

Research Paper

The Effect of Media Literacy on Eating Disorders of Female Athletes With the Mediating Role of Body Image

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ABSTRACT

Background and Purpose: Social media play a crucial role in setting cultural standards for the ideal body, which are often unrealistic and emphasize the importance of thinness for girls. This research aimed to explore the effect of media literacy on eating disorders with the mediating role of body image of female athletes in Izeh City, Iran.

Materials and Methods: This correlational research was applied in terms of purpose. The statistical population includes all females of Izeh City who were engaged in professional and non-professional sports activities from 2021 to 2022. The samples were collected using available sampling (N=256). To collect data, we used 4 questionnaires: personal characteristics questionnaire, a standard media literacy questionnaire by Karman and Karatash (2009), a standard eating disorders questionnaire by Fairburn and Beglin (1994), and a standard body image questionnaire by Garner (2004). Its validity was confirmed using content validity and convergent and divergent validity. The reliability of the questionnaires was confirmed using the Cronbach α as follows: media literacy: 0.945, body image: 0.821, and eating disorders: 0.708. Data were tested using the Pearson correlation test and structural equation modeling.

Results: Media literacy negatively and significantly affected female athletes' eating disorders ($r=-0.196$) and body image ($r=-0.365$). Also, body image negatively and significantly affected female athletes' eating disorders ($r=-0.566$). Moreover, media literacy indirectly and significantly affected female athletes' eating disorders ($r=0.202$) with the mediating role of body image. Finally, the test of the eating disorders model based on media literacy with the mediation of body image had a good fit (GOF=0.492).

Conclusion: Considering the effect of media literacy on girls' eating disorders, the health organization should include healthy eating and the consequences of eating disorders in educational topics in schools.

Keywords: Media, Literacy, Body image, Eating disorder

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1. Introduction

Today, social media are considered the most essential tool for creating ideas and the most efficient tool for influencing the cultures and attitudes of societies [1] and all people from different social classes. It attracts people from different social classes [2]. The world of media has undergone fundamental changes. It continues to evolve, and people are bombarded with information in different ways every day [3]. Therefore, the information obtained by people affects not only their awareness but also their standard of judgment, beliefs, and attitudes from different perspectives and even people's thoughts in many fields. In such a space, the concepts of media and literacy are integrated, so people's information literacy from the media changes their attitudes, views, and interpretations of media issues [4]. Media literacy is the ability to access written and visual messages received from television, cinema, film, Internet, advertisements, etc., and how to evaluate, analyze, and transmit those messages by people [5]. Incorrect media literacy can have a negative effect on people's social life. For example, a person may perform unwitting actions, such as cosmetic surgeries, strict diets, under-eating, weight loss pills, and excessive use of cosmetic products (one of the most important eating disorders) to change the body's shape [6, 7].

Compared to ideal body images, a person's inaccurate body image may also cause these eating disorders they follow on social media. Cash and Prozinski described "body image" as a person's perception and attitude regarding physical characteristics [8]. Body image also includes perceptual, cognitive, emotional, and behavioral components [9]. Therefore, poor media literacy and inappropriate body image are the causes of eating disorders.

The Diagnostic and Statistical Manual of Mental Disorders [10] has mentioned 5 diagnostic criteria for eating disorders: anorexia nervosa, bulimia nervosa, binge eating disorder, specific eating disorders, and unspecific eating disorders. Symptoms of eating disorders include extreme fear of obesity and weight gain, which leads to restriction of eating and weight loss. Negative feelings about weight and body shape are common among all eating disorders. Anorexia nervosa and bulimia nervosa are specifically associated with a person's preoccupation with the body and obsession with weight control behaviors [7].

For women in general, the speed and ease of social comparison with friends and celebrities while using social media may be a factor in body dissatisfaction and internalization of the thin ideal body [11, 12]. For example, a study by Fredoli and Vartanian (2015) reported that the relationship between Facebook use and eating and body image concerns specifically increased with appearance comparison in general (i.e. their tendency to compare their appearance with others increased on Facebook) [1]. The online environment is full of peer images and opportunities for social comparison. Media outlets like Instagram have apps that allow users to filter or edit their images before posting. Unfavorable comparisons can (theoretically) be especially likely when young women compare their online images to their peers, unaware that their peers are editing and filtering the photos [13].

On the other hand, research has shown that celebrities and their lifestyles play a dominant and inspirational role for most young women, where many know every minute detail of celebrities, including their diet and exercise habits [14]. Research is limited on the efficacy of media literacy interventions to combat unrealistic societal standards and ideals of beauty and eating disorder prevention. Few studies evaluating these effects have focused mostly on women [15, 16]. Media literacy is essential to help people critically view media content. The results of Chalesghar-Kordasiabi studies on 370 students of Mazandaran University of Medical Sciences showed that the highest and lowest average scores were related to the dimensions of media message content understanding and media message analysis. Also, this study showed a significant relationship between the father's age, grade point average, and education level with media literacy. The researchers admitted that using social media, such as Telegram, WhatsApp, and Facebook, is significantly related to media literacy [17]. Exposure to media that promote beauty ideals affects body image, eating behaviors, and self-esteem in both men and women [18]. The literature suggests that for women, mass media are the most powerful transmitters of sociocultural ideas of beauty [19]. However, most research on mass media and its impact on body image, eating behaviors, and self-confidence has focused on the ideal images presented in print and television. However, media use is rapidly evolving, and the Internet, including social networking sites, is becoming the primary media source young adults use [12, 20]. Therefore, media literacy is a necessity for everyone. According to the stated content, female athletes are surrounded by media like other sections of society. The conceptual model of the current research is shown in Figure 1.

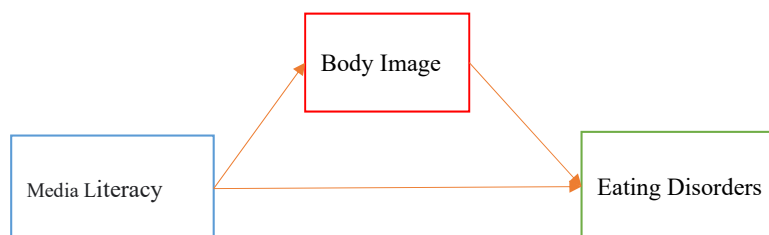


Figure 1. Conceptual model of research

They use these media to see sports models and check different nutritional supplements. Especially because sports have a strong link with the concept of media, the media literacy of athletes is more important than other people. They should understand media content and use it for quick and efficient access to information. It seems essential to critically evaluate sources and information. Therefore, this study was conducted to investigate the effect of media literacy on the eating disorders of female athletes with the mediating role of body image.

2. Materials and Methods

The present research is classified as descriptive correlational, and in terms of purpose, it is applied. The required information was collected through a questionnaire and in a field form. The study's statistical population comprises all females in Izeh City who were engaged in professional and non-professional sports activities from 2021 to 2022. A non-random available sampling method was used to determine the statistical sample of the research. A total of 280 questionnaires were distributed in all the clubs of Izeh City, and finally, 256 completed questionnaires were returned with a rate of 91.5% and were analyzed.

The inclusion criteria were participating in professional and non-professional sports activities for at least one year and having a maximum body mass index of 25 kg/m².

Based on the principle of non-abuse, the participants were forbidden to force the answers, and the findings were kept confidential according to the Declaration of Helsinki [21].

The tools of this research included four questionnaires. The first questionnaire is the individual characteristics questionnaire. The second is Karman and Karatash's (2009) standard media literacy questionnaire. This 17-question tool has three dimensions: information, the ability to analyze, and the ability to judge and recognize messages. Third is Fairburn and Beglin's (1994) standard

questionnaire of eating disorders. It has 28 items and 4 dimensions (concern about eating, concern about body weight, restriction in eating, and concern about body appearance). The last is Garner's standard body image questionnaire (2004) which has 12 items. All questionnaires were scored on a 5-point Likert scale. Also, in the present study, in order to determine the reliability of questionnaires, Cronbach's alpha coefficient method was used, and the reliability of media literacy and body image and eating disorders questionnaire was estimated as (0.945, 0.821, 0.708) respectively. Descriptive statistics were used to analyze the demographic characteristics. The skewness test was used to check the normality of data distribution. The Pearson correlation and structural equation modeling tests were used in the inferential statistics section to test research hypotheses using SPSS software, version 24 and PLS software, version 3.

3. Results

A total of 256 female athletes in Izeh City participated in this research. More than 45% of the respondents were 17 years old. More than 42.2% of the respondents were in the 12th grade. Most respondents (21.5%) used social media 2 hours a day, and a few (1.2%) used social media 9 hours a day (Table 1).

The Pearson correlation coefficient was used to establish the presuppositions of the structural equation test, the results of which are presented in Table 2. Based on the results of this test, there are significant relationships at the 0.001 level. Therefore, the assumption of the structural equation test is established, and this test can be used.

In the following, the conceptual model of the research was examined using structural equations by the method of partial least squares, where the fit of the model was examined in three parts: the fit of the measurement model, the fit of the structural model, and the overall fit of the model.

Table 1. The Individual characteristics of the respondents

Variable	No. (%)	
Respondents age (y)	15	71(27.7)
	16	55(21.5)
	17	116(45.3)
	18	14(5.5)
Grade	10 th	75(29.3)
	11 th	72(28.1)
	12 th	109(42.6)
Social media use (h)	1	44(17.2)
	2	55(21.5)
	3	32(12.5)
	4	47(18.4)
	5	36(14.1)
	6	26(10.2)
	7	9(3.5)
	8	4(1.6)
	9	3(1.2)

Three reliability criteria, convergent validity and divergent validity, are used to check the fit of measurement models. Based on the results presented in Table 3, the Cronbach α values and combined reliability, and mean extracted variance for all variables are within the acceptable range.

To check divergent validity, the Fronell-Larcker matrix method was used. In the primary diameter of this matrix, the square root of the average extracted variance of the variables is entered. This value must be more than the correlation between it and other variables to confirm the divergent validity. Table 4 shows the validity of

the appropriate variance and good fit of the measurement models.

In reviewing the structural model, the index of sharing, redundancy, coefficient of determination (R^2), and goodness of fit (GOF) is checked for the model's fit, which is reported in Table 5.

Also, the value of the goodness of fit criterion equal to 0.73 was obtained, which shows the good fit of the overall research model (Equation 1).

$$1. GOF = \sqrt{0.429 * 0.564} = 0.492$$

Table 2. Correlation between the main research variables

Variable	1	2	3
1. Eating disorders	1		
2. Body image	-0.568	1	
3. Media literacy	-0.435	-0.546	1

Table 3. Reliability and convergent validity of the measurement model

Variable	Cronbach α Coefficients	Composite Reliability	Extracted Average Variance
Eating disorders	0.854	0.885	0.500
Body image	0.851	0.883	0.501
Ability to analyze	0.966	0.972	0.854
Having information	0.941	0.953	0.747
Media literacy	0.961	0.968	0.660
Judging and recognizing the message	0.823	0.838	0.565
Restrictions on eating	0.806	0.861	0.554
Worry about eating	0.879	0.898	0.500
Concern about appearance	0.880	0.917	0.735
Concern about body weight	0.814	0.872	0.581

In addition to the materials presented to test the effect of a mediating variable, there is a widely used test called the Sobel test to determine the significance of the effect of a mediating variable in the relationship between two other variables. The Sobel test obtains a z value through the following formula. If this value exceeds 1.96, it can be confirmed that the mediating role of a variable is significant at a 95% confidence level (Equation 2).

$$z = \frac{ab}{\sqrt{(b^2 SE_a^2) + (a^2 SE_b^2)}} \quad 2.$$

$$z - \text{value} = \frac{-0.196 * -0.566}{\sqrt{(-.566x^2 \times 0.052x^2) + (-0.196x^2 \times 0.069x^2)}} = 3.452$$

The result of the test of the main assumptions of the structural model research in the case of direct relationships is shown in Table 6.

The output of the research model in the significant state of the coefficients between the main and secondary paths is shown in Figure 2.

Table 7 shows the indirect coefficient between media literacy and eating disorders through the mediation of media literacy.

Table 4. Examining the model's divergent validity by the method of Fronell and Larker

Structure	1	2	3	4	5	6	7	8	9	10
Eating Disorders	0.707									
Body image	-0.637	0.708								
Ability to analyze	0.377	-0.355	0.924							
Having information	0.432	-0.388	0.559	0.865						
Media Literacy	0.403	0.365	0.398	0.587	0.813					
Judging and recognizing the message	0.266	-0.216	0.746	0.726	0.482	0.752				
Restrictions on eating	-0.508	0.601	-0.377	-0.419	-0.398	-0.275	0.744			
Worry about eating	0.629	-0.595	0.528	0.423	0.619	0.489	-0.536	0.707		
Concern about appearance	-0.276	0.527	-0.171	-0.192	-0.167	-0.032	0.519	-0.318	0.857	
Concern about body weight	0.519	-0.514	0.268	0.343	0.311	0.242	-0.523	0.468	-0.322	0.763

Table 5. Index of sharing, redundancy, and coefficient of determination (R2) for research variables

Variables	Subscription	Redundancy	R ²
Eating disorders	0.317	0.170	0.440
Body image	0.326	0.050	0.133
Ability to analyze	0.714	0.765	0.966
Having information	0.638	0.676	0.974
Media literacy	0.577	--	--
Judging and recognizing the message	0.274	0.242	0.678
Restrictions on eating	0.332	0.172	0.370
Worry about eating	0.350	0.219	0.532
Concern about appearance	0.524	0.092	0.142
Concern about body weight	0.372	0.449	0.838

Table 6. The result of the research hypothesis test of the structural model in the case of direct relationships

Path Between Structures	Standard Coefficient	t	P	Confirm/Reject
Media literacy ----> Eating disorders	-0.196	3.974	0.001	Confirm
Media literacy ---->Body image	-0.365	4.566	0.001	Confirm
Body image ----> Eating disorders	-0.566	8.193	0.001	Confirm

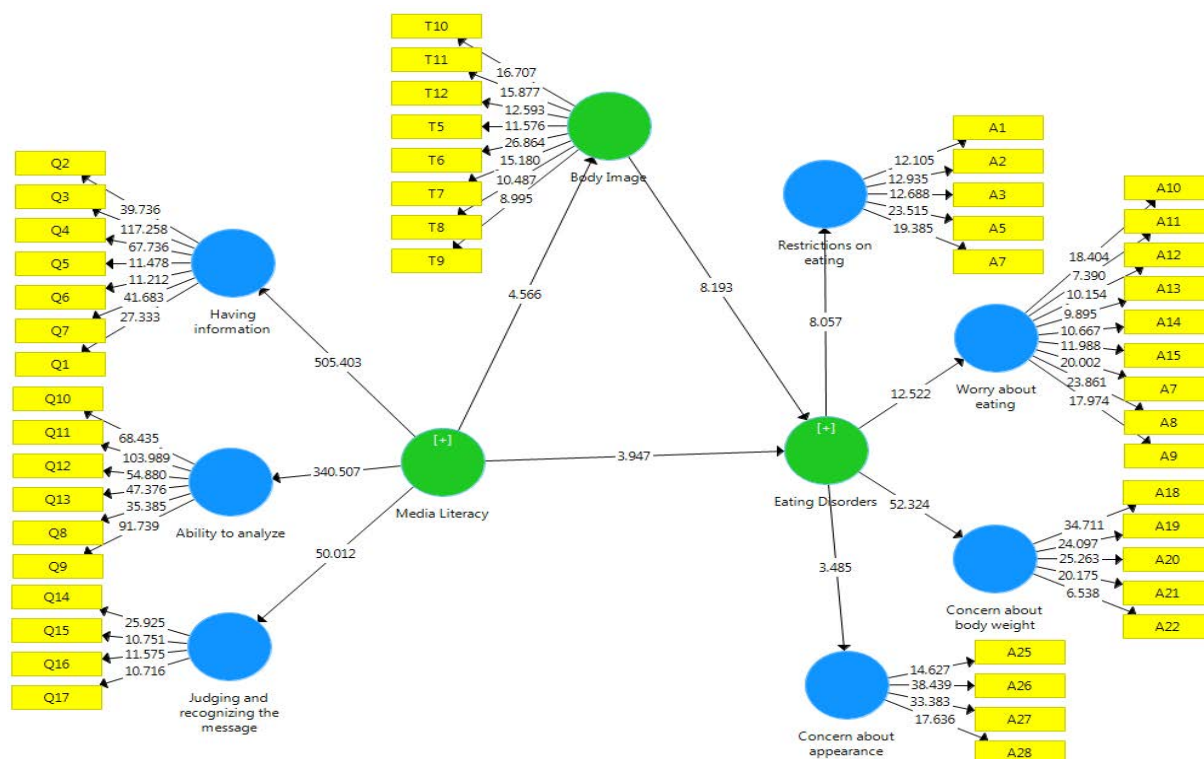


Figure 2. Model in a meaningful state

Table 7. The result of the research hypothesis test of the structural model in the case of indirect relationships

Path Between Structures	Standard Coefficient	t	P	Confirm/Reject
Media literacy ---> Body image ---> Eating disorders	0.202	3.512	0.001	Confirm

As can be seen, the z value of the Sobel test was equal to 3.425, which is greater than 1.96, so it can be stated that the mediating role of body image between media literacy and eating disorders is significant at the 95% confidence level.

4. Discussion

The main objective of this study was to investigate the effect of media literacy on the eating disorders of female athletes with the mediating role of body image. The results showed that media literacy negatively and significantly affected female athletes' eating disorders and body image. Also, body image had a negative and significant effect on the eating disorders of female athletes. In addition, media literacy had an indirect and significant effect on the eating disorders of female athletes with the mediating role of body image, and finally, the test of the eating disorders model based on media literacy with the mediation of body image had a good fit.

In this regard, Faramarzian and Ghafari Azar (2016) investigated the effect of mass media consumption on body management in young people aged 20 to 30 years in Urmia City, Iran, and the results showed that domestic media consumption has a significant negative relationship with body management. However, there was a significant and positive relationship between the use of satellite TV and body management. Therefore, with the increase in foreign media consumption, the body's management increased [22]. In South Wales, Gale et al. (2016) conducted semi-structured face-to-face interviews with 7 adult women aged 20–40 who had developed eating disorders due to using Prodiet websites. The data identified 5 key themes: fear, ambivalence, social comparisons, shame, and pro-eating disorders that perpetuate eating disorder behaviors. The results showed that pro-eating disorder websites provide support, credibility, and reassurance to people with an eating disorder. At the same time, they continue to reinforce and maintain the eating disorder behavior and do virtually nothing to help patients. They even aggravated their illness [23]. Hay et al. (2015) studied the 3-month prevalence of anorexia nervosa and bulimia nervosa in more than 6000 adults over 15 years of age. The results showed that people with eating disorders were generally younger than others; the mean age for anorexia nervosa and bulimia nervosa was in the

fourth decade and for all other disorders, in the fourth or fifth decade. Most people with eating disorders had similar household income and educational achievements to the general population. People with bulimia nervosa, eating disorders, and subthreshold bulimia nervosa were more likely to be obese than people without eating disorders [24]. Holland and Tiggemann (2016) systematically investigated the impact of using social networking sites on body image and eating disorder outcomes. The results showed that social networking sites are related to body image and eating disorders. Specific activities on social networking sites, such as viewing and uploading photos and seeking negative feedback through body status updates, were problematic. Also, the results showed that social comparison based on appearance and body image fueled more use of social networking sites and concerns about eating. Also, these problems are not related to gender as a moderating factor [25]. Kurz et al. (2022) believed that school-based interventions improve youth body image and media literacy. Their research showed that school literacy interventions can improve media literacy and reduce body dissatisfaction. Interventions that worked with the principle of inducing cognitive dissonance were the most effective [26]. Gordon et al. (2020) also studied 7- to 8-grade students from Australian secondary schools. They found that combining school awareness and health issues led to a better understanding of students when exposed to social media. The results showed that social media awareness in the first stage improved nutrition, increased muscle tissue, and reduced student body dissatisfaction. Also, in the second stage, it has reduced depression and increased self-esteem [27]. Exposure to idealized images on social media is known to have a detrimental effect on body image. Therefore, identifying and using protective factors is one of the important research centers. Building on traditional notions of media literacy, one proposed protective factor is social media literacy, using a critical analysis of the motivations behind social media posts and the constructed and generally unrealistic nature when viewing images focused on "appearance" on social media. To this end, Paxton et al. (2022) studied theoretical models of social media literacy and current measurement approaches and found that, although there are still many factors to consider, there is little initial support. Social media literacy has a protective role, especially in girls and young women [28].

Most researchers believe that modern society has increased pressure on men and women to fit the ideal body type. Many people succumb to this pressure and spend much time and money chasing these ideals. Magazines, movies, and TV shows feature advertisements, gimmicks, diets, and products that promise to be a cure-all. Misleading media messages target men and women and say that beauty is defined by being thin, slim, muscular, and attractive. You cannot be beautiful without many body changes. No one is exempt from the threats posed by this type of media exposure [29]. Although the general public is bombarded daily with negative media messages about body image, vulnerable populations can be protected from the bleak prognosis associated with eating disorders. Changing patterns at home by rejecting the diet mentality, eliminating negative body conversations, and increasing media literacy can help prevent unhealthy eating behaviors.

Also, the results showed that media literacy has a negative and significant effect on the body image of female athletes, which means that the higher the media literacy of female athletes, the lower their negative body image. These findings are consistent with the results of Fardouly and Vartanian (2015) [1], Zuair and Sopory (2022) [30], and Zeeni et al. (2021) [31].

Caution should be exercised when examining the effects of school-based and media literacy interventions on adolescent body image concerns, eating concerns, and thinness concerns and generalizing to other cultures that may have different standards of the ideal female body type [30]. Social media use may have detrimental effects on the physical and mental health of young adults, including body image dissatisfaction and changes in eating behavior. Adherence to a proper diet is essential for women's health, especially for mothers and fetuses. Using and sending social messages is related to eating behaviors. The use of social media and dependence on technological devices is associated with increasing appearance comparison and body image dissatisfaction in women. It will potentially harm women and mothers' physical and mental health [31].

Various factors influence the creation of a negative or positive body image. The three most important negative body image constructs are awareness of ideal or desirable thinness, internalization, and perceived pressure [12]. A negative body image has been shown to include excessive internalization of the ideal image of thinness and the pressures one puts on oneself to be thin. In addition, time spent on mass media (such as watching TV, playing video games, or using the computer continues)

increases every year. It is now almost twice the recommended daily limit of 2 hours per day. The literature suggests that mass media are the most vital transmitters of sociocultural ideas [19] and the strongest predictors of body dissatisfaction [32].

Also, the results showed that body image has a negative and significant effect on the eating disorders of female athletes, which means that the more negative the body image of female athletes is, the more eating disorders they have. The findings of this research are consistent with the research of Qaderyan Anarmarzi [33], Boberová and Husárová [34], Hockin-Boyers et al. [35], McLean et al. [36] and Kagie [37].

Another way to conceptualize negative body image is to define body image disorders. Sarwer described body image disorders as a term that includes all subcomponents of body image: affective, cognitive, behavioral, and perceptual features. When a person feels anxious or stressed about his appearance, this image is considered disturbing because a cognitive component describes an unrealistic expectation of a body feature. Also, the behavioral component avoids situations where a person checks his body image through behaviors, such as going to the swimming pool or working in a gym. The perceptual component is described as an overestimation of a person's characteristics. Any combination of these components can create a body image disturbance that can be classified as high or low body image disturbance and lead to an eating disorder [38].

Also, the results showed that media literacy significantly affects the eating disorders of female athletes through the mediating role of body image. The findings of this research are similar to those of Hockin-Boyers et al. [35] and MacLean et al. [36].

The media seem to put more pressure on women to achieve unattainable body standards because women are responding to the messages they receive from popular culture about beauty and physical attractiveness. In particular, women who invest heavily in their appearance are more affected when exposed to media images [30]. In addition, several empirical studies have shown that when women are exposed to media images of feminine beauty, they tend to have increased body image disturbance, are more likely to exhibit eating disorder symptoms, and have lower self-esteem. Interestingly, in one study, women exposed to media images whose self-esteem was threatened engaged in body image enhancement and used their appearance to maintain their sense of self-worth. Additionally, more

than two-thirds (68%) of women strongly agree that the media and advertising have an unrealistic standard of beauty that most women will never be able to achieve. However, other studies have found no relationship or inconsistent relationships between body satisfaction, eating disorder symptoms, self-esteem, and exposure to thin media images, with different media (e.g. television, magazines). Music videos were vaguely investigated in various studies. On the other hand, thinness is not the only measure of beauty that exists. Researchers may overlook ideal images that can be a source of body dissatisfaction [39].

5. Conclusion

The results of the present study showed; Media literacy had an indirect and significant effect on the eating disorders of female athletes with the mediating role of body image. If until yesterday, only the family and school played a role in educating children, adolescents and young people and shaping their beliefs, today the media is considered as the third factor in this field. Among these, social media has the greatest cultural influence, the emergence of new habits, changes in beliefs, and the mood and behavior of people. The motivation of users to use social media requires more attention. Social media may appear as a platform for seeking feedback. Some other motivations for using social media, such as negative social evaluations or engaging in social comparisons, may lead to inappropriate body image and body dissatisfaction, as well as eating disorders. Considering the effect of media literacy on girls' eating disorders, it is better for the health organization to include healthy eating and the consequences of eating disorders in educational topics in schools.

Ethical Considerations

Compliance with ethical guidelines

The study protocol was approved by the Research Council of the Sports Management Department of Payame Noor University, Tehran Province, Iran (Code number: 19171045).

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Authors contributions

Conceptualization and supervision, data analysis writing the original draft, review, and editing: Mohammad Hassan Ferdowsi; Collecting information: Zainab Shaholipour.

Conflict of interest

All authors declared no conflict of interest.

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