Original Article

A model investigation of social, cognitive and emotional precedents of eating disorders among female students

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ABSTRACT

Introduction: The purpose of this study was designing and testing a model of antecedents of eating disorders symptoms in undergraduate students of Esfahan University. Method: 497 undergraduate students of Esfahan University Method: 497 undergraduate students of Esfahan University (average age 20.51 and standard deviation 1.51) selected by using cluster sampling method and completed five scales of present study. To test the proposed model, the structural modeling analysis, with application of maximum likelihood approach was used. Also, to evaluate indirect effects in the model was used bootstrapping method. Results: Results showed that the fit indices for proposed model are in the acceptable+ range. Also, the results showed that antecedent variables had significant direct and indirect effects on the eating disorders symptoms. Conclusion: Generally, results of present study showed formation of eating disorders symptoms through media effects and cognitive and emotional variables in an Iranian sample. Also, these results was explained in a theoretical and experimental context and their theoretical and practical implications was presented.

Keywords: Internalization of media models, eating disorders symptoms, body fitness, structural equation modeling

Introduction

During the last decade, researchers, clinical technicians and the public have given increasing attention to eating disorders [1]. Eating disorders are psychological disorders characterized by excessive worry about one's body shape, eating and weight [2] and are divided into three categories of anorexia nervosa, bulimia nervosa and eating disorder not otherwise specified [3]. Anorexia nervosa is followed by symptoms such as intentional excessive food restriction, strong desire to be thin and chronic fear of gaining weight and the presence of symptoms caused by hunger and fasting, and bulimia nervosa include symptoms such as improper ways for preventing weight gain, frequent binge eating episodes, behaviors to prevent weight gain after binge eating and chronic fear of getting fat.

In etiology of eating disorders, various biological, psychoanalytical, psychological and social factors have been mentioned. One of the social factors is the media. The most effective factor in developing and enforcing physical beauty is the mass media activities. Media presentation with a lot of ideal images is a significant source of social-cultural pressure. Our research shows that internalization of media models about appearance is significantly associated with the fear of physical deformity and the constructs related to it [4]. Our study also shows that watching fashion magazines and pictures is correlated with appearance dissatisfaction and obsessions [5, 6]. In a correlational study by Kim and Lennon (2007) the relationship of media consumption with body image, self-esteem and tendencies of eating disorder was reviewed in a sample of university students. The results of this study showed that media consumption, especially beauty and fashion journals, is closely related to general dissatisfaction of appearance. Moreover, eating-related problems are also positively correlated with general dissatisfaction of appearance, body and low self-esteem.

Also, exposure to media and internalization of their ideal body would affect people perceptions of beauty and its importance [7]. Maladaptive beliefs that are influenced by socio-cultural factors [8] especially the media [9], have been considered as a risk factor and important cause of body image worry. In cognitive-behavioral patterns of eating disorders [10] the roles of attitudes and beliefs about weight, shape and eating in developing eating disorders and their symptoms are both emphasized. These beliefs are usually reflected in automatic thoughts about weight, body shape and eating. Studies conducted by Cooper, Cohen-

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Tovee, Todd, Wells, & Tovee (1997) and Rose, Cooper, & Turner (2006) confirm the significance of these beliefs in developing eating disorders [11, 12]. Anyway, negative automatic thoughts and inadequate beliefs regarding shape and weight may provide good cognitive explanations for eating disorders [12]. Results show that beliefs related to eating disorders can provide the context for the development of eating disorders [13]. Piekarewicz (2013), showed that the internalization of ideals suggested by the mass media regarding the way one presents him/herself has a negative and meaningful effect on body image satisfaction [14]. The results also showed that these variables lead to an increase in problematic views and behaviors related to eating.

According to our study, eating attitudes is positively related to body image dissatisfaction and negatively related to ideal body image but anorexia nervosa and bulimia nervosa are positively related to problems with body image [15]. Maladaptive beliefs of the individual about physical attractiveness can lead to a distorted image of them and end in dissatisfaction from this image. Body image is a psychological experience of physical body that involves the thoughts, beliefs, feelings and estimated behaviors related to an individual's physical experience [16]. The difference between real body i8mage perception and the ideal bod would lead to dissatisfaction from the body and thus reduces one's physical and mental wellbeing for instance one's self esteem resides and eating disorders, compensatory behaviors such as extreme calorie restriction, excessive exercising and use of laxatives and steroids, plastic surgery and strong makeups follow to change that body image. [17]. People with eating disorder have extraordinary judgments regarding body shape, weight and obesity [18] and this would be followed by negative self-assessment and low self-esteem [19]. People with eating disorders have a low self-esteem [20]. People with low self-esteem show a higher risk taking for the symptoms of eating disorders [21].

Considering the above issues, a pattern of the precedents of eating disorders symptoms has been suggested in the present study. In this study the effect of mental precedents and the social factor that is internalization of media models on eating disorders symptoms will be examined. Therefore, the aim of this study is to evaluate and examine this conceptual model using experimental data. Figure 1 shows the conceptual model of the study.

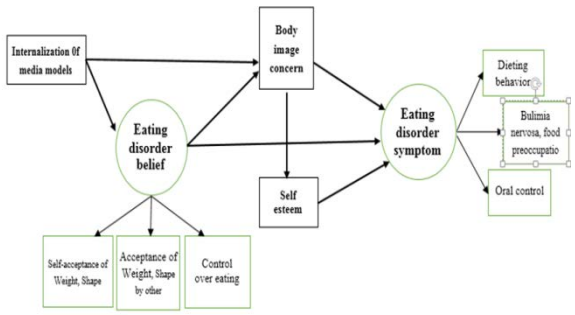

Figure 1: Conceptual model

Methods

Research design:

This study has a correlational design that tries to investigate the relationships between the variables simultaneously in the form of a model using structural equation modeling (SEM).

Statistical population, sample and sampling method:

The population of this study included all the female undergraduate students of Isfahan University in the academic year 2016-2017. A total of 497 female students (average age 20.51 and standard deviation 1.51) were selected by cluster sampling method and answered our questionnaires. In the sampling process first, 5 faculties of technical – engineering, basic science, computer engineering, economics and humanities were selected randomly out of 13 faculties of Isfahan University and in the next step 3 classes were selected randomly from each faculty and then the questionnaires were handed out to the students.

Measures

Body Image Concern Inventory/BICI. This inventory is a 19-item tool developed by Littleton, Axsom & Pury (2005) in order to assess dysmorphic appearance concern [22]. Respondents to this 19-item inventory rate their own success by a 5-point Likert scale. The results of Littleton et al (2005) and Littleton & Breitkopf (2008) studies from a two-factor structure including dysmorphic symptoms (the first 14 items) and deficiencies in social performance (the last 5 items) support this inventory [22, 23]. The results also show that this inventory has a good reliability (chronbach alpha 0.76 – 0.92) and convergent validity and predictor [22]. In Iran, Basak nejad and Qafari (2007) have examined the psychometric properties of this inventory in an Iranian case [24]; they obtained a reliability of 0.95 with using chronbach alpha and its validity was confirmed by calculating the correlation fear of negative evaluation scale and fear of negative evaluation about the body. In this study, only the subscales of dysmorphic symptoms were used.

socio-cultural attitudes toward appearance questionnaire-third edition/ SATAQ-3: this is one of the most used tools for evaluating patterns internalization and socio-cultural beliefs pressures about appearance which has been developed by Thompson, , van den Berg, Roehrig, Guarda, & Heinberg and has 30 items. In Thompson et al. (2004) study, the results of exploratory factor analysis showed 4 agents: overall internalization with ceronbach alpha of 0.96, athletic internalization with cronbach alpha of 0.92, informative with cronbach alpha 0.95, pressures with cronbach alpha of 0.96 [25]. Also, the results of this study suggested a good convergent validity of this scale with the scales of body image and eating disorders. In Iran, Ardakan, Kheir addin and Yusefi (1393) have examined the validity of this scale using explorative factor analysis, and obtained reliability by chronbach alpha coefficient. The results of this study suggested that the data

show the four-factor structure and cronbach's alpha for the whole scale is 0.77. In this study, overall internalization subscale has been used; this subscale assesses media effects such as Television, Journals and movies in the form of the internalization of the patterns presented in these media.

Rosenberg Self Esteem Scale: this scale has been developed by Rosenberg (1965) and include 10 self-report items that describes the general feeling of self-values or acceptance in a positive way and the subject answer it based on a four-point likert scale (total disagreement to total agreement). Rasitkas, Hably and Zambo (2004) have calculated cronbach alpha coefficient for American 0.87T Canadian 0.86 and Newzland 0.83 students [26]. Mohammadi (2005) reported cronbach alpha coefficient and splitting of this scale to be 0.73 for one-week interval and 0.78 for three weeks interval which suggests that all the re-test coefficients obtained are meaningful [27].

Eating Disorder Belief Questionnaire (EDBQ): this questionnaire was designed in 1997 by Cooper, Cohen-Tovee, Todd, Wells and Tovee to serve as a self-evaluating tool for assessing beliefs and ideas related to eating disorders. The English version of this tool include 32 questions and 4 subscales: negative self-beliefs, weight and shape as a means to acceptance by others, weight and shape as a means to self-acceptance and controlling binge eating. The explorative factor analysis of the questions with varimax rotation also showed the same 4 main factors and negative self-beliefs is a sub-scale that measures core beliefs related to depression and 3 other subscales related to core beliefs of eating disorders. Cronbach alpha coefficients for negative self-belief, weight and shape accepted by others, weight and shape accepted by one's self and controlling binge eating have been respectively reported to be 0.94, 0.95, 0.90 and 0.89 [12]. Psychometric properties of this questionnaire have been examined in IRAN BY Shayeghian and Vafaie (2009). Factor analysis results like factor analysis in the main sample showed four factors. The validity of the questionnaire was also calculated to be 0.89 by cronbach alpha.

Eating attitudes test (EAT): in order to measure eating disorder symptoms and eating quantity, a test introduced by Garner, Olmsted, Bohr & Garfikel (1982) has been used which includes 26 questions, and 3 subscales of diet, binging and obsession with food and mental control [28]. Answering measure is a 6 point likert scale (from never to always). This test has been widely used as a self-evaluating tool for attitudes and behaviors related to eating disorders. The reliability of this test for clinical and non-clinical group based on cronbach alpha was 0.94 and all the 26 questions correlate significantly with the test total score (r=0.44). [28]. This questionnaire has been applied in Iran by Nobakht and Dejkam (2000) who reported a re-test reliability of 0.91 for it [29].

Data Analysis Method:

Structural equation modeling has been applied for the research conceptual model test using maximum likelihood estimate. K square indexes (K2), K square on degree of freedom (K2/df), goodness of fit index (GFI), normed fit index (NFI), Tucker-Lewis index (TLI), comparative fit index (CFI), root mean square error of approximation (RMSEA) and standardized root mean residual (SRMR) have been used in order to examine the study model fit with experimental data. Finally, bootstrapping was used to examine the significance of the indirect effects in the model. The 19th version of AMOS software has been used for the structural equation modeling analyses.

Results

Table 1 indicates descriptive statistics of the present model variables, including the mean and standard deviation, and also bivariate correlation matrix between these variables.

Table 1: Descriptive Statistics of Model Variables

MODEL VARIABLES	1	2	3	4	5
1.Internalization of media models	1				
2. Eating disorder belief	.33**	1			
3. Body image concern	.55**	.45**	1		
4. Self esteem	.24**	-.47**	.49**	1	
5. Eating disorder symptoms	.32**	.41**	.26**	.22**	1
Mean	18.57	34.98	30.67	36.91	53.12
standard deviation	7.82	10.83	8.61	7.47	14.20

(**P< .01, *P< .05)

The results in Table 1 show that the model variables are meaningfully correlated. Moreover, all the variables, except self-esteem are directly related to each other.

The present model include five variables among which four variables of media models internalization, latent variables related to eating beliefs, body image concern and self-esteem have been considered as precedent variables and latent variable of eating disorder has been considered as dependent variable. This model has been analyzed using maximum likelihood estimate correction and fit indices were extracted. Table 2 shows fit indices for the recommended pattern of the study.

Table 2: Fit indices for the Proposed Model

Proposed model	SRMR	RMSEA	CFI	TLI	NFI	GFI	χ^2/df	Df	χ^2
	.044	.069	.96	.93	.94	.97	3.33	22	75.36

According to Table 2, K2 index on degree of freedom is less than 5, RMSEA and SRMR indices are less than 0.08 and the indices of GFI, NFI, TLI and CFI are more than 0.9. The results suggest that all the fit indices of the present model are in an optimum range (for reviewing acceptable values for fit indices see Hu and Bentler, 1999) and thus this model fits with the experimental data obtained from the sample group.

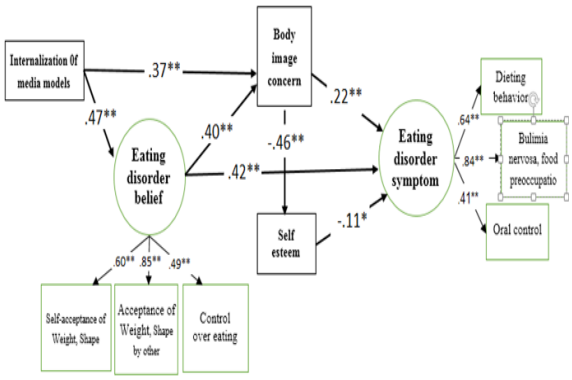

Figure 2: Estimated parameters in research model (**P < 0.01, *P < 0.05)

Figure 2 shows estimated parameters of research model using maximum correction method, including standardized path coefficients, significance of this coefficients and indicators factor loads on latent variables.

Results indicated in figure 2 shows that all the path coefficients (direct effects) and all the indicators factor loads on the model latent variables are significant at the alpha level of 0.05. These results suggest that the research structural model has an optimum fit too. Finally, 1000 bootstrap resampling method was used to examine the value and significance of the model indirect effects. The results of this analysis are available in Table 3.

Table 3: Value and significance of model indirect effects

significance	Lower line	Upper line	Standard value	Indirect effects
0/003	0/237	0/369	0/307	Media model internalization on eating disorder symptoms through eating related beliefs and body image concern
0/023	0/018	0/124	0/108	Beliefs related to eating on eating disorder symptoms through body image concern
0/036	0/009	0/087	0/051	Body image concern on eating disorder symptom through self-esteem

The results of Table 3 show that the upper and lower line of all he indirect effects of the model are positive and all the effects are meaningful at alpha level of 0.05.

Discussion

The present study was conducted with the aim of designing and examining a pattern of eating disorders symptoms precedents in a normal society. The underlying idea for developing this conceptual pattern was to understand how the modern mass media affect the psychological aspects related to eating disorders and the consequences of such aspects such as food abstain, binge eating, tendency for drugs and especial exercises for body fitness which are often seen in modern societies including Iran. Although the relationships in the pattern of this study have been used in previous studies, however no study have so far examined all these relationships in a single pattern and they have not been sed in an Iranian sample to explain these emerging damages.

Results indicated in figure 2 shows that all the path coefficients (direct effects) and all the indicators factor loads on the model latent variables are significant at the alpha level of 0.05.Also, the upper and lower line of all he indirect effects of the model are positive and all the effects are meaningful at alpha level of 0.05. One of the hypotheses of the current study concerned the positive effect of media model internalization on defective eating beliefs and the data of the study confirmed this hypothesis. These results are consistent with previous studies conducted on the positive effect of media internalization on defective beliefs about appearance and weight. Also, the Internalization of media models positively affected body image concern. Likewise, Results from former studies have indicated that media model internalization regarding appearance and body have a meaningful and significant relationship with the fear of body image and its related constructs [30]. Picaro and Wise (2013) also showed that internalization of mass media ideals about self-presentation can negatively and significantly affect body image satisfaction. Furthermore, results of the present study suggested that media patterns internalization has a positive and significant effect on body image concern both directly and through defective beliefs about eating. Media model internalization means that the individual has cognitively accepted ideal patterns of appearance presented by the media, so she changes her cognition, affects and behaviors to get close to these criteria. Following the internalization, the individual's beliefs about appearance and its significance change, e.g. by comparing herself with the patterns presented in the media, she believes in her unattractiveness, develops a distorted image of herself, her self-esteem declines and she evaluates her image negatively. Therefore, when people compare their appearance and body with ideal patterns generally presented through media, they start worrying about their body image [31]. Previous studies have also confirmed the positive and direct relationship of eating defective beliefs with body image concern [15].

Beliefs related to eating have also a positive direct effect on eating symptoms. This finding is also consistent with other studies which had shown that eating related beliefs provide the condition for the development of eating disorder symptoms [13]. Therefore eating related beliefs is both associated with the intermediation of body image concern and eating disorder symptoms.

Another finding of the current study is the direct and significant effect of body image concern on self-esteem and compensating behaviors such as dieting, oral control and binging. Previous studies have also shown that body image concern would lead to a low self-esteem [17]. Body image concern as the core of eating disorders has numerous consequences for the individual which is considered in the form of this disorder symptoms; as a result, people with body image concern are afraid of negative evaluation by others about their fitness. This happens because they believe that others would evaluate them as unattractive and reject them because of their weight [32]. One of the cognitive

and emotional reactions caused by body image concern is low self-esteem [17]. The results obtained from the pattern test of present study showed that self-esteem has a positive and meaningful effect on eating disorder symptoms. These results are consistent with the results of previous studies about the effect of self-esteem on eating disorders and fitness [6].

Finally, the most important behavioral reaction toward body image concern is the effort to lose weight. In the fifth edition of The Diagnostic and Statistical Manual of Mental Disorders [33] it is mentioned that one important consequence of body image concern is the effort to compensate for perceived defects; thus the individual tries in an organized excessive way to change her body and achieve her ideal image. This finding is also consistent with the results of the previous studies [17].

Generally, the results of the present study show how eating disorder symptoms develop through mass media effects, cognitive and emotional variables in an Iranian sample. These findings can be applied with the purpose of designing educational and therapeutic interventions to reduce media effects, defective beliefs and other cognitive and emotional features related to eating disorders so that we can reduce the maladaptive manifestations of eating disorder symptoms both in a normal society and also among the individuals suffering from this disorder. At the end, the most significant limitation of this study was the use of periodic data and the community being limited to students; therefore it is suggested that future studies investigate the research design in other statistical populations using longitudinal data.

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