2021). The Effectiveness of Post-exercise Stretching in Short-Term and Delayed Recovery of Strength, Range of Motion and Delayed Onset Muscle Soreness: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Frontiers in physiology*, *12*, 677581. https://doi.org/10.3389/fphys.2021.677581

Ahorsu, D. K., Imani, V., Potenza, M. N., Chen, H. P., Lin, C. Y., & Pakpour, A. H. (2023). Mediating roles of psychological distress, insomnia, and body image concerns in the association between exercise addiction and eating disorders. Psychology research and behavior management, 2533-2542.

Akbar, S., Soh, K. G., Jazaily Mohd Nasiruddin, N., Bashir, M., Cao, S., & Soh, K. L. (2022). Effects of neuromuscular training on athletes physical fitness in sports: A systematic review. *Frontiers in physiology*, *13*, 939042.

Alcaraz-Ibáñez, M., Paterna, A., Griffiths, M. D., & Sicilia, Á. (2022). An exploratory examination of the relationship between symptoms of depression and exercise addiction among undergraduate recreational exercisers. *International Journal of Mental Health and Addiction*, *20*(3), 1385-1397.

Antunes, H. K., Leite, G. S., Lee, K. S., Barreto, A. T., Santos, R. V., Souza, H.deS., Tufik, S., & de Mello, M. T. (2016). Exercise deprivation increases negative mood in exercise-addicted subjects and modifies their biochemical markers. *Physiology & behavior*, *156*, 182–190. https://doi.org/10.1016/j.physbeh.2016.01.028

Anugraheni, T. D., Izzah, L., & Hadi, M. S. (2023). Increasing the students' speaking ability through role-playing with Slovin's Formula Sample Size. *Jurnal Studi Guru Dan Pembelajaran*, *6*(3), 262-272.

Astuti, Y., Orhan, B. E., Karaçam, A., & Govindasamy, K. (2024). The Relationship between Physical Activity Enjoyment and Exercise Addiction. *International Journal of Human Movement and Sports Sciences*, *12*(4), 720–728. https://doi.org/10.13189/saj.2024.120414,

Atadokht, A., Jokar Kamalabadi, N., Hosseini Kiasari, T., & Bashar-Pour, S. (2014). The role of perceived social support in predicting psychological disorders in people with physical disability and its comparison with normal subjects. *Archives of Rehabilitation*, *15*(3), 26-36.

Awotidebe, T. O., Adedoyin, R. A., Adegbesan, O. A., Babalola, J. F., Olukoju, I. O., Mbada, C. E., Chirwa, E. D., & Bisiriyu, A. L. (2014). Psychosocial correlates of physical activity participation among Nigerian university students. *International Journal of Sports Science, 4*(6), 205–211.

Bellicha, A., van Baak, M. A., Battista, F., Beaulieu, K., Blundell, J. E., Busetto, L., ... & Oppert, J. M. (2021). Effect of exercise training on weight loss, body composition changes, and weight maintenance in adults with overweight or obesity: An overview of 12 systematic reviews and 149 studies. *Obesity Reviews*, *22*, e13256.

Berczik, K., Szabó, A., Griffiths, M. D., Kurimay, T., Kun, B., Urbán, R., & Demetrovics, Z. (2012). Exercise Addiction: Symptoms, Diagnosis, Epidemiology, and Etiology.

Substance Use & Misuse, *47*(4), 403–417. https://doi.org/10.3109/10826084.2011.639120

Bóna, E., Szél, Z., Kiss, D., & Gyarmathy, V. A. (2019). An unhealthy health behavior: Analysis of orthorexic tendencies among Hungarian gym attendees. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *24*(1), 13–20. https://doi.org/10.1007/s40519-018-0592-0.

Bushman, B. A. (2020). Exercise for prevention of chronic diseases. ACSM's Health & Fitness Journal, 24(1), 5-10

Bushman, B. A. (2020). Exercise for prevention of chronic diseases. *ACSM's Health & Fitness Journal*, *24*(1), 5-10.

Caru, M., Poulnais, S., Gorwood, P., & Kern, L. (2022). Exercise addiction, pain and injuries in amateur athletes. *Sport Sciences for Health*, *18*(4), 1253-1261.

Chang, X., Xu, S., & Zhang, H. (2022). Regulation of bone health through physical exercise: Mechanisms and types. *Frontiers in endocrinology*, *13*, 1029475.

Codima, A., das Neves Silva, W., de Souza Borges, A. P., & de Castro Jr, G. (2021). Exercise prescription for symptoms and quality of life improvements in lung cancer patients: a systematic review. *Supportive Care in Cancer*, *29*(1), 445-457.

Coker, A. O., Coker, O. O., & Sanni, D. (2018). Psychometric properties of the 21-item Depression Anxiety Stress Scale (DASS-21). *African Research Review*, *12*(2), pp.135.

Cresswell, S. L., & Eklund, R. C. (2006). The nature of player burnout in rugby: Key characteristics and attributions. *Journal of Applied Sport Psychology, 18*(3), 219-239. https://doi.org/10.1080/10413200600830299

De la Vega, R., Parastatidou, I. S., Ruíz-Barquín, R., & Szabo, A. (2016). Exercise Addiction in Athletes and Leisure Exercisers: The Moderating Role of Passion. *Journal of behavioral addictions*, *5*(2), 325–331. https://doi.org/10.1556/2006.5.2016.043

Delfin, D., Wallace, J., Baez, S., Karr, J. E., Terry, D. P., Hibbler, T., ... & Newman, S. (2024). Social support, stress, and mental health: examining the stress-buffering hypothesis in adolescent football athletes. *Journal of Athletic Training*, *59*(5), 499-505.

Dinardi, J. S., Egorov, A. Y., & Szabo, A. (2021). The expanded interactional model of exercise addiction. *Journal of Behavioral Addictions*, *10*(3), 626-631.

Fan, Q., Duan, H., & Xing, X. (2024). A review of composite materials for enhancing support, flexibility and strength in exercise. *Alexandria Engineering Journal*, *94*, 90-103.

Freimuth, M., Moniz, S., & Kim, S. R. (2011). Clarifying exercise addiction: Differential diagnosis, co-occurring disorders, and phases of addiction. *International Journal of Environmental Research and Public Health, 8*(10), 4069-4081.

Gibson, A. L., Wagner, D. R., & Heyward, V. H. (2024). *Advanced fitness assessment and exercise prescription*. Human kinetics.

Gori, A., Topino, E., & Griffiths, M. D. (2021). A screening tool for exercise addiction: The psychometric properties of the Italian Exercise Addiction Inventory. *International Journal of Mental Health and Addiction*, 1-18.

Herbert, C., Meixner, F., Wiebking, C., & Gilg, V. (2020). Regular physical activity, short-term exercise, mental health, and well-being among university students: the results of an online and a laboratory study. *Frontiers in psychology*, *11*, 509.

Juwono, I. D., Tolnai, N., & Szabo, A. (2022). Exercise Addiction in Athletes: A Systematic Review of the Literature. International Journal of Mental Health and Addiction, 20(5), 3113–3127. https://doi.org/10.1007/s11469-021-00568-1

Katagami, E., & Tsuchiya, H. (2017). Effects of received social support on athletes' psychological well-being. *International Journal of Sport and Health Science*, *15*, 72–80.

Kenney, W. L., Wilmore, J. H., & Costill, D. L. (2022). *Physiology of sport and exercise*. Human kinetics.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, *43*(2), 207–222.

Lampe, E. W., Presseller, E. K., Abber, S. R., Sonnenblick, R. M., Juarascio, A. S., & Manasse, S. M. (2023). Affective profiles of exercise episodes are associated with maladaptive and adaptive motivations for exercise. European Eating Disorders Review, 31(6), 863–873. https://doi.org/10.1002/erv.3012

Lantz, C. D., Rhea, D. J., & Cornelius, A. E. (2002). Muscle dysmorphia in elite-level power lifters and bodybuilders: A test of differences within a conceptual model. The Journal of Strength & Conditioning Research, 16(4), 649–655.

Lee, L. Y., Healy, M. P., Fischer, N. L., Tong, K., Chen, A. S., Sahakian, B. J., & Kourtzi, Z. (2024). Cognitive flexibility training for impact in real-world settings. *Current Opinion in Behavioral Sciences*, *59*, 101413.

Levit, M., Weinstein, A., Weinstein, Y., Tzur-Bitan, D., & Weinstein, A. (2018). A study on the relationship between exercise addiction, abnormal eating attitudes, anxiety and depression among athletes in Israel. *Journal of behavioral addictions*, *7*(3), 800-805.

Lichtenstein, M. B., Melin, A. K., Szabo, A., & Holm, L. (2021). The prevalence of exercise addiction symptoms in a sample of national level elite athletes. *Frontiers in Sports and Active Living*, *3*, 635418.

Lichtenstein, M. B., Larsen, K. S., Christiansen, E., Støving, R. K., & Bredahl, T. V. G. (2014). Exercise addiction in team sport and individual sport: Prevalences and validation of the exercise addiction inventory. Addiction Research & Theory, 22(5), 431–437. https://doi.org/10.3109/16066359.2013.875537

Lukács, A., Sasvári, P., Varga, B., & Mayer, K. (2019). Exercise addiction and its related factors in amateur runners. Journal of behavioral addictions, 8(2), 343-349.

Luo, S., Soh, K. G., Soh, K. L., Sun, H., Nasiruddin, N. J. M., Du, C., & Zhai, X. (2022). Effect of Core Training on Skill Performance Among Athletes: A Systematic Review. *Frontiers in physiology*, *13*, 915259. https://doi.org/10.3389/fphys.2022.915259

Mayolas-Pi, C., Simon-Grima, J., Penarrubia-Lozano, C., Munguia-Izquierdo, D., Moliner-Urdiales, D., & Legaz-Arrese, A. (2016). Exercise addiction risk and health in male and female amateur endurance cyclists. Journal of Behavioral Addictions, 6(1), 74-83.

Mayolas-Pi, C., Sitko, S., Pano-Rodriguez, A., Lopez-Laval, I., Reverter-Masia, J., & Legaz-Arrese, A. (2025). Exercise addiction and psychosocial health risks among adolescent athletes: Focus on sport type and performance level. Journal of Behavioral Addictions. https://doi.org/10.1556/2006.2025.00024

McNally, R., Wnterowd, C., & Farra, A. (2021). Psychological sense of community, perceived social support, and grief experiences among bereaved college students. *College Student Journal*, *55*(1), pp.67-79.

Meyer, M., Sattler, I., Schilling, H., Lang, U. E., Schmidt, A., Colledge, F., & Walter, M. (2021). Mental disorders in individuals with exercise addiction—a cross-sectional study. Frontiers in psychiatry, 12, 751550.

Mira, T., Jacinto, M., Costa, A. M., Monteiro, D., Diz, S., Matos, R., & Antunes, R. (2023). Exploring the relationship between social support, resilience, and subjective well-being in athletes of adapted sport. *Frontiers in psychology*, *14*, 1266654.

Moya, E., Larson, L. M., Stewart, R. C., Fisher, J., Mwangi, M. N., & Phiri, K. S. (2022). Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi. *BMC Psychiatry*, *22*(1), PP.352.

Noseworthy, M., Peddie, L., Buckler, E. J., Park, F., Pham, M., Pratt, S., … & Liu-Ambrose, T. (2023). The effects of outdoor versus indoor exercise on psychological health, physical health, and physical activity behaviour: a systematic review of longitudinal trials. International journal of environmental research and public health, 20(3), 1669.

Osman, A., Lamis, D. A., Freedenthal, S., Gutierrez, P. M., & McNaughton-Cassill, M. (2014). The multidimensional scale of perceived social support: analyses of internal reliability, measurement invariance, and correlates across gender. *Journal of personality assessment*, *96*(1), 103–11

Pálfi, V., Kovacsik, R., & Szabo, A. (2021). Symptoms of exercise addiction in aerobic and anaerobic exercises: Beyond the components model of addiction. *Addictive Behaviors Reports*, *14*, 100369.

Papalia, G. F., Papalia, R., Diaz Balzani, L. A., Torre, G., Zampogna, B., Vasta, S., ... & Denaro, V. (2020). The effects of physical exercise on balance and prevention of falls in older people: A systematic review and meta-analysis. *Journal of clinical medicine*, *9*(8), 2595.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141-166.

Sabag, A., Chang, C. R., Francois, M. E., Keating, S. E., Coombes, J. S., Johnson, N. A., … & Lopez, J. P. R. (2023). The effect of exercise on quality of life in type 2 diabetes: a systematic review and meta-analysis. Medicine & Science in Sports & Exercise, 55(8), 1353-1365.

Smith, P. J., & Merwin, R. M. (2021). The role of exercise in management of mental health disorders: an integrative review. *Annual review of medicine*, *72*(1), 45-62.

Sussman, S., Lisha, N., & Griffiths, M. (2011). Prevalence of the addictions: A problem of the majority or the minority? *Evaluation & the Health Professions, 34*(1), 3-56.

Szabó, A. (2021). Model fit and reliability of the Hungarian version of the Revised Exercise Addiction Inventory (EAI-R-HU). *Mentálhigiéné És Pszichoszomatika*, *22*(4), 376-394.

Szabo, A., & Ábel, K. (2022). Exercise addiction. In *Behavioral addictions: Conceptual, clinical, assessment, and treatment approaches* (pp. 189-212). Cham: Springer International Publishing.

Terry, A., Szabo, A., & Griffiths, M. (2004). The exercise addiction inventory: A new brief screening tool. *Addiction Research & Theory*, *12*(5), 489-499.

Thompson, W. R., Sallis, R., Joy, E., Jaworski, C. A., Stuhr, R. M., & Trilk, J. L. (2020). Exercise is medicine. *American journal of lifestyle medicine*, *14*(5), 511-523.

Trott, M., Jackson, S. E., Firth, J., Jacob, L., Grabovac, I., Mistry, A., Stubbs, B., & Smith, L. (2021). A comparative meta-analysis of the prevalence of exercise addiction in adults with and without indicated eating disorders. *Eating and weight disorders : EWD*, *26*(1), 37–46. https://doi.org/10.1007/s40519-019-00842-1

Tschopp, A., Meyer, M., Sattler, I., Walter, M., & Colledge, F. (2023). Exercise addiction and major depressive disorder–clinical diagnoses and longitudinal course. *Addiction & Health*, *15*(2), 144.

Valenzuela, P. L., Castillo-García, A., Morales, J. S., de la Villa, P., Hampel, H., Emanuele, E., ... & Lucia, A. (2020). Exercise benefits on Alzheimer's disease: State-of-the-science. *Ageing research reviews*, *62*, 101108.

Wågan, F. A., Darvik, M. D., & Pedersen, A. V. (2021). Associations between self-esteem, psychological stress, and the risk of exercise dependence. *International Journal of Environmental Research and Public Health*, *18*(11), 5577

Weinstein, A., & Szabo, A. (2023). Exercise addiction: A narrative overview of research issues. *Dialogues in clinical neuroscience*, *25*(1), 1–13. https://doi.org/10.1080/19585969.2023.2164841.

Weinstein, A., & Weinstein, Y. (2014). Exercise addiction- diagnosis, bio-psychological mechanisms and treatment issues. *Current Pharmaceutical Design, 20*(25), 4062-4069.

White, R. L., Ryan, D., Young, C., Elston, R., & Rossi, T. (2023). How does the context of physical activity influence perceived mood and wellbeing after exercise?. *Mental health and physical activity*, *24*, 100504.

World Health Organization (WHO). (2018). Global Action Plan on Physical Activity 2018-2030: More Active People for A Healthier World. https://doi.org/10.1016/j.jpolmod.2006.06.007

Zhang, F., Shao, Y., Xie, H., Jia, Z., & Zhang, H. (2024). The effect of depression, anxiety and stress in the risk of exercise addiction among college students. *Chinese Journal of Behavioral Medicine and Brain Science*, 265-270.

Zimanyi, Z., Wolff, W., & Schüler, J. (2021). Too much of a good thing? Exercise dependence in endurance athletes: relationships with personal and social resources. *International journal of environmental research and public health*, *18*(6), 2966.

APPENDICES

APPENDIX A

SOCIODEMOGRAPHIC DATA

Please fill in the details

Gender: ☐ Female ☐ Male

Age: ☐ 18-25 years ☐ 25- 32 years ☐ 32-40 years ☐ 40 years and above

Level: ☐ 100L ☐ 200L ☐ 300 ☐ 400L ☐ 500 L ☐ 600 L

Faculty: _____

Marital status: ☐ Single ☐ Married ☐ Divorced

Type of sports: ☐ Football ☐ Basketball ☐ Sprint ☐ Volleyball ☐ Swimming ☐

Prior injury: ☐ Yes ☐ No

Frequency of sporting activities: ☐ Daily ☐ 1 -2/week ☐ 3-4/week

Duration of training: ☐ 1 hour ☐ 2 hours ☐ 3 hours ☐ > 3 hours

APPENDIX B

EXERCISE ADDICTION INVENTORY (EAI)

Purpose:

To identify individuals at risk of exercise addiction.

Structure:

- 6 items
- Each item rated on a 5-point Likert scale:
- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neither agree nor disagree
- 4 = Agree
- 5 = Strongly agree

Items:

1. Exercise is the most important thing in my life.
2. Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do.
3. I use exercise as a way of changing my mood (e.g., to get a buzz, to escape, etc.).
4. Over time I have increased the amount of exercise I do in a day.

5. If I have to miss an exercise session I feel moody and irritable.
6. If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as I did before.

Scoring:

- Total score range: 6 to 30
- Cut-off:
- < 20 = Asymptomatic
- 20–23 = Symptomatic (At risk)
- ≥ 24 = At risk of exercise addiction

APPENDIX C

Depression Anxiety Stress Scales – 21 (DASS-21)

Purpose:

Measures three related negative emotional states: depression, anxiety, and stress.

Structure:

- 21 items total:
- 7 items each for Depression, Anxiety, and Stress
- Rated on a 4-point Likert scale:
- 0 = Did not apply to me at all
- 1 = Applied to me to some degree
- 2 = Applied to me a considerable degree
- 3 = Applied to me very much

Items by Subscale:

Depression:

1. I couldn't seem to experience any positive feeling at all.
2. I just couldn't seem to get going.
3. I felt that I had nothing to look forward to.
4. I felt down-hearted and blue.

5. I was unable to become enthusiastic about anything.
6. I felt I wasn't worth much as a person.
7. I felt that life was meaningless.

Anxiety:

1. I was aware of dryness of my mouth.
2. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).
3. I experienced trembling (e.g., in the hands).
4. I was worried about situations in which I might panic and make a fool of myself.
5. I felt I was close to panic.
6. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).
7. I felt scared without any good reason.

Stress:

1. I found it hard to wind down.
2. I tended to over-react to situations.
3. I felt that I was using a lot of nervous energy.
4. I found myself getting agitated.
5. I found it difficult to relax.

6. I was intolerant of anything that kept me from getting on with what I was doing.

7. I felt that I was rather touchy.

Scoring:

- Add scores for each subscale (Depression, Anxiety, Stress), then multiply by 2 to get final scores (since DASS-21 is a short form of DASS-42).

APPENDIX D

Multidimensional Scale of Perceived Social Support (MSPSS)

Purpose:

Assesses perceived social support from three sources: Family, Friends, and Significant Other.

Structure:

- 12 items in total
- 3 subscales with 4 items each
- Rated on a 7-point Likert scale:
- 1 = Very strongly disagree
- 2 = Strongly disagree
- 3 = Mildly disagree
- 4 = Neutral
- 5 = Mildly agree
- 6 = Strongly agree
- 7 = Very strongly agree

Items:

Significant Other (Items 1, 2, 5, 10):

1. There is a special person who is around when I am in need.

2. There is a special person with whom I can share my joys and sorrows.

5. I have a special person who is a real source of comfort to me.

10. There is a special person in my life who cares about my feelings.

Family (Items 3, 4, 8, 11):

3. My family really tries to help me.

4. I get the emotional help and support I need from my family.

8. I can talk about my problems with my family.

11. My family is willing to help me make decisions.

Friends (Items 6, 7, 9, 12):

6. My friends really try to help me.

7. I can count on my friends when things go wrong.

9. I have friends with whom I can share my joys and sorrows.

12. I can talk about my problems with my friends.

Scoring:

- Average the items for each subscale.
- Also calculate an overall mean score by averaging all 12 items.

APPENDIX E

RESEARCH ETHICS COMMITTEE
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

Chairman: Prof. F. A Imarhiagbe
MBChb, FMCP
Cert Clin Res and ethics (NIH), MD.
0803449092

Email: researchethics.cms@gmail.com

P.M.B 1154, BENIN CITY

Our Ref: CMS/REC/01/VOL.2/822

Date: 14th August, 2025

Re: PREVALENCE OF EXERCISE ADDICTION AND ITS ASSOCIATION WITH PSYCHOLOGICAL WELL-BEING AND SOCIAL SUPPORT AMONGST AMATEUR ATHLETES

Name of Principal Investigator: **NWANKWO GODSFAVOUR CHINAZAEKPERE**
Department Of Physiotherapy,
School of Basic Medical Science
College of Medical Sciences,
University of Benin

REC Approval No: CMS/REC/2024/822

This is to inform you that the research described in the submitted proposal, the Informed Consent Forms and other participant information materials have been reviewed and approved by the College Research Ethics Committee, University of Benin.

This approval dates from **14th August, 2025 to 13th August, 2026.** In multi-year research, Endeavour to submit your annual report to the REC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code of Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the code including ensuring that all adverse events are reported promptly to the REC. No, changes are permitted in the research without prior approval by REC except in circumstances outlined in the code. REC reserves the right to conduct compliance visit to your research site without prior notice. Thank you.

PROF. F.A IMARHIAGBE
Chairman, REC

APPENDIX F

INFORMED CONSENT FORM

Title of the Study: Prevalence of exercise addiction and its affections amongst amateur athletes.

Investigator: Oghumu Saturday Nicholas

Contact Phone Number: 08034215928, 08150947293

Purpose of the Study: To determine the pprevalence of exercise addiction and its affections amongst amateur athletes in the University of Benin and examine its associated effects on their physical health, psychological well-being and social functioning.

Participants: The participants of this study will include both male and female undergraduate students of the University of Benin, Benin City, who participate in sporting events for personal enjoyment, health, recreation or competition within the University.

Procedure: Participants of this study will be recruited from the sports complex of the University, individuals will be approached in person and those who show interest will be assessed against the predefined inclusion criteria. Upon inclusion, participants will be briefed on the purpose, procedure and expectations of the study. Data will be collected from the participants and analyzed to reach a conclusion.

Benefits of Participation: Participants of this study will be informed about the results of the study. Keeping them in the know about exercise addiction, and its untoward effects on them.

Risks of Participation: The procedures of this study are normal data collection procedures with no apparent risks.

Cost/Compensation: There is no cost associated with participation in this study. Participants will be approached while performing normal sporting activities.

Contact Information: If you have any concerns or inquiries about the study, you can contact the named investigator on the stated phone number.

Voluntary Participation: Your participation in this study is voluntary. You have the right to decline participation at any point of this study.

Confidentiality: All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to the study.

Participant's Consent: Now that the study has been fully explained to me and I fully understand the content of the study process, I will be willing to take part in the study.

Participant's signature and Date

Witness' signature and Date

Researcher's signature and Date