



Correlation Between Gender Differences and Anthropometric Indicators with Body Image Dissatisfaction Among Adults in Ardabil City

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Abstract

Background: Body image dissatisfaction has been rising in recent years. Despite the large body of evidence on body image, few studies have directed gender comparisons of body image in Iran.

Objectives: This study aimed to investigate body image dissatisfaction and its correlation with anthropometric indicators and body composition in men and women.

Methods: Following a cross-sectional design, 95 females and 95 males (age range: 18 - 50 years and body mass index: 18.5 - 40.0 kg/m²) who attended a nutrition clinic in Ardabil city were recruited using a convenience sampling method. Anthropometric measurements were achieved while participants were lightly clothed with no shoes. The body fat percentage, visceral fat level, and visceral fat area were measured using a bioelectrical impedance analysis. The body image was evaluated using the Multidimensional Body Self-Relation Questionnaire (MBSRQ). Data analysis was administered using SPSS, and a two-tailed P-value less than 0.05 was considered statistically significant.

Results: The appearance orientation (females: 4.04 ± 0.57 vs. males: 3.72 ± 0.49 , P-value < 0.001) and illness orientation (females: 3.70 ± 0.74 vs. males: 3.41 ± 0.83 , P-value = 0.01) subscales scores were higher in women than men. A negative association was observed between appearance orientation subscale score with anthropometric indicators and body composition. In contrast, the subjective weight, overweight preoccupation, and health evaluation subscales scores were positively correlated with anthropometric measurement and body composition.

Conclusions: This study investigated body image dissatisfaction in a small sample of Iranians. Gender was an important factor in determining body image subscales. Thus, health interventions should be specially designed.

Keywords: Gender, Anthropometric Indicator, Body Image Dissatisfaction

1. Background

Body image implies the accurate judgment of one's body shape and size and body-related feelings, thoughts, and behavior (1). Body image dissatisfaction has been reported as a severe risk factor for the development of eating disorders, depression, stress, low self-esteem, increased social anxiety, emotional distress (2), reduced appraisal of one's physical appeal, appearance rumination (3), and a tendency toward unnecessary appearance management (4). At the moment, this status has become increasingly prevalent on a universal scale (5).

Many demographic and socioeconomic factors (6), such as gender (7), age (8), marital status (9), anthropometric status (2), culture (10), and educational level (9), are

effective in body image dissatisfaction. Traditionally, researchers have focused mainly on body image in women. In recent years, however, increased attention has been paid to male body image (11). Available data express that up to 90% of women, and 61% of men are dissatisfied with their body (12). Among Iranian women, the dissatisfaction rates have also been reported by 70% (13). The association among body mass index (14), waist circumference, waist to hip ratio (15), and body image dissatisfaction has been confirmed. Few studies have considered the association between body composition and body image (2). There is still a lack of studies on the subject investigating overweight or obese individuals (16) or gender comparisons of body image (8).

2. Objectives

Based on the previous findings outlined above, we investigated body image dissatisfaction and its correlation with anthropometric indicators and body composition in a small of sample Iranian men and women.

3. Methods

This cross-sectional study was performed between October and December 2019 in the city of Ardabil, Iran. The subjects (95 females and 95 males) were recruited among those attended a nutrition clinic using a convenience sampling method. Inclusion criteria were: (1) age range: 18 - 50 years; (2) body mass index: 18.5 - 40.0 kg/m²; (3) stable body weight (weight change \pm 2 kg) three months before the initiation of the study; (4) non-pregnant, and non-lactating women; and (5) agreement to sign informed consent. Exclusion criteria included a documented history of mental disorders, taking psychotropic substances, and obesity surgery interventions.

Anthropometric measurements were achieved while participants were lightly clothed with no shoes. Weight and height were determined using a Seca digital weight scale and a wall-mounted stadiometer, respectively. Waist and hip circumference were determined as recommended by the world health organization. The body mass index, waist to hip, waist to height ratio was calculated using the following formulas: (1) weight (kg) divided by squared height (m²); (2) waist circumference (cm) divided by hip circumference (cm); (3) waist circumference (cm) divided by height (cm), respectively.

The body fat percentage, visceral fat level, and visceral fat area were measured using a bioelectrical impedance analysis (X-CONTACT 356; JAWON MEDICAL Co. Ltd., Republic of Korea).

The self-attitudinal aspects of the body-image construct were evaluated using the Multidimensional Body Self-Relation Questionnaire (MBSRQ). This questionnaire consists of 69 items that are categorized in ten subscales of appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, health evaluation, health orientation, illness orientation, body area satisfaction, subjective weight, and overweight preoccupation. All items are scored on a 5-point Likert scale, ranging from strongly disagree to strongly agree. The output is calculated through subscale mean values. The present study used the Persian version of the questionnaire with confirmed validity and reliability (17), and the principles of the Helsinki declaration were respected (18).

Data analysis was administered using SPSS software (version 21.0) by the Kolmogorov-Smirnov test to examine the distribution of variables performed by a histogram. Regarding the normal distribution of the data, parametric tests were applied to analyze the quantitative variables. The independent t-test was used to compare any significant differences for each study variable between genders. Correlations between subscales of body image and anthropometric indicators and body composition were calculated using the Pearson correlation test. A two-tailed p-value of less than 0.05 was considered statistically significant.

4. Results

For all participants, the mean weight, body mass index (BMI), waist circumference, waist to hip ratio, waist to height ratio, body fat percentage, visceral fat level, and visceral fat area were 80.26 ± 19.21 (kg), 27.93 ± 5.03 (kg/m²), 93.42 ± 14.66 (cm), 0.87 ± 0.08 , 0.54 ± 0.06 , 31.05 ± 7.13 (%), 11.14 ± 3.85 , and 107.30 ± 52.29 (cm²), respectively. Table 1 provides the anthropometric characteristics of men and women. The differences in the mean weight, BMI, waist circumference, waist to hip ratio, waist to height ratio, body fat percentage, visceral fat level, and the visceral fat area between females and males were statistically significant (P-value < 0.001).

For all participants, the mean appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, health evaluation, health orientation, illness orientation, body area satisfaction, subjective weight, and overweight preoccupation subscales scores were 3.58 ± 0.55 , 3.89 ± 0.55 , 3.4 ± 0.80 , 3.42 ± 0.67 , 3.24 ± 0.59 , 3.39 ± 0.54 , 3.55 ± 0.80 , 3.19 ± 0.79 , 3.60 ± 1.19 , and 2.66 ± 0.75 , respectively. Table 2 provides the body image subscales scores for men and women. The differences in the mean appearance orientation and illness orientation subscales scores between females and males were statistically significant (P-value < 0.001 and P = 0.01, respectively). The mean score was higher in women in both subscales.

The correlations among body image subscales, anthropometric measurement, and body composition are shown in Table 3. Based on the results, the appearance orientation subscale score was negatively correlated with anthropometric measurement and body composition. In contrast, the subjective weight, overweight preoccupation, and health evaluation subscales scores were positively correlated with anthropometric measurement and body composition.

Table 1. The Anthropometric and Body Composition Characteristics Across Gender

Variables	Mean \pm SD	P-Value
Weight (kg)		< 0.001
Female	70.56 \pm 12.77	
Male	89.97 \pm 19.72	
Body mass index (kg/m²)		< 0.001
Female	26.96 \pm 4.61	
Male	28.91 \pm 5.26	
Waist circumference (cm)		< 0.001
Female	85.00 \pm 9.40	
Male	101.30 \pm 14.34	
Waist to hip ratio		< 0.001
Female	0.82 \pm 0.05	
Male	0.92 \pm 0.08	
Waist to height ratio		< 0.001
Female	0.52 \pm 0.05	
Male	0.57 \pm 0.07	
Body fat percentage (%)		< 0.001
Female	34.20 \pm 6.04	
Male	28.10 \pm 6.84	
Visceral fat level		0.001
Female	10.15 \pm 3.95	
Male	12.07 \pm 3.53	
Visceral fat area (cm²)		< 0.001
Female	82.62 \pm 34.05	
Male	130.41 \pm 55.86	

5. Discussion

This study aimed to explore the correlation between gender differences and anthropometric indicators with body image dissatisfaction among adults. According to the findings, the appearance orientation and illness orientation subscales scores were higher in women. In these subscales, the meaning of high scores is more investment and more alert, respectively. A negative association was observed between appearance orientation subscale score with anthropometric indicators and body composition. There was a strong positive correlation between the subjective weight subscale score and the above-mentioned variables (correlation coefficient range: 0.64 - 0.86, $P < 0.001$).

Body image is a multidimensional construct that contains a person's perceptions, thoughts, feelings, and behaviors about the size, shape, and structure of a body (19). It can be influenced by media, family, and social environment directly and indirectly (20). This situation may be

Table 2. Comparison of the Body Image Subscales Scores Across Gender

Subscale	Mean \pm SD	P-Value
Appearance evaluation		0.14
Female	3.64 \pm 0.61	
Male	3.52 \pm 0.48	
Appearance orientation		< 0.001
Female	4.04 \pm 0.57	
Male	3.72 \pm 0.49	
Fitness evaluation		0.85
Female	3.65 \pm 0.82	
Male	3.63 \pm 0.78	
Fitness orientation		0.58
Female	3.39 \pm 0.74	
Male	3.45 \pm 0.59	
Health evaluation		0.32
Female	3.20 \pm 0.58	
Male	3.29 \pm 0.59	
Health orientation		0.34
Female	3.43 \pm 0.50	
Male	3.35 \pm 0.57	
Illness orientation		0.01
Female	3.70 \pm 0.74	
Male	3.41 \pm 0.83	
Body area satisfaction		0.07
Female	3.10 \pm 0.77	
Male	3.30 \pm 0.67	
Subjective weight		0.42
Female	3.53 \pm 1.19	
Male	3.67 \pm 1.18	
Overweight preoccupation		0.05
Female	2.77 \pm 0.78	
Male	2.55 \pm 0.70	

related to unhealthy behaviors and psychosocial morbidities (21). Greater body dissatisfaction has been reported in women than in men (22, 23).

In Quittkat et al.' study, the mean score for the appearance orientation scale was 3.11 ± 0.64 , 3.20 ± 0.62 , and 2.91 ± 0.64 for the total population, women, and men, respectively (8). The mean appearance orientation subscale is reported 3.84, 3.65, 3.73, 3.37, 3.29, 3.74, and 3.59 in Cyprus, France, Spain, Germany, Greece, Poland, and the Nether-

Table 3. Correlations Among Body Image Subscales, Anthropometric Indicators, and Body Composition^{a, b, c}

Variables	Weight	BMI	PBF	VFL	VFA	WHR	WC	AE	AO	FE	FO	HO	IO	BAS	SW	WP	HE
WEIGHT	1																
BMI	0.87***	1															
PBF	0.41***	0.73***	1														
VFL	0.73***	0.89***	0.73***	1													
VFA	0.77***	0.82***	0.51***	0.90***	1												
WHR	0.78***	0.79***	0.45***	0.90***	0.97***	1											
WC	0.97***	0.89***	0.46***	0.83***	0.87***	0.88***	1										
AE	-0.07	-0.08	0.04	-0.05	-0.13	-0.10	-0.08	1									
AO	-0.29***	-0.23**	-0.01	-0.23**	-0.26**	-0.28***	-0.30***	0.22**	1								
FE	-0.08	-0.10	-0.10	-0.13	-0.14	-0.15*	-0.10	0.28***	0.17*	1							
FO	-0.10	-0.12	-0.17*	-0.13	-0.13	-0.12	-0.11	0.21**	0.12	0.66***	1						
HO	-0.11	-0.08	-0.05	-0.07	-0.07	-0.08	-0.12	0.174*	0.39***	0.47***	0.48***	1					
IO	-0.11	-0.04	0.09	-0.04	-0.09	-0.10	-0.10	0.21**	0.42***	0.40***	0.41***	0.48***	1				
BAS	0.10	-0.01	0.0	0.06	0.05	0.12	0.11	0.54***	-0.03	0.23**	0.26**	0.17*	0.12	1			
SW	0.69***	0.86***	0.74***	0.80***	0.65***	0.64***	0.71***	0.01	-0.14	-0.06	-0.06	-0.05	-0.02	0.02	1		
WP	0.27***	0.38***	0.38***	0.29**	0.21**	0.17*	0.25**	-0.03	0.13	0.07	0.12	0.12	0.07	-0.07	0.48***	1	
HE	0.21**	0.20**	0.12	0.14	0.11	0.08	0.21**	0.11	-0.13	0.27***	0.32***	0.26**	0.24**	0.07	0.21**	0.10	1

Abbreviations: BMI, body mass index; PBF, body fat percentage; VFL, visceral fat level; VFA, visceral fat area; WHR, waist to hip ratio; WC, waist circumference; AE, appearance evaluation; AO, appearance orientation; FE, fitness evaluation; FO, fitness orientation; HO, health orientation; IO, illness orientation; BAS, body area satisfaction; SW, subjective weight; WP, overweight preoccupation; HE, health evaluation.

^a ***Correlation is significant at the 0.001 level (2-tailed).

^b **Correlation is significant at the 0.01 level (2-tailed).

^c *Correlation is significant at the 0.05 level (2-tailed).

lands, respectively (24). As compared to other countries, it seems that Iranians pay more attention to their appearance. It can be described by the lack of a prevention culture regarding body image. In the present study, women placed more attention on their appearance, which is in line with the findings of other studies (8, 25-27). The studied women were young in this study (mean age: 24.42 ± 3.69 years). It should be noted that the importance of appearance may decrease with age in women (28, 29), which should be considered.

Typically, young women desire to attain a thin body image. This condition may be associated with dieting, dysfunctional exercising, purging, and laxative use (30), while men like to achieve a muscular/athletic body (31). These desires may be associated with excessive exercising and dieting (32). However, thin-idealization in women, and muscular/athletic-idealization in men, could play an important role in the development of eating disorders (33) and behavioral and emotional reactions (24). In the current study, the MBSRQ overweight preoccupation subscale can be used to evaluate such reactions. Moreover, it seems that being more preoccupied with weight is almost prevalent among women (P -value = 0.05).

High scorers in the illness orientation subscale are notified of signs of physical illness and are prone to seek medical care (34). In Cash and Brown's study, women were more illness-oriented (35), which is consistent with the results of our study. While women mention more sicknesses, both chronic and acute than men, its severity is lower among

them, and all age groups had lower death rates (36, 37). It seems that seeking medical care leads to such results. Females are more likely to act in preventive health behaviors (38, 39). They place a higher cost on health than do men (39). The gender differences in health and illness orientations can be explained by gender role responsibilities. Therefore, women's responsibility of being in the family's health may contribute to more significant concern in health and health-related behaviors.

According to the findings, an increase in body weight, BMI, waist circumference, waist to hip ratio, visceral fat level, and visceral fat area can reduce appearance orientation among the studied population. A positive correlation was found among subjective weight, overweight preoccupation, health evaluation, anthropometric indicators, and body composition. In previous studies, the association among BMI (14, 40), waist circumference (15, 41), waist to hip ratio (15), visceral fat level, visceral fat area (2), and body image dissatisfaction has been established. These results suggest that anthropometric indicators and body composition components may be reliable indexes of body image dissatisfaction among the studied population. Also, these associations indicate the effect of fat distribution and abdominal obesity on subjective weight and overweight preoccupation. More attention needs to be paid to correcting body composition and body image for health promotion in the community.

The present study suffers from some limitations that must be mentioned, including the small sample size. Also,

we followed a cross-sectional design that is not appropriate to determine causality. Future research in this area would benefit from studying these issues longitudinally. In addition, self-administered questionnaires were used to access body image dissatisfaction, which is prone to bias. Also, this study was only focused on the correlation between gender differences and anthropometric indicators with body image dissatisfaction, while other factors such as socioeconomic, family, and media can affect it.

5.1. Conclusion

The results highlight the attention to body image subscales in Iranians, regardless of gender. Our observations may have implications for public health. The findings suggest that gender is the primary factor in determining body image. Thus, it demonstrates a different target group for which health interventions should be correctly designed.

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Footnotes

Authors' Contribution: Fatemeh Ghannadiasl had the study idea, collected and interpreted the data, and wrote the main body of the text. The author read and approved the final manuscript.

Conflict of Interests: The author declares that there is no competing interests.

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all consequences of possible withdrawal or future retraction will be with the corresponding author.

Ethical Approval: The present study was approved by the Ethics Committee of Ardabil University of Medical Sciences with code number IR.ARUMS.REC.1398.549.

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References

1. Zhang Y, Li T, Yao R, Han H, Wu L, Wu X, et al. Comparison of Body-Image Dissatisfaction Among Chinese Children and Adolescents at Different Pubertal Development Stages. *Psychol Res Behav Manag.* 2020;**13**:555–62. doi: [10.2147/PRBM.S242645](#). [PubMed: [32765130](#)]. [PubMed Central: [PMC7360414](#)].
2. Ghannadiasl F, Hoseini N. Association of visceral fat obesity with body image dissatisfaction among women. *Journal of Nutrition Fasting and Health.* 2020;**8**(3):199–204.
3. Stojcic I, Dong X, Ren X. Body Image and Sociocultural Predictors of Body Image Dissatisfaction in Croatian and Chinese Women. *Front Psychol.* 2020;**11**:731. doi: [10.3389/fpsyg.2020.00731](#). [PubMed: [32435214](#)]. [PubMed Central: [PMC7218091](#)].
4. Etu SF, Gray JJ. A preliminary investigation of the relationship between induced rumination and state body image dissatisfaction and anxiety. *Body Image.* 2010;**7**(1):82–5. doi: [10.1016/j.bodyim.2009.09.004](#). [PubMed: [19837639](#)].
5. Alharballeh S, Dodeen H. Prevalence of body image dissatisfaction among youth in the United Arab Emirates: gender, age, and body mass index differences. *Curr Psychol.* 2021;**1**:1–10. doi: [10.1007/s12144-021-01551-8](#). [PubMed: [33679115](#)]. [PubMed Central: [PMC7919234](#)].
6. Santos Silva DA, Nahas MV, de Sousa TF, Del Duca GF, Peres KG. Prevalence and associated factors with body image dissatisfaction among adults in southern Brazil: a population-based study. *Body Image.* 2011;**8**(4):427–31. doi: [10.1016/j.bodyim.2011.05.009](#). [PubMed: [21768003](#)].
7. Forrester-Knauss C, Zemp Stutz E. Gender differences in disordered eating and weight dissatisfaction in Swiss adults: which factors matter? *BMC Public Health.* 2012;**12**:809. doi: [10.1186/1471-2458-12-809](#). [PubMed: [22992241](#)]. [PubMed Central: [PMC3503783](#)].
8. Quittkat HL, Hartmann AS, Dusing R, Buhlmann U, Vocks S. Body Dissatisfaction, Importance of Appearance, and Body Appreciation in Men and Women Over the Lifespan. *Front Psychiatry.* 2019;**10**:864. doi: [10.3389/fpsyg.2019.00864](#). [PubMed: [31920737](#)]. [PubMed Central: [PMC6928134](#)].
9. Nazarpour S, Simbar M, Majd HA, Torkamani ZJ, Andarvar KD, Rahnamaei F. The relationship between postmenopausal women's body image and the severity of menopausal symptoms. *BMC Public Health.* 2021;**21**(1):1599. doi: [10.1186/s12889-021-11643-6](#). [PubMed: [34461857](#)]. [PubMed Central: [PMC8404323](#)].
10. Noh JW, Kwon YD, Yang Y, Cheon J, Kim J. Relationship between body image and weight status in east Asian countries: Comparison between South Korea and Taiwan. *BMC Public Health.* 2018;**18**(1):814. doi: [10.1186/s12889-018-5738-5](#). [PubMed: [29970058](#)]. [PubMed Central: [PMC6029392](#)].
11. Markey CH, Dunaev JL, August KJ. Body image experiences in the context of chronic pain: An examination of associations among perceptions of pain, body dissatisfaction, and positive body image. *Body Image.* 2020;**32**:103–10. doi: [10.1016/j.bodyim.2019.11.005](#). [PubMed: [31862524](#)].
12. Kruger J, Lee CD, Ainsworth BE, Macera CA. Body size satisfaction and physical activity levels among men and women. *Obesity (Silver Spring).* 2008;**16**(8):1976–9. doi: [10.1038/oby.2008.311](#). [PubMed: [18551115](#)].
13. Nikniaz Z, Mahdavi R, Amiri S, Ostadrahimi A, Nikniaz L. Factors associated with body image dissatisfaction and distortion among Iranian women. *Eat Behav.* 2016;**22**:5–9. doi: [10.1016/j.eatbeh.2016.03.018](#). [PubMed: [27046301](#)].
14. Chen G, He J, Zhang B, Fan X. Body weight and body dissatisfaction among Chinese adolescents: Mediating and moderating roles of weight-related teasing. *Curr Psychol.* 2019;**11**:1–9. doi: [10.1007/s12144-019-00572-8](#).

15. Pelegrini A, Sacomori C, Santos MC, Sperandio FF, Cardoso FL. Body image perception in women: Prevalence and association with anthropometric indicators. *Rev Bras de Cineantropometria e Desempenho Hum.* 2013;**16**(1):58–65. doi: [10.5007/1980-0037.2014v16n1p58](#).
16. Weinberger NA, Luck-Sikorski C. Body appreciation and appearance evaluation in individuals with obesity compared to individuals with normal-weight: Findings from a representative German population sample. *Eat Weight Disord.* 2021;**26**(7):2241–9. doi: [10.1007/s40519-020-01071-7](#). [PubMed: [33278021](#)]. [PubMed Central: [PMC8437869](#)].
17. Rahati A. [Evolutionary study of body image and its relationship with self-esteem based on comparison between adolescent, middle age and old people [dissertation]]. Tehran, Iran: Shahed University; 2004. Persian.
18. World Medical A. World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA.* 2013;**310**(20):2191–4. doi: [10.1001/jama.2013.281053](#). [PubMed: [24141714](#)].
19. Weinberger NA, Kersting A, Riedel-Heller SG, Luck-Sikorski C. Body Dissatisfaction in Individuals with Obesity Compared to Normal-Weight Individuals: A Systematic Review and Meta-Analysis. *Obes Facts.* 2016;**9**(6):424–41. doi: [10.1159/000454837](#). [PubMed: [28013298](#)]. [PubMed Central: [PMC5644896](#)].
20. Moehlecke M, Blume CA, Cureau FV, Kieling C, Schaan BD. Self-perceived body image, dissatisfaction with body weight and nutritional status of Brazilian adolescents: A nationwide study. *J Pediatr (Rio J).* 2020;**96**(1):76–83. doi: [10.1016/j.jpeds.2018.07.006](#). [PubMed: [30098939](#)].
21. Stice E, Marti CN, Durant S. Risk factors for onset of eating disorders: Evidence of multiple risk pathways from an 8-year prospective study. *Behav Res Ther.* 2011;**49**(10):622–7. doi: [10.1016/j.brat.2011.06.009](#). [PubMed: [21764035](#)]. [PubMed Central: [PMC4007152](#)].
22. Mond J, Mitchison D, Latner J, Hay P, Owen C, Rodgers B. Quality of life impairment associated with body dissatisfaction in a general population sample of women. *BMC Public Health.* 2013;**13**:920. doi: [10.1186/1471-2458-13-920](#). [PubMed: [24088248](#)]. [PubMed Central: [PMC3850528](#)].
23. Fallon EA, Harris BS, Johnson P. Prevalence of body dissatisfaction among a United States adult sample. *Eat Behav.* 2014;**15**(1):151–8. doi: [10.1016/j.eatbeh.2013.11.007](#). [PubMed: [24411768](#)].
24. Argyrides M, Kkeli N, Koutsantoni M. The comparison of cyprus to six other european countries on body image satisfaction, appearance investment and weight and appearance-related anxiety. *The European Journal of Counselling Psychology.* 2020;**8**(1):32–42. doi: [10.5964/ej-cop.v8i1.182](#).
25. Öberg P, Tornstam L. Body images among men and women of different ages. *Ageing Soc.* 1999;**19**(5):629–44. doi: [10.1017/S0144686X99007394](#).
26. Smith DE, Thompson JK, Raczyński JM, Hilner JE. Body image among men and women in a biracial cohort: The CARDIA Study. *Int J Eat Disord.* 1999;**25**(1):71–82. doi: [10.1002/\(sici\)1098-108X\(199901\)25:1<71::aid-eat9>3.0.co;2-3](#). [PubMed: [9924655](#)].
27. McCabe MP, Ricciardelli LA. Body image dissatisfaction among males across the lifespan. *J Psychosom Res.* 2004;**56**(6):675–85. doi: [10.1016/S0022-3999\(03\)00129-6](#).
28. Pliner P, Chaiken S, Flett GL. Gender Differences in Concern with Body Weight and Physical Appearance Over the Life Span. *Pers Soc Psychol Bull.* 2016;**16**(2):263–73. doi: [10.1177/0146167290162007](#).
29. Tiggemann M, Lynch JE. Body image across the life span in adult women: The role of self-objectification. *Dev Psychol.* 2001;**37**(2):243–53. doi: [10.1037/0012-1649.37.2.243](#). [PubMed: [11269392](#)].
30. Neumark-Sztainer D, Wall MM, Chen C, Larson NI, Christoph MJ, Sherwood NE. Eating, Activity, and Weight-related Problems From Adolescence to Adulthood. *Am J Prev Med.* 2018;**55**(2):133–41. doi: [10.1016/j.amepre.2018.04.032](#). [PubMed: [29937114](#)]. [PubMed Central: [PMC6072273](#)].
31. Baceviciene M, Jankauskiene R, Balciuniene V. The Role of Body Image, Disordered Eating and Lifestyle on the Quality of Life in Lithuanian University Students. *Int J Environ Res Public Health.* 2020;**17**(5). doi: [10.3390/ijerph17051593](#). [PubMed: [32121625](#)]. [PubMed Central: [PMC7084262](#)].
32. Eik-Nes TT, Austin SB, Blashill AJ, Murray SB, Calzo JP. Prospective health associations of drive for muscularity in young adult males. *Int J Eat Disord.* 2018;**51**(10):1185–93. doi: [10.1002/eat.22943](#). [PubMed: [30260492](#)].
33. Williams BM, Levinson CA. Negative beliefs about the self prospectively predict eating disorder severity among undergraduate women. *Eat Behav.* 2020;**37**:101384. doi: [10.1016/j.eatbeh.2020.101384](#). [PubMed: [33230928](#)]. [PubMed Central: [PMC7246166](#)].
34. Cash TF. *The Multidimensional Body-Self Relations Questionnaire users' manual*. Florida, USA: Body Images Research Consulting; 2000.
35. Cash TF, Brown TA. Gender and body images: Stereotypes and realities. *Sex Roles.* 1989;**21**(5-6):361–73. doi: [10.1007/bf00289597](#).
36. Lagro-Janssen T, Grosicar J. Morbidity figures from general practice: sex differences in traumatology. *J Eval Clin Pract.* 2010;**16**(4):673–7. doi: [10.1111/j.1365-2753.2009.01172.x](#). [PubMed: [20545810](#)].
37. Zhang H, Bago d'Uva T, van Doorslaer E. The gender health gap in China: A decomposition analysis. *Econ Hum Biol.* 2015;**18**:13–26. doi: [10.1016/j.ehb.2015.03.001](#). [PubMed: [25867249](#)].
38. Lawler SP, Winkler EA, Goode AD, Fjeldsoe BS, Reeves MM, Eakin EG. Moderators of health behavior initiation and maintenance in a randomized telephone counseling trial. *Prev Med.* 2014;**61**:34–41. doi: [10.1016/j.ypmed.2014.01.002](#). [PubMed: [24412896](#)].
39. Kim HJ, Choi-Kwon S, Kim H, Park YH, Koh CK. Health-promoting lifestyle behaviors and psychological status among Arabs and Koreans in the United Arab Emirates. *Res Nurs Health.* 2015;**38**(2):133–41. doi: [10.1002/nur.21644](#). [PubMed: [25620727](#)].
40. Pop CL. Association between Body Mass Index and Self Body Image Perception. *Iran J Public Health.* 2017;**46**(12):1744–5. [PubMed: [29259953](#)]. [PubMed Central: [PMC5734978](#)].
41. Pelegrini A, Coqueiro Rda S, Beck CC, Ghedin KD, Lopes Ada S, Petroski EL. Dissatisfaction with body image among adolescent students: association with socio-demographic factors and nutritional status. *Cien Saude Colet.* 2014;**19**(4):1201–8. doi: [10.1590/1413-81232014194.09092012](#). [PubMed: [24820603](#)].