Body Image Perception, Eating Disorders and Exercise Addiction among Malay Female College Athletes

Razali Mohamed Salleh, Nur Nayli Fatihah Rosli

Faculty of Sport Science and Recreation, University Technology Mara

DOI: https://dx.doi.org/10.47772/IJRISS.2025.909000446

Received: 09 September 2025; Accepted: 15 September 2025; Published: 14 October 2025

ABSTRACT

Physical attractiveness is a significant aspect of human nature. Failing to achieve a desired stereotyped body image may lead to body dissatisfaction, eating disorders, and exercise addiction. To understand this, 221 female college students, aged between 19 and 25, voluntarily participated in a survey by responding to questionnaires that included the Body Shape Questionnaire (BSQ), Eating Attitudes Test (EAT-26), and Exercise Dependence Scale (EDS) questions. There was a moderately significant correlation between perceptions of body image with exercise dependence (r= 0.438, p= 0.000) and eating disorders (r= 0.329, p= 0.000). There was a moderate positive correlation between exercise dependence and eating disorders (r=0.333, p=0.000). In conclusion, eating disorders and exercise can be the tools to predict misconceptions of body image among female students.

INTRODUCTION

Body image refers to a person's perception of their own body, regardless of their actual appearance. It is a complex concept that includes self-observations, thoughts, emotions, memories, fantasies, and behaviours related to one's body, both conscious and unconscious [1]. Body image encompasses how individuals perceive or envision their bodies and how they believe others perceive these perceptions. Gender and societal standards can significantly influence perceptions of the ideal physique [2]. A person may have a poor body image when they become preoccupied with perceived physical flaws. Body image misperception is commonly observed among individuals and is a significant factor in various mental health issues, such as obsessive-compulsive disorders and eating disorders. For example, a study conducted in India found that many women misperceive their weight [3]. This misperception can lead to concerns about body image, eating disorders, and harmful eating habits [4]. When there is a discrepancy between an individual's perception of their body and the ideal image they aspire to, it can result in body dissatisfaction. Distortions in body image can be uncomfortable and may lead to severe consequences. Poor body image can hurt both physical and psychological health, affecting self-esteem, mood, and social and occupational functioning [5].

Eating disorders are psychiatric conditions characterised by abnormal eating habits and disturbed patterns of food intake [6]. Research indicates that young people, particularly college students, are at a greater risk of developing eating disorders. Studies focusing on university athletes have revealed concerning trends, including skipping meals, inadequate energy and nutrient intake, and low levels of nutritional awareness [7]. Eating disorders can significantly impact the health and quality of life of those affected, as well as their caregivers and society as a whole. Research in a modern country shows that individuals with eating disorders have a substantially poorer quality of life compared to those without such disorders [8].

Exercising regularly can have significant benefits for both physical and mental health, contributing positively to overall quality of life. However, excessive exercise may impair these positive effects. Experts have identified four levels of exercise engagement: recreational, at-risk, problematic, and addictive. At these different levels, exercise can lead to mood-enhancing effects, boost self-esteem, and alleviate depression and anxiety through mechanisms like the release of catecholamines and endorphins [9]. There is an association between eating disorders and exercise addiction through multiple pathways, such as insomnia, sleep quality, psychological distress, and body image concerns [10].

The exercise addiction phase involves exercising to such an extent that it results in the neglect of other essential responsibilities, causing clinically significant distress or impairment in one or more areas of functioning [11]. Seven criteria characterise exercise addiction: 1. A need for increasing amounts of exercise (tolerance), 2. Experiencing adverse effects upon cessation of exercise (withdrawal), 3. Difficulties in reducing exercise (impaired control), 4. Challenges in sticking to planned exercise routines (intentions), 5. Spending a significant amount of time preparing for, engaging in, and recovering from exercise (time), 6. Interference with other important activities (reduction in other activities), and 7. Continuing to exercise despite problems arising from it (continuance) [12].

Similarly, exercise addiction has been linked to psychological distress, depression, and emotional stress [13]. These findings suggest that exercise addiction and eating disorders might share behavioural addiction characteristics and similar health consequences. These associations may be partially explained by proposed biological mechanisms, such as the stimulation of dopaminergic brain structures that connect mood and exercise [14]. Additionally, there are associations between exercise addiction and body image concerns, including body dysmorphic disorder [15].

While exercising remains beneficial, excessive engagement can be harmful, particularly for young females. They may be particularly concerned about body image, which can impact their eating behaviours, sleep, and psychological health. This paper aims to explore the body image concerns in the relationship between exercise addiction and eating disorders among young female athletes.

METHODOLOGY

Participant and Procedure

The participants in this study were female student-athletes of a university in Shah Alam, Malaysia. This population was selected due to the limited empirical information regarding the mechanisms that link exercise addiction and eating disorders in this group, despite a significant body of literature indicating a high prevalence of these issues. Female students were eligible for inclusion in the study if they (1) were aged above 18 years, (2) represented faculty or college in sporting events, and (3) provided a signed assent and consent form themselves.

Female students were recruited by convenience sampling. According to the university's records, there were 321 female student-athletes. Based on Krejcie and Morgan's (1970) [16] table, the sample size was set at 221, considering a 20% dropout rate. Questionnaires assessing demographic, anthropometric information, body image perception, eating attitudes, and exercise addiction were distributed online to participants. Participants' anonymity and their responses to questionnaires were classified, and they were given the option to withdraw from the study at any time without facing any repercussions. The study was approved by the university's ethics committee (reference no.: FERC/05/2023 (PG/MR/00223).

Body Shape Questionnaire (BSQ)

BSQ was developed by Cooper et al. (1987) [17] and is a self-completion test consisting of 34 questions that aim to evaluate the subject's concern regarding their weight and physical appearance. The items are responded to on a 6-point Likert-type scale, ranging from 1 (never) to 6 (always). After summing the points for each question, the classification of body dissatisfaction levels will be assessed according to the score: less than 80 points indicates the absence of dissatisfaction, 80 to 110 points indicate slight dissatisfaction, 110 to 140 points indicate moderate dissatisfaction, and a score above 140 points indicates severe body dissatisfaction. The evaluation was performed by considering the physical fitness and concerns expressed during the last four weeks of the data collection. In a previous study, Cronbach's alpha for the 34 items was 0.95 [18].

Eating Attitude Test (EAT-26)

EAT-26 was used to determine risk for eating disorders [19]. It consists of 26 scales in three dimensions: dieting, bulimia and food preoccupation, and oral control. A score greater than 20 has a risk of an eating disorder. The reliability of EAT-26 was 0.77 to 0.83 [20].

Exercise Dependence Scale (EDS)

EDS assesses symptoms of exercise dependence using a 21-item questionnaire. This scale was developed based on proposed criteria for exercise dependence [21]. Participants rated each item on a six-point Likert scale, ranging from "never (1)" to "always (6)." Scores are categorised as follows: 1) a score of 0 to 42 indicates asymptomatic (no symptoms of exercise dependence), 2) a score of 43 to 84 indicates mild exercise dependence, and 3) a score of 85 to 126 indicates exercise dependence. Higher scores on the EDS reflect a greater number of symptoms of exercise dependence. In a previous study, the scale demonstrated good reliability, with a Cronbach's alpha of 0.87 [22].

Statistical analysis

We used means, standard deviations (SD), and percentages (%) to describe the characteristics of the participants. To examine the relationships between body image concerns, eating disorders, and exercise addiction, Pearson's correlations were calculated. The correlation values were classified as small (r = 0.10), medium (r = 0.30), and high (r = 0.50) according to Cohen (1992) [23]. In this study, body image concern served as the mediating variable, exercise addiction was the independent variable, and eating disorder was the dependent variable. All statistical analyses were conducted using SPSS version 20 (IBM Corporation), with a significance level of 0.05.

RESULTS AND DISCUSSION

Table 1 indicates that the participants had an average age of 21.7 years (SD = 1.8) and 2.2 years of college education (SD = 0.9). The average BMI was 23.1 (SD = 4.4) kg/m², with 58.8% of participants having a normal BMI, 14% being underweight, 20.8% overweight, and 6.3% obese.

Table 1. Demographic data of malay female college athletes (n=221).

Characteristics	Mean ± SD	Note
Age (year)	21.7±1.8	Range 19-25
College education year	2.2±0.9	Range 1 - >4
BMI (kg/m^2)	23.1±4.4	<18.5 (14%) 18.5-24.9 (58.8%) ≥25.0-29.9 (20.8%) ≥ 30 (6.3%)

The body perception level among students was measured at an average of 2.751, with a standard deviation of 1.158. The data on body satisfaction revealed that 48 students (21.7%) reported no dissatisfaction. In contrast, 38 students (17.3%) experienced slight dissatisfaction, while 56 students (25.3%) indicated moderate dissatisfaction. Notably, 79 students (35.7%) reported severe body dissatisfaction (Table 2).

Table 2. Body image perception, eating disorders and exercise dependence levels among Malay female college athletes (n=221).

	Frequency (n)	Percentage (%)	Mean (SD)
Body perception level			2.751 (1.158)
a) Absence of dissatisfaction	48	21.7	
b) Slight dissatisfaction	38	17.3	
c) Moderate dissatisfaction	56	25.3	
d) Severe body dissatisfaction	79	35.7	
Eating disorders level			1.158 (0.366)
a) < 20	186	84.2	
b) ≥ 20	35	15.8	

Exercise dependence level			1.887 (0.668)
a) Asymptomatic (no symptoms of exercise dependence)	63	28.5	
b) Symptomatic (mild exercise dependence)	120	54.3	
c) Exercise dependence	38	17.2	

The analysis of eating disorders among students revealed an average risk level of 1.158, with a standard deviation of 0.366. Among the participants, 186 students, representing 84.2%, scored below 20, indicating a lower risk for eating disorders. In contrast, 35 students, or 15.8%, scored above 20, signifying a higher risk.

The study on exercise dependence revealed a mean level of 1.887, with a standard deviation of 0.668. Among the participants, 63 students (28.5%) exhibited no symptoms of exercise dependence, classified as asymptomatic. In contrast, 120 students (54.3%) reported mild exercise dependence, categorising them as symptomatic. Additionally, 38 students (17.2%) showed signs of exercise dependence.

The analysis revealed a positive correlation among the variables, as illustrated in Table 3. Specifically, a moderate and statistically significant correlation was found between perceptions of body image and exercise dependence, with a correlation coefficient of $r = 0.438$ ($p < 0.001$). This finding indicates that individuals with a more negative perception of their body image are more likely to exhibit higher levels of exercise dependence. Similarly, there was a moderate correlation between perceptions of body image and the prevalence of eating disorders, with a correlation coefficient of $r = 0.329$ ($p < 0.001$). This suggests that those who struggle with their body image may also be at a greater risk of developing eating disorders. Additionally, the analysis found a moderate positive correlation between eating disorders and exercise dependence, with a correlation coefficient of $r = 0.333$ ($p < 0.001$). This indicates that individuals who experience eating disorders may be more prone to engaging in excessive exercise as a means of coping with their disorder. Overall, these relationships underscore the interconnected nature of body image perceptions, eating disorders, and exercise behaviours.

Table 3. Correlation coefficient of relationships between body image perception, eating disorders and exercise dependence of Malay female college athletes (n=221).

	Coefficient values		Body image perception	Exercise dependence	Eating disorders
Body image perception	r	n= 221	1	0.438	0.329
	p			0.000	0.000
Exercise dependence	r		0.438	1	0.333
	p		0.000		0.000
Eating disorders	r		0.329	0.333	1
	p		0.000	0.000	

Our study found that 35.7% of Malay female student athletes experienced severe body dissatisfaction, higher than the 25.3% reported in a previous study [24]. This rise in body image dissatisfaction among youth, especially females, is primarily influenced by negative self-perceptions [25]. Chin et al. (2020) [26] highlighted the intense desire for slimness as a significant public health issue, with greater body dissatisfaction linked to higher mental health risks. Social pressures, media influence, and sociocultural standards contribute to this desire for thinness [27].

In our study, 130 students had a normal BMI but still reported high body image dissatisfaction, consistent with previous findings that BMI influences body image perceptions [28]. The drive for thinness among young females is increasing, leading to unhealthy BMI levels [29]. Research indicates that adolescent females are at a higher risk for body image issues and eating disorders, with 39.4% of females at risk compared to 34.4% of males [20]. Concerns over body image are prevalent among athletes, with 59% of male athletes in Germany dissatisfied with their appearance [24]. Overall, body image dissatisfaction in female student-athletes is shaped by psychological, societal, and physical factors.

Youth experiencing body image dissatisfaction are at higher risk for psychological issues and irregular weight control, which can lead to eating disorders. A study of 186 students revealed that many showed potential signs

of severe eating disorders. Eating disorders are serious psychiatric conditions that negatively impact cognitive function, emotional stability, and daily activities, especially among the younger population. Factors such as stress, anxiety, low self-esteem, and body dissatisfaction are linked to disordered eating in university students [18].

This study focuses on students in sports science and management programs, where academic pressures and athletic commitments can exacerbate eating disorders. Prior research indicates that university students are susceptible to both subclinical and clinical eating disorders due to various risk factors, including peer pressure and academic stress [30, 31].

Body image issues also contribute to eating disorders, particularly in individuals who misjudge their body weight. High BMI in adolescents is associated with abnormal eating behaviours later in life [32]. While BMI can be a useful screening tool, it does not accurately reflect body fat or distribution in specific populations, such as athletes. Eating disorders are closely intertwined with mental health issues and often serve as coping mechanisms. Early detection and support from healthcare professionals are crucial for a successful recovery.

Body image perception plays a crucial role in eating disorders and exercise addiction. Individuals with distorted body images may adopt unhealthy eating habits or develop exercise dependence to cope with negative feelings. This dependence is characterized by compulsive exercise to manage weight or body shape, often affecting individuals who are dissatisfied with their typical body type. Research indicates that 17.2% of students exhibit symptoms of exercise dependence, with university students being at a higher risk, with prevalence rates ranging from 3.4% to 13.4% [33]. Many of these students struggle with confidence and shame regarding their bodies, despite attempts to change them.

Several cultural factors shape Malay women's perceptions of body image, including religious values, social traditions, media influences, and family dynamics. These elements create a complex and sometimes conflicting set of beauty standards. In Malay culture, religious influences emphasize modesty (aurat) and inner beauty over physical appearance, shaping the lifestyles of many Malay women and promoting modesty in dress and behavior. Research suggests that a strong religious faith is associated with lower body dissatisfaction among some Muslim women. This may be attributed to the fact that devout women are less exposed to Western media and experience less pressure to conform to appearance-based public scrutiny [34].

Excessive exercise without proper recovery can lead to overuse injuries like stress fractures and tendinitis. Compulsive exercisers often ignore pain signals, worsening their injuries. Additionally, exercise addiction can induce psychological stress, resulting in hormonal imbalances and immune system suppression. Research indicates that intense, continuous exercise may increase inflammation and impair healing [35].

Academic pressures significantly contribute to exercise addiction, with 54.3% of a studied group of students showing mild exercise dependence symptoms. Many students use exercise to cope with stress from financial, academic, or personal issues, despite it not addressing the root causes. Higher exercise levels correlate with lower depression and anxiety among American university students [36], and physical activity has been shown to reduce stress and depression symptoms [35]. Moreover, students often face stress from uncertainties about finances, careers, and social relationships [37].

Recognising signs of exercise addiction is essential, including working out despite injuries, prioritising exercise over other responsibilities, and feeling distressed when unable to exercise. Seeking help from a mental health professional or academic advisor can address underlying issues and promote healthier coping strategies. Balancing academic responsibilities with self-care, such as moderate exercise, is crucial for overall well-being.

In conclusion, this study reveals a significant correlation among these factors. These findings can inform interventions to prevent body image issues, eating disorders, and exercise dependence in university students. Educational programs promoting healthy eating, positive body image, and balanced exercise are essential for prevention. Future research should investigate the influence of psychological factors, such as mindset and overthinking, on these issues to develop more effective prevention strategies.

REFERENCES

1. Adams J. Understanding exercise dependence. J Contemp Psychother. 2009;39:231. doi:10.1007/s10879-009-9117-5.
2. Ahorsu DK, Imani V, Potenza MN, Chen HP, Lin CY, Pakpour AH. Mediating Roles of Psychological Distress, Insomnia, and Body Image Concerns in the Association Between Exercise Addiction and Eating Disorders. Psychol Res Behav Manag. 2023;16:2533-2542.
3. American Psychiatric Association, D.S.M.T.F. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. 5th ed. Arlington, VA: American Psychiatric Association; 2013.
4. Azman, R. I., et al. (2022). Prevalence of Development of Eating Disorders Among Adults in Malaysia. Asian Journal of Medicine and Health Sciences, 5(1), 126–131.
5. Babalou A, Salehian MH. Relationship between body image concern and dysfunctional attitudes in predicting exercise addiction among bodybuilders. Sci J Rehabil Med. 2019;8:231–240. doi:10.22037/jrm.2019.111409.1971.
6. Chan, Y. L., Samy, A. L., Tong, W. T., Islam, M. A., & Low, W. Y. (2020). Eating disorder among Malaysian University students and its associated factors. Asia Pacific Journal of Public Health, 32(6–7), 334–339.
7. Chin, Y. S., Appukutty, M., Kagawa, M., Gan, W. Y., Wong, J. E., Poh, B. K., Mohd Shariff, Z., & Mohd Taib, M. N. (2020). Comparison of factors associated with disordered eating between male and female Malaysian University students. Nutrients, 12(2), 318.
8. Cohen, J. (1992). A power primer. Psychological Bulletin, 112(1), 155–159.
9. Cooper, P., Taylor, M., Cooper, Z., & Fairburn, C. (1987). The Development and Validation of the Body Shape Questionnaire. International Journal of eating Disorders, 6, 485-495.
10. Deshmukh VR, Kulkarni AA. Body image and its relation with body mass index among Indian adolescents. Indian Pediatr. 2017;54(12):1025–8.
11. Freimuth M, Moniz S, Kim SR. Clarifying exercise addiction: differential diagnosis, co-occurring disorders, and phases of addiction. Int J Environ Res Public Health. 2011;8:4069–4081. doi:10.3390/ijerph8104069.
12. Freire, G.L.M., da Silva Paulo, J.R., da Silva, A.A. et al. Body dissatisfaction, addiction to exercise and risk behaviour for eating disorders among exercise practitioners. J Eat Disord **8**, 23 (2020).
13. Ganesan, S., Ravishankar, S., & Ramalingam, S. (2018). Are body image issues affecting our adolescents? A cross-sectional study among college going adolescent girls. Indian Journal of Community Medicine, 43(5), 42.
14. Garcia, S.C., Mikhail, M.E., Keel, P.K., Burt, S.A., Neale, M.C., Boker, S., Klump, K.L., (2020). Increased rates of eating disorders and their symptoms in women with major depressive disorder and anxiety disorders. Int J Eat Disord. 53(11):1844-1854.
15. Garner, D. M., & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. Psychological Medicine, 9(2), 273–279.
16. Hart LM, Gordon AR, Sarda V, Calzo JP, Sonneville KR, Samnaliev M, et al. The association of disordered eating with health-related quality of life in U.S. young adults and effect modification by gender. Qual Life Res. 2020;29(5):1203–15.
17. Hashim, N., Hadi Munir, N. N., Afiqah Ahmad Tarmizi, N. A., & Izwani Ahmad, N. F. (2022). Dissatisfaction about body image during social networking among university students. Malaysian Journal of Nursing, 13(04), 12–18.
18. Hausenblas, H. A., & Downs, D. S. (2002). How much is too much? The development and validation of the Exercise Dependence Scale. Psychology & Health, 17(4), 387–404.
19. 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.
20. Hosseini SA, Padhy RK. Body image distortion. In: StatPearls. StatPearls Publishing: Treasure Island, FL, USA, 9 September 2021.
21. Huo, M., & Yang, Z. (2023). Exercise, depression, and anxiety in young people: A cross-sectional survey. International Journal of Mental Health Promotion, 25(4), 551–562.

22. Jaapar, N., Ma'rof, A.A. & Abdullah, H. (2024). Relationship between Social Physique Anxiety, Body Image Dissatisfaction, Personality Types and Self-Esteem among Malaysian Young Adults. International Journal of Academic Research in Business and Social Sciences. 14(12): E-ISSN: 2222-6990.
23. Jee, Y.-S., & Eun, D. (2017). Exercise addiction and Psychophysiological Health in Korean collegiate students. International Journal of Mental Health and Addiction, 16(2), 451–465.
24. Johnson F, Wardle J. Dietary restraint, body dissatisfaction, and psychological distress: a prospective analysis. J Abnorm Psychol. 2005;114(1):119–25.
25. Kapoor, A., Upadhyay, M., & Saini, N. (2022). Prevalence, patterns, and determinants of body image dissatisfaction among female undergraduate students of University of Delhi. Journal of Family Medicine and Primary Care, 11(5), 2002.
26. Khor GL, Zalilah MS, Phan YY, Ang M, Maznah B, Norimah AK. Perceptions of body image among Malaysian male and female adolescents. Singapore Med J. 2009;50(3):303.
27. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30(3), 607–610.
28. Kristjánsdóttir, H., Sigurðardóttir, P., Jónsdóttir, S., Þorsteinsdóttir, G., & Saavedra, J. (2019). Body image concern and eating disorder symptoms among elite Icelandic athletes. International Journal of Environmental Research and Public Health, 16(15), 2728.
29. Landolfi E. Exercise addiction. Sports Med. 2013;43:111–119. doi:10.1007/s40279-012-0013-x.
30. Mallaram, G.K., Sharma, P., Kattula, D. et al. Body image perception, eating disorder behaviour, self-esteem and quality of life: a cross-sectional study among female medical students. J Eat Disord **11**, 225 (2023).
31. Reinboth, M. S., Sundgot-Borgen, J., & Bratland-Sanda, S. (2022). Exercise Dependence and Body Image Concerns Amongst Group Fitness Instructors: A Self-Determination Theory Approach. Frontiers in Psychology, 12, 816287.
32. Saleh, R. N., Salameh, R. A., Yhya, H. H., & Sweileh, W. M. (2018). Disordered eating attitudes in female students of An-Najah National University: A cross-sectional study. Journal of Eating Disorders, 6(1).
33. Suwalska J, Kolasińska K, Łojko D, Bogdański P. Eating behaviors, depressive symptoms and lifestyle in university students in Poland. Nutrients. 2022;14:1106. doi:10.3390/nu14051106.
34. Thompson, A. J., Poyrazli, S., & Miller, E. (2020). Western media and body image dissatisfaction in young women in developing nations. Eurasian Journal of Educational Research, 20(90), 1–22.
35. Yilmaz, Z., Gottfredson, N. C., Zerwas, S. C., Bulik, C. M., & Micali, N. (2019). Developmental premorbid body mass index trajectories of adolescents with eating disorders in a longitudinal population cohort. Journal of the American Academy of Child & Adolescent Psychiatry, 58(2), 191–199.
36. Zeballos, E., Todd, J.E. (2020). The effects of skipping a meal on daily energy intake and diet quality. Public Health Nutr. 23(18):3346-3355.
37. Živkov, I., Živkov, A., Živkov, M., & Škrlec, I. (2022). The prevalence of exercise dependence among students. Journal of Physical Education and Sport, 22(7), 1708–1715.