

Body Image, Perceived Physical Fitness, Physical Activity, Body Mass Index and Age in Women

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Abstract

Background: Body image is an important factor in women's lives.

Objectives: The purpose of the current study was to explore the association among body image, perceived physical fitness and its subscales, physical activity, body mass index and age in women.

Patients and Methods: This cross-sectional study was carried out on a sample of 82 women from University of Tabriz staff and masters. Participants were selected through convenience sampling. Individual characteristics, physical activity rate, body image and perceived physical fitness questionnaires were completed. Data were analyzed by Kolmogorov-Smirnov, Pearson's correlation coefficient and regression.

Results: The results of the study indicated a significant linear association of body image with body mass index ($r = 0.769$, $P = 0.0001$), body composition ($r = 0.587$, $P = 0.0001$), and aerobic endurance ($r = -0.229$, $P = 0.038$). In addition, there was no significant linear relationship between physical activity and other variables, except for flexibility ($r = 0.258$, $P = 0.019$) and age ($r = 0.418$, $P = 0.0001$). Regression analysis showed that physical self-perception, aerobic endurance, body composition, muscular strength, flexibility, and body mass index could predict 64% of the variance of body image.

Conclusions: Physical self-perception and its factors along with body mass index are important to build up body image. Some interpretations and limitations about physical activity motives and measurements were also cited.

Keywords: Body Image, Self-Concept, Motor Activity, Body Mass Index, Women

1. Background

Body image is related to an individual's perceptions, feelings and thoughts about one's body and incorporates body size estimation, evaluation of body attractiveness, and emotions associated with body shape and size (1). During past years, participation in physical activity (PA) has been known as one of the best methods to get the ideal body image. It has been suggested that some types of PAs and exercises may be beneficial in enhancing body image and there is a significant relationship between PA and body image variables (2).

World Health Organization (WHO) has recommended that adults aged 18 - 64 years should do at least 150 minutes of moderate-intensive PA or at least 75 minutes of vigorous-intensive PA throughout the week, or an equivalent combination of moderate and vigorous-intensive activities (3). On the other hand, some researches showed no significant effect of PA and exercise on body image as well as no relationship between them (4). Rote cited that unlike structured exercise, lifestyle PA was irrelevant to women's body image. Other studies demonstrated that enhanced physical exercise was related to a negative body image, elevated

body focus, weight preoccupation, and drive for thinness (5-7).

The evaluation of one's size, weight, strength, flexibility, endurance or other aspects of body that determine the manner in which the body is viewed (known as perceived physical fitness), are the essential components of the physical aspect of body image. Hausenblas and Fallon showed that exercisers had a more positive body image than non-exercisers and exercise intervention promoted body image (8). Abbott and Barber indicated that involvement in sport activities was associated with more functional body image (9). Fox found that 78% of the reviewed studies demonstrated that physical self-perceptions improved following exercise (10).

Exercise also improves the positive ways that women experience their bodies. Women who had a positive body image often mentioned regular exercise as a way to promote care for their bodies and overall well-being (11). These women viewed exercise as a way to relieve stress, enjoy themselves, and improve their health rather than a way to lose weight. Furthermore, female athletes described feeling proud of their strong and developed bodies (12). Many

of the feelings and attitudes described by these athletes are similar to the characteristics of positive body image, suggesting a connection between PA and positive body image (13). Sonstroem et al. in their own model showed that exercise in adult female aerobic dancers was associated with positive evaluations of their physical conditions (14).

Some other studies have shown relationships between body mass index (BMI), body image and PA. Altintas et al. indicated that BMI was the only predictor of perceived body attractiveness and body image for females (2). Negative association has been shown between body image and BMI (15, 16). Duncan indicated that BMI decreased significantly after six weeks of circuit training (17).

It seems that women at midlife and beyond have a variety of experiences that affect their body images, such as low importance of physical appearance, biological body changes, cultural factors i.e. fear of aging, and potential loss of attractiveness (18). In addition, women experience high levels of body shame, regardless of age (19). It was shown that BMI was correlated with negative body image (20) and Kaufer-Horwitz et al. revealed that the correlation coefficient between silhouette ratings (body image) and BMI was 0.766 in females (21).

2. Objectives

Based on previous researches, we investigated the relationships between body image, perceived physical fitness and its subscales, rate of PA, and BMI. To perform this, we analyzed the prediction power of body image based on perceived physical fitness subscales, BMI and PA in mature females.

3. Patients and Methods

This was a cross-sectional study. Participants were 82 females aged 20 - 60 years who were selected through convenience sampling between staff and masters of University of Tabriz. They were asked to complete some demographic factors such as age, educational background, health and marital status, number of children, weight, height and BMI (according to the following formula: $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m}^2\text{)}$). Each participant completed an informed consent.

Due to limitations of PA questionnaires made in developed countries to use in developing countries based on socio-cultural differences (22), a researcher made a PA questionnaire which was already confirmed for content and face validity and reliability of internal consistency by the authors of the current research and other experts in this field. This questionnaire is used to assess PA in terms

of frequency, intensity, duration and type of PA per week. In the current study, the Cronbach's alpha was 0.69.

Body image was measured using Stunkard et al. figure rating scale (23). The scale comprises a set of nine figure, depicting individuals in the range of body size from very thin = 1 to very heavy = 9. Respondents were asked to indicate which figure they believed looked like their bodies the most. Some studies have shown that the scale has been a valid and reliable measure of body image (24, 25). In this study, convergent construct validity based on the relationship between body image and BMI was 0.707 ($P < 0.01$).

Self-reported physical fitness was assessed using the perceived physical fitness scale (PPFS) developed by Abadie. The scale consists of 12 statements related to fitness in four subscales including aerobic endurance (AE), flexibility (Flex), muscular strength (MS), and body composition (BC). Participants were asked to select one of five possible answers (strongly disagree, disagree, undecided, agree, or strongly agree) to reflect how they felt about each statement to the best of their knowledge. The range of possible scores was from 12 (suggesting that the perception of one's fitness was low) to 60 (suggesting that the perception of one's fitness was high) (26). The convergent validity of this scale was judged to be good and test-retest reliability was high ($r = 0.97$). In addition, concurrent validity based on the correlation between subscales and performance measures was moderate to strong in younger adults (27). In this study, construct validity by means of correlation coefficient between PPF and its subscales including aerobic endurance ($r = 0.453$, $P = 0.0001$), flexibility ($r = 0.480$, $P = 0.480$), strength ($r = 0.431$, $P = 0.0001$), and body composition ($r = 0.142$, $P = 0.021$) were obtained.

Data were analyzed by means of Kolmogorov-Smirnov test, Pearson's correlation coefficient, and regression analysis. All the analyses were carried out using SPSS version 20 and $P < 0.05$ was considered statistically significant (IBM Corp., Armonk, NY, USA).

4. Results

The majority of females were healthy, without chronic illnesses: $n = 72$, 87.8%; under bachelor's degree: $n = 19$, 23.2%, bachelor's degree: $n = 39$, 47.6%, master's degree and doctorate: $n = 24$, 29.3%; married: $n = 54$, 65.9%; had no children: $n = 45$, 54.9%, one child: 24.4% and two children: $n = 20$, 20.7%; $n = 81$, 98.8% of them did not smoke. Based on the PA questionnaire, 32 (39%) persons were active and others were less active.

Mean $\pm$ SD and data normality parameters of all the variables are shown in Table 1. As seen, data normality criteria were adhered (Table 1).

Table 1. Descriptive Statistics and Normality Tests of Variables

	Age	PA	BMI	BI	AE	Flex	MS	BC	PPFS
Mean	35.24	9.86	26.36	5.08	13.75	6.14	6.14	6.37	32.58
SD	6.53	3.79	3.96	2.05	2.18	1.79	1.56	2.04	4.84
Skewness	0.471	-0.060	0.586	0.076	0.095	0.062	-0.507	-0.104	-0.141
Kurtosis	-0.347	-1.180	0.630	-0.895	-0.471	-0.439	-0.051	-0.771	0.763
Kolmogorov-Smirnov Z	1.129	1.240	.938	1.251	1.335	1.287	1.319	.995	1.032
P Value	0.156	0.092	0.343	0.087	0.057	0.073	0.062	0.276	0.237

Correlations matrix indicated that body image was positively associated with BMI and body composition, and negatively with aerobic endurance. Interestingly, PA was simply related to flexibility and age positively (Table 2).

A weighted combination of the predictor variables explained approximately 64% of the variance of body image (adjusted $R^2 = 0.643$).

With the exception of PA and age, all other predictors were statistically significant. As seen by examining the beta weights, PPFS, aerobic endurance, body composition, muscular strength, flexibility and BMI made relatively larger contributions to the prediction model, respectively (Table 3).

5. Discussion

This study intended to examine the relative contribution of BMI, physical self-perception and its subscales, PA and age to body image of mature women.

It was indicated that body image was related to BMI and body composition positively and to aerobic endurance negatively. PA was simply related to flexibility and age positively. Physical self-perception was related to its own subscales and BMI positively. In addition, BMI was related to physical self-perception, body composition and age positively and to aerobic endurance negatively. These findings were consistent with previous researches that indicated a relationship between body image and BMI (15, 16, 20, 21, 28, 29). In this case, the positive/negative relationship between body image and BMI depended on body image measurements. This research showed that increased BMI and body composition were associated with increased body image and decreased aerobic endurance. In addition, aerobic endurance training is usually used for weight loss and persons with high aerobic endurance have less body fat and BMI which helps them in prolonged training sessions; therefore, these results are justified.

Interestingly, PA was only related to flexibility and age. These results are inconsistent with other researches which showed significant linear relationship/effect of PA on body image and BMI (2, 13, 17, 30). However, our research results

are consistent with the results of Rote et al. He showed that lifestyle PA was unrelated to women's body image (4). It seems that the motives of PA participation and quality of PA experiences (as indexed by PA enjoyment) may influence future achievements (31). Homan and Tylka cited that messages promoting exercise need to deemphasize weight loss and appearance for positive body image (13). In the main purpose of this research, we showed that body image was predicted by PPFS, aerobic endurance, body composition, muscular strength, flexibility, and BMI which is consistent with other researches (9, 10). On the other hand, PA could not predict body image. These results suggest that it is not PA involvement that leads to women feeling more positive about their bodies. On the contrary, PA provides the opportunity for them to refine their physical skills, develop strength and muscle tone, improve coordination, and develop some other psychological characteristics (32). Consistent with masculinity and self-concept theory, females who feel more physically competent will also be more satisfied with their bodies. These findings demonstrated the importance of physical self-perception competences as potential mechanisms, through which body image can be developed.

The findings of this study were subject to a number of limitations. Although in this research we did not measure motives of PA, based on our participants' characteristics (i.e. feminineness and high mean of BMI), we anticipated their participation in PA due to weight loss, concerns about physical appearance, and drive for thinness. If PA participation was less enjoyable, all of these motives would lead to deteriorate body image and other self-perceptions (31).

In addition, types of PA, exercise, and sports can have different effects on body image and related variables (16). Furthermore, it is important to note that body image has three critical components including physical appearance, physical ability, and biological integrity (4). It seems that the inconsistency in the results of different researches were due to addressing different aspects. Hence, future researches are needed to consider different aspects of body image, PA, and types of exercises among different ages and genders.

Table 2. Correlation Coefficients Among Variables^a

	BMI	AE	Flex	MS	BC	PPFS	PA	Age
BI	0.769**	-0.229*	0.001	-0.150	0.587**	0.067	-0.002	0.188
BMI		-0.231*	0.183	-0.056	0.739**	0.240*	-0.019	0.248*
AE			0.493**	0.292**	-0.161	0.668**	-0.020	0.026
Flex				0.554**	0.250*	0.862**	0.258*	0.099
MS					-0.021	0.651**	-0.001	-0.192
BC						0.413**	-0.090	0.080
PPFS							0.043	0.006
PA								0.418**

^a**, P < 0.01; *, P < 0.05.**Table 3.** Result Details of Independent Variables in Model

Model	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig. ^a
	B	Standard Error			
BMI	0.402	0.055	0.779	7.361	0.001*
BC	1.488	0.404	1.486	3.688	0.001*
AE	1.568	0.429	1.672	3.657	0.001*
PPFS	-1.440	0.405	-3.406	-3.560	0.001*
MS	1.449	0.428	1.105	3.388	0.001*
Flex	1.099	0.396	0.964	2.772	0.007*
PA	0.060	0.044	0.112	1.376	0.173
Age	-0.023	0.025	-0.075	-0.927	0.357

^a*, Statistically Significant.

In this research, all the variables were assessed subjectively. Especially, since self-reported measures of PA assess individuals' perceptions of their PAs and perceptions do not always align with reality (33), this method might have affected our results. In addition, in this research, we had 10 people with chronic illnesses and these illnesses might have affected their body images. It is recommended to consider these issues in future researches.

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Footnotes

Authors' Contribution: Study design, Seyed Hojjat Zamani Sani, Zahra Fathirezaie; data collection and analysis, Seyed Hojjat Zamani Sani, Mahta Eskandarnejad, Zahra

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