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THE RELATIONSHIP BETWEEN EXERCISE ADDICTION, BODY IMAGE PERCEPTION, EATING BEHAVIOUR AND PSYCHOLOGICAL DISTRESS AMONGST FITNESS CENTRE USERS IN KLANG VALLEY

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ABSTRACT

This study investigated the relationships between exercise addiction, body image perception, eating behaviour, and psychological distress (anxiety and depression) among 242 participants. Pearson correlation analyses indicated that exercise frequency was positively associated with exercise addiction ($r = .147$, $p = .022$) and anxiety ($r = .270$, $p < .001$), while correlations with body image, eating behaviour, depression, and BMI were non-significant. Multiple linear regression revealed that exercise frequency had a weak but collectively significant effect on the combination of psychosocial outcomes ($R^2 = .07$, $F = 18.84$, $p < .001$), whereas BMI did not significantly predict these outcomes ($R^2 = .00$, $F = 1.10$, $p = .296$). Additionally, exercise addiction was modestly predicted by body image perception, eating behaviour, and psychological distress ($R^2 = .005$, $F = 13.44$, $p < .001$). These results suggest that higher exercise frequency may signal risk factors for compulsive exercise and anxiety, but exercise frequency and BMI alone do not fully account for variations in body image, eating behaviour, or psychological wellbeing. The findings highlight the importance of screening for exercise addiction and psychological distress in fitness and recreational settings and promoting interventions that support balanced exercise habits and mental health. These findings reveal the psychological challenges faced by fitness centre attendees and stress the need for promoting balanced exercise and positive body image. The research insights can inform targeted interventions to improve mental well-being in fitness settings.

Keywords: *Exercise Addiction, Body Image, Eating Behaviour, Psychological Distress, BMI Fitness Centre*

INTRODUCTION

A noteworthy and significant correlation exists between exercise addiction and negative body image, with body dissatisfaction emerging as a crucial factor contributing to the compulsion for excessive exercise. Individuals who grapple with poor body image often turn to rigorous and sometimes extreme exercise regimens in pursuit of an unattainable "ideal" body shape (Freire et al., 2020). This behaviour can initiate a detrimental cycle in which negative self-perception fuels compulsive exercise, further exacerbating feelings of inadequacy. Over time, this troubling interplay may also heighten the risk of developing

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disordered eating patterns, as the quest for physical perfection overshadows healthy body awareness and self-acceptance (Abi Karim et al., 2025).

A negative body image and persistent dissatisfaction with one's appearance are significant factors that can lead to exercise addiction. Individuals may engage in obsessive exercise routines, driven by a desire to reshape their bodies and attain an idealized self-image. This compulsive behaviour often stems from an internal struggle to fill the emotional void created by harsh self-perceptions (Tariq & Saad, 2025).

A cycle of negative reinforcement emerges when an individual's perceived flaws drive them to engage in excessive exercise. This behaviour may initially foster fleeting feelings of control and accomplishment, yet it inadvertently deepens the cycle of negative self-perception. As they continue to exercise compulsively, the need to fulfil these stringent expectations grows, perpetuating a damaging loop that erodes self-esteem and promotes an unhealthy relationship with fitness and body image (Davis, 1999).

Preoccupations with one's appearance and body shape can ignite intense psychological distress and anxiety, creating a complex web of emotional turmoil. This state of mind is often intricately linked to the phenomenon of exercise addiction, in which the motivation for physical activity shifts significantly (Wang et al., 2025). What begins as a pursuit of health and enjoyment transforms into a relentless quest to alleviate anxiety and adhere to societal standards of beauty. In this context, exercise ceases to be a source of joy and wellness, becoming instead a means of coping with deep-rooted insecurities and the pressing need to conform to idealized images (Wang et al., 2025).

The interplay between a negative body image and exercise addiction creates a precarious landscape, one that can significantly elevate the likelihood of developing related issues, including disordered eating behaviours and full-blown eating disorders. This combination can lead to a cycle of harmful patterns that affect both physical and mental well-being, underscoring the importance of a balanced perspective on health and fitness (Reinboth et al., 2022).

The atmosphere of a fitness centre, while designed to promote health and well-being, can inadvertently foster negative body image issues among its members. This is often driven by factors such as social comparison, idealized marketing, and a pervasive focus on appearance. Research indicates that, although regular exercise can enhance self-esteem and overall confidence, the environment within these centres may also evoke feelings of anxiety and discontent. Such pressures can lead individuals to develop unhealthy behaviours, including disordered eating patterns and excessive exercise routines, as they navigate the often-unrealistic standards set by both peers and the media (Gjestvang et al., 2024).

There exists a profound and bidirectional relationship between exercise addiction and disordered eating behaviours among dedicated fitness enthusiasts. Individuals who become deeply entrenched in exercise addiction often display symptoms associated with various eating disorders (EDs), such as anorexia nervosa, bulimia nervosa, and orthorexia. This intricate connection highlights how the pursuit of physical perfection can lead to a troubling overlap between rigorous exercise regimens and unhealthy eating patterns, further complicating the landscape of mental and physical health for those affected.

In this study, we aimed to explore the prevalence of exercise addiction among Malaysians, with a particular focus on those who are passionate about fitness and regularly frequent gym facilities. We sought to understand the intricate relationship between exercise addiction and various psychological factors, including body image perception, eating disorder behaviours, and levels of psychological distress. Through this investigation, we hoped to shed light on how these elements interact and ultimately affect the well-being of fitness enthusiasts.

METHODOLOGY

Research Design

This study utilized a quantitative research design, specifically employing a questionnaire survey method to examine the relationship between exercise addiction, body image perception, eating behaviour, and psychological distress among fitness centre users in Klang Valley.

Participants

Purposive sampling, a non-probability sampling technique, was used to select participants from three different fitness centres in Klang Valley. According to the Google Maps application, there are a total of 130 actively operating fitness centres in this area. The three fitness centres selected for this study were SWET Fitness, My Addict Fitness, and Anytime Fitness Kelana Jaya. The total population was estimated at approximately 9 million. For the purpose of this study, 3% of the population was considered as the effective target population, resulting in an estimated population size of 270,000. According to the Krejcie and Morgan (1970) sample size determination table, a population of this size would require a minimum sample of 384 respondents at a 95% confidence level. However, this study adopted a 90% confidence interval with a margin of error of 5.3%. Under these parameters, a reduced sample size of 242 respondents was considered statistically sufficient to represent the target population.

Measurements

The instrument chosen for this research consisted of a set of questionnaires divided into six sections: Sections A, B, C, D, E, and F. Section A gathered demographic information from respondents, including age, gender, employment status, frequency of gym visits per week, and Body Mass Index (BMI), which was calculated based on height and weight. Section B utilized the Exercise Addiction Inventory Questionnaire (EAI) developed by Terry (2004). This instrument demonstrates strong reliability and convergent validity for determining individuals affected by or at risk of exercise addiction (Sahar Khoshro et al., 2024). The EAI consists of 6 items rated on a five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree). Scores of 24 points or more are classified as being at risk of addiction. Scores from 13 to 23 define an individual as being symptomatic whereas scores from 0 to 12 are considered to reflect an asymptomatic condition.

Section C featured the Body Image Questionnaire (BIQ-19) adapted from Bruchon-Schweitzer (1987), which includes 19 items designed to explore perceptions, feelings, and attitudes towards the body. The scoring for the BIQ involves favourable items—1, 6, 7, 9, 10, 12, 14, 16, and 18—rated on a scale from 1 to 5, while unfavourable items—2, 3, 5, 8, 11, 13, 15, 17, and 19—utilize reverse scoring from 5 to 1. For item number 4, respondents' gender is taken into account: females (feminine) receive scores favouring 5, 4, 3, 2, 1, while males (masculine) are scored favouring 1, 2, 3, 4, 5. Higher scores correlate with greater body satisfaction whereas 19 to 37 as faulty body image, 38 to 56 as poorly invested body image, 57 to 75 as satisfactory body image and 76 and above as very satisfactory body image. Section D applied the Self-Regulation Eating Behaviour Questionnaire (SREBQ) by Kliemann et al. (2016), which comprises five items rated on a 5-point Likert scale (1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Frequently; 5 = Always). Three questions within the SREBQ include reverse statements, which are scored inversely from 1 (always) to 5 (never) with the total mean score below 2.8 define as low self-regulation, 2.8 to 3.6 as moderate and 3.6 above as high.

Section E included the Beck Anxiety Inventory (BAI) developed by Aaron T. Beck et al. (1988). The BAI consists of 21 questions scored from 0 (“Not at all”) to 3 (“Severely/I could barely stand it”). Total scores are calculated by summing the 21 items, with ranges indicating symptom severity: 0 to 7 for minimal symptoms, 8 to 15 for mild symptoms, 16 to 25 for moderate symptoms, and 26 to 63 for severe symptoms. Section F used the Beck Depression Inventory (BDI), which consists of 21 questions where scores are categorized as follows: 0 to 9 indicates minimal depression, 10 to 18 indicates mild depression, 19 to 29 indicates moderate depression, and 30 to 63 indicates severe depression. Higher total scores reflect more severe depressive symptoms.

Procedures

Ethics approval from the Research Ethic Committee of UiTM Shah Alam campus to ensure research authenticity. All questionnaires were sent out to the participants via Google Form link. Participants received

the Google Form link at the registration counter at three different fitness centres, and the questionnaire survey took around 15 to 20 minutes to complete.

Data Analysis

Data analysis was conducted using SPSS Statistics software version 26. Descriptive and inferential analyses were performed. Descriptive analysis will interpret demographic data, including age, gender, frequency of gym visits in a week, and body mass index (BMI), expressing these variables in terms of means and standard deviations. Descriptive statistics will also determine the levels of exercise addiction, body image perception, eating behaviour, and psychological distress. Additionally, Pearson's correlation coefficient and multiple linear regression will be employed to identify relationships among the variables of exercise addiction, body image perception, eating behaviour, and psychological distress.

RESULTS

Descriptive statistics

Table 1: Demographics of Respondents

Demographic	**Overall** (n=242)	**Female** (n=123)	**Male** (n=119)
Age	28.5 ± 7.0	28.1 ± 7.1	28.9 ± 6.9
Body Mass Index (BMI)			
Underweight	3	1	2
Normal Weight	183	90	93
Overweight	53	30	23
Obese	3	2	1
Frequency of gym visits per week			
1-2 days	84 (34.7%)	45 (18.6%)	39 (16.1%)
3-5 days	111 (45.9%)	54 (22.3%)	57 (23.6%)
6-7 days	47 (19.4%)	24 (9.9%)	23 (9.5%)

Table 2: Exercise addiction, body image satisfaction, eating behaviour, anxiety and depression levels of respondents.

Demographic	**Overall** (n=242)	**Female** (n=123)	**Male** (n=119)
Exercise addiction			
No Symptoms	5 (2.1%)	4 (3.3%)	1 (0.8%)
Symptomatic	101 (41.7%)	50 (40.6%)	51 (42.9%)
At Risk	136 (56.2%)	69 (56.1%)	67 (56.3%)
Body image satisfaction			
Faulty (19-37)	0 (0%)	0 (0%)	0 (0%)
Poorly invested (38-56)	108 (44.6%)	54 (43.9%)	54 (45.4%)
Satisfactory (57-75)	132 (54.6%)	68 (55.3%)	64 (53.8%)
Very satisfactory (>76)	2 (0.8%)	1 (0.8%)	1 (0.8%)
Eating Behaviour			
Low-self regulation	58 (24.0%)	28 (22.8%)	30 (25.2%)
Moderate-self regulation	155 (64.0%)	81 (65.8%)	74 (62.2%)

High-self regulation	29 (12.0%)	14 (11.4%)	15 (12.6%)
Anxiety level			
Minimal	9 (3.7%)	5 (4.1%)	4 (3.4%)
Mild	6 (2.5%)	3 (2.4%)	3 (2.5%)
Moderate	27 (11.2%)	12 (9.8%)	15 (12.6%)
Severe	200 (82.6%)	103 (83.7%)	97 (81.5%)
Depression level			
Minimal	8 (3.3%)	5 (4.1%)	3 (2.5%)
Mild	5 (2.1%)	3 (2.4%)	2 (1.7%)
Moderate	93 (38.4%)	45 (36.6%)	48 (40.3%)
Severe	136 (56.2%)	70 (56.9%)	66 (55.5%)

Relationship Between Variables

Table 3: Correlation between exercise frequency with exercise addiction, body image perception, eating behaviour and psychological distress (anxiety and depression)

	r (df = 240)	*p*
Exercise Addiction	.147	.022
Body Image Perception	.0311	.630
Eating Behaviour	.015	.816
Anxiety	.27	< .001
Depression	.097	.132

Table 4: Multiple Linear Regression between exercise frequency with exercise addiction, body image perception, eating behaviour and psychological distress (anxiety and depression)

R	**R^2**	**Adjusted R^2**	**F**	***p***
.26	.07	.07	18.84	< .001

Table 5: Correlation between Body Mass Index (BMI) with exercise addiction, body image perception, eating behaviour and psychological distress (anxiety and depression)

	r (df = 240)	*p*
Exercise Addiction	.0298	.645
Body Image Perception	.00985	.879
Eating Behaviour	.0459	.477
Anxiety	.0487	.451
Depression	.0674	.296

Table 6: Multiple Linear Regression between body mass index (BMI) with exercise addiction, body image perception, eating behaviour and psychological distress (anxiety and depression)

R	**R^2**	**Adjusted R^2**	**F**	***p***
.03	.00	.00	1.10	.296

Table 7: Correlation between exercise frequency and body mass index (BMI)

	r (df = 240)	*p*
Body Mass Index (BMI)	.0397	.539

Table 8: Multiple Linear Regression between exercise addiction with body image perception, eating behaviour and psychological distress (anxiety and depression)

R	R^2	Adjusted R^2	F	*p*
.22	.005	.005	13.44	< .001

DISCUSSION

Table 1 provides an overview of the demographic characteristics of the respondents. Of the 242 respondents, 123 (50.8%) were females, and 119 (49.2%) were males. Notably, the average age of all respondents was 28.5±7.0 years, with females at 28.1±7.1 years and males at 28.9±6.9 years. Participants' body mass index (BMI) revealed that 183 individuals (75.6%) were classified as having a normal weight. In contrast, only 1.2% of respondents were categorised as underweight. Additionally, a substantial 21.9% of individuals fell into the overweight category, while three individuals (1.2%) were classified as obese. This highlights the varying levels of weight management within the sample. For gym users, the BMI categories for overweight and obesity are defined using the same standard ranges as those for the general adult population. However, it is essential to note that BMI does not differentiate between fat and muscle mass, which can lead to misleading classifications for individuals with high muscle mass, such as athletes and dedicated gym-goers. Consequently, someone with a BMI in the "overweight" or "obese" category may not accurately reflect their body fat percentage or overall health (Wan Nudri et al., 2009). Regarding gym attendance frequency, 158 respondents (65.3%) reported exercising at least 3 times per week, with 63.4% among females and 67.2% among males, demonstrating a commitment to regular physical activity.

Table 2 provides a detailed descriptive analysis of exercise addiction, body image perception, eating behaviour, anxiety and depression among fitness centre users. The findings reveal that a significant portion of respondents, 101 individuals (41.7%), are experiencing symptoms indicative of exercise addiction, while 136 (56.2%) were at risk of exercise addiction. This suggests a concerning trend in which exercise is pursued at the expense of overall well-being. Between genders, no difference in exercise addiction was found when 56.1% of females and 56.3% of males showed a risk of exercise addiction. Exercise addiction is a phenomenon that often emerges among avid fitness centre or gym enthusiasts. While engaging in physical activity is generally regarded as a beneficial pursuit, the addiction can take root when an individual's exercise habits evolve into compulsive behaviours, leading to detrimental physical and psychological effects. One of the primary difficulties in recognising this addiction lies in the societal perception of excessive exercise; it is frequently viewed as a commendable and healthy lifestyle choice. This misinterpretation can obscure the reality of the underlying issues faced by those who may be struggling with their relationship to fitness (Fernández-Martínez et al., 2021). Extensive research has consistently revealed pervasive evidence of exercise addiction among individuals who frequent fitness centres. Through a combination of clinical studies, in-depth behavioural pattern analysis, and detailed self-reported symptoms, researchers have painted a comprehensive picture of this phenomenon. These studies often employ various diagnostic models to pinpoint problematic exercise behaviours that significantly disrupt daily life, drawing compelling parallels to other forms of behavioural addiction. This nuanced understanding highlights how the pursuit of fitness can sometimes evolve into a compulsive drive that hampers overall well-being and daily functioning (Trott et al., 2020). Clinical diagnostic models, like the Exercise Addiction Inventory (EAI), identify exercise addiction based on specific criteria. For gym-goers, key findings include high prevalence, a significant number of fitness centre users may be at risk for exercise addiction, with rates varying by factors such as sample size and sport type; withdrawal symptoms, when many people experience anxiety, irritability, and restlessness when they cannot work out. Participants in one study reported feeling moody if they missed a session; tolerance, some need to exercise longer or harder to achieve the same mood boost or sense of accomplishment; loss of control, when those addicted to

exercise often train longer or harder than intended and struggle to reduce their habits; and rigid behavior, when individuals may develop strict routines, with their lives revolving around the need to work out, leaving little room for flexibility (Lichtenstein et al., 2017).

When it comes to body image, an overwhelming majority of respondents—134 individuals, representing 55.4%—reported being satisfied with their appearance. However, 43.9% of females and 45.4% of males reported dissatisfaction with their body image, indicating that males were more concerned about body dissatisfaction than females. These findings did not align with those of Voelker et al. (2015), who found that females are particularly susceptible to body dissatisfaction. However, perceptions of body image differ between females and males: males are more focused on muscularity, while females are more focused on femininity. In essence, females primarily feel pressure to be thin, leading to concerns about weight loss. In contrast, males primarily feel pressure to be muscular and strong, leading to concerns about gaining muscle mass. Societal ideals influence both genders, but they manifest as distinct, gender-specific body image concerns (Grossbard et al., 2008). This vulnerability is often exacerbated by pervasive weight-related criticism from both peers and societal standards, underscoring the significant pressures many face regarding their physical appearance. Strong evidence from various studies indicates that body image issues are prevalent among fitness centre users. This situation is influenced by factors such as social comparison, the aspiration to meet certain body ideals, and the gym environment itself (Yesildemir & Tek, 2022).

When examining eating behaviours, the data indicated that 58 respondents (24.0%) demonstrated a tendency toward unhealthy eating patterns. Females showed 22.8% tended a poor diet, while males recorded 25.2%. Men are more likely to exhibit irregular eating patterns, such as meal skipping and uncontrolled eating, especially when their body fat ratio is higher. Men often report feeling hungry in the late afternoon and before dinner. Women tend to display greater meal regularity and are more likely to eat alone as they age. They often report feeling hungry in the morning. Women are also more likely to restrict their eating due to body image concerns (Gorini et al., 2025).

In terms of psychological distress, the data reveal a troubling picture, with severe anxiety reported by 200 individuals (82.6%) and severe depression affecting 136 respondents (56.2%). These high levels of distress may be influenced by social factors, as noted by Viertiö et al. (2021), which highlight the impact of various societal roles and responsibilities. Specifically, females in full-time employment often face considerable challenges in balancing work and family obligations, contributing to these increased levels of psychological unease. However, our findings reported a much higher percentage of severe anxiety and depression compared to the findings reported by Viertiö et al. (2021). Women reported experiencing more psychological distress than men. The factors most strongly associated with psychological distress included loneliness, job dissatisfaction, and conflicts between family and work. On the other hand, protective factors that contributed to well-being included having children, active participation in family life, successfully balancing work and family roles, and receiving social support. A significant interaction with gender was observed in only two areas: for women, neglecting family responsibilities due to being absorbed in work was linked to increased distress, while for men, it was the mental strain from work that was associated with distress (Viertiö et al., 2021).

In table 3, the Pearson's correlation analysis revealed that exercise frequency was positively but weakly associated with exercise addiction (r = .147, p = .022), suggesting that individuals who exercise more frequently may have a slightly higher risk of developing compulsive exercise behaviours. This finding aligns with the behavioural addiction framework, which posits that exercise can become pathological when performed compulsively, particularly to regulate mood or appearance rather than for health (Szabo et al., 2025). In contrast, exercise frequency showed no significant relationship with body image perception (r = .031, p = .630) or eating behaviour (r = .015, p = .816), indicating that how often individuals exercise does not necessarily reflect their satisfaction with body appearance or eating patterns. This is consistent with evidence that body image and eating behaviours are influenced by multiple cognitive, emotional, and sociocultural factors, and that exercise frequency alone may not capture these dimensions (Tey et al., 2025).

Notably, exercise frequency was moderately positively correlated with anxiety (r = .270, p < .001), suggesting that individuals with higher anxiety symptoms may engage in more frequent exercise, possibly as a coping strategy, although the directionality cannot be inferred from cross-sectional data (Du Xingbin et al., 2024). Finally, the relationship between exercise frequency and depression was non-significant (r = .097, p = .132), implying that frequency alone may not influence depressive symptoms, which are multifactorial and affected by biological, psychological, and social factors. Overall, these results highlight that while frequent exercise can confer mental health benefits when performed in moderation, excessive frequency may signal potential risk for exercise addiction or be associated with elevated anxiety. Interventions should therefore consider exercise motivation, psychological wellbeing, and behavioural context, rather than focusing solely on exercise frequency.

Table 4 provides the multiple linear regression revealed that exercise frequency had a weak but collectively significant effect on exercise addiction, body image perception, eating behaviour, and psychological distress (R^2 = .07, F = 18.84, p < .001). Although the variance explained is modest, this suggests that exercise frequency contributes meaningfully when considered across these psychosocial outcomes. This aligns with behavioural and biopsychosocial frameworks, which emphasize that exercise behaviours are shaped by complex psychological, cognitive, and sociocultural factors. Consistent with prior research, exercise frequency alone shows only modest associations with exercise addiction, body image, eating patterns, and mental health, reinforcing the need to **assess** motivations, emotional regulation, and body-related cognitions alongside exercise behaviour (Wang et al., 2025).

The present correlations in Table 5 indicating no significant relationships between BMI with exercise addiction (r = .0298, p = .645), body image perception (r = .00985, p = .879), eating behaviour (r = .0459, p = .477), anxiety (r = .0487, p = .451), or depression (r = .0674, p = .296) suggest that BMI alone is a poor predictor of these complex psychological and behavioural outcomes. These findings are consistent with extensive research showing that while BMI is a widely used anthropometric measure of body weight relative to height, it does not capture the multifaceted psychological experiences of individuals, such as motivations for exercise, body dissatisfaction, or emotional eating, which are influenced by a broad range of cognitive, emotional, and sociocultural factors rather than body mass and that BMI may not capture subjective experiences of body dissatisfaction or exercise motives (Hausenblas & Symons-Downs, 2002). The findings underscore the importance of assessing psychological and behavioural dimensions directly rather than relying solely on BMI as an indicator of wellbeing.

The multiple linear regression results in Table 6 showed that BMI did not significantly predict exercise addiction, body image perception, eating behaviour psychological distress (anxiety and depression) (r = .03, R^2 = .00, F = 1.10, p = .296), suggesting that body mass, as measured by BMI, is not a strong determinant of these psychosocial outcomes in this sample. This aligns with a body of research indicating that BMI alone is a poor predictor of psychological constructs such as body image dissatisfaction, eating behaviours, and mental health, because these outcomes are shaped more strongly by subjective perceptions, emotional regulation, and sociocultural influences rather than just body weight as example inconsistent associations observed in large population studies and reviews on BMI and mental health (Noushin Rostampour et al., 2022).

Table 7 showed the Pearson's correlation exercise frequency and BMI was non-significant (r = .0397, p = .539), indicating that the frequency of exercise does not have a meaningful linear relationship with body mass in this sample. This aligns with evidence that BMI, as an anthropometric measure, often does not reflect individual exercise behaviours, particularly because body weight is influenced by multiple factors including diet, metabolism, genetics, and body composition, rather than exercise frequency alone (Swift et al., 2014). Theoretically, the energy balance model suggests that changes in body weight depend on the net effect of energy intake and expenditure therefore, frequency of exercise without accounting for intensity, duration, or caloric intake may not substantially affect BMI. Furthermore, research has shown that individuals with higher exercise frequency do not necessarily have lower BMI, as compensatory behaviours

such as increased caloric intake or lower non-exercise activity may offset the energy expenditure from exercise (Pontzer et al., 2016). In real-world terms, these findings suggest that exercise frequency alone is an insufficient predictor of body mass, highlighting the need for holistic approaches in interventions aiming at weight management, which consider dietary patterns, physical activity quality, and metabolic factors alongside exercise frequency.

The multiple linear regression analysis in Table 8 indicated that body image perception, eating behaviour, and psychological distress collectively predicted exercise addiction, albeit explaining only **0**.5% of the variance ($R^2 = .005$, $F = 13.44$, $p < .001$). This suggests that while these psychosocial factors are statistically significant contributors, their individual impact on exercise addiction is relatively small in this sample, highlighting the multifactorial nature of exercise addiction. The finding aligns with the behavioural addiction framework and the biopsychosocial model, which posit that exercise addiction arises from complex interactions between cognitive, emotional, and social factors, rather than from a single determinant (Wang et al., 2025). Previous research has consistently shown that body dissatisfaction, disordered eating behaviours, and elevated anxiety or depressive symptoms are associated with higher risk of compulsive exercise, though effect sizes are often modest due to the involvement of additional mediators such as personality traits, coping strategies, and cultural influences (Trott et al., 2020). Practically, these results underscore the importance of holistic assessments and interventions targeting multiple psychological and behavioural dimensions rather than focusing solely on one factor when addressing exercise addiction risk.

CONCLUSION

In summary, the present study demonstrated that exercise frequency was significantly and positively correlated with exercise addiction ($r = .147$, $p = .022$) and anxiety symptoms ($r = .270$, $p < .001$), whereas correlations with body image perception, eating behaviour, depression, and BMI were non-significant. Furthermore, exercise frequency showed a weak but collectively significant effect on a combined profile of exercise addiction, body image, eating behaviour, and psychological distress ($R^2 = .07$, $F = 18.84$, $p < .001$), while BMI did not significantly predict these outcomes. These results suggest that higher exercise frequency may be associated with risk markers for compulsive exercise and heightened anxiety, but that frequency and body mass alone are insufficient to explain broader psychosocial wellbeing. Given these findings, practitioners and fitness stakeholders should incorporate regular screening for exercise addiction and anxiety symptoms in gym and sport settings, using validated tools such as the Exercise Addiction Inventory (EAI) and brief anxiety measures paired with routine fitness assessments. Additionally, gym managers and coaches should prioritise mental health awareness and education by offering workshops on healthy exercise habits, promoting balanced training goals, and providing referrals to counselling services when signs of compulsive behaviour or psychological distress emerge. Integrating such psychosocial monitoring into fitness programming can help mitigate risk factors and support holistic wellbeing among exercisers.

AUTHORS' CONTRIBUTION

All authors participated in the final approval of the manuscript.

CONFLICT OF INTEREST

The authors have no relevant financial or non-financial interests to disclose.

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