Original Article

Disordered eating: The psychometric properties of the Persian version of the Eating Attitudes Test-8

Esmaeil Mousavi Asl[1], Sajjad Khanjani[2], Behzad Mahaki[3], Youkhabeh Mohammadian[4]

Abstract:

BACKGROUND: Disordered eating attitude may lead to full-blown eating disorders. Recent longitudinal studies show that disordered eating attitudes either remain stable or even increase from childhood to adulthood. The current study was done to determine the psychometric properties of the Eating Attitudes Test-8 (EAT-8) and introduce the suitable measure for researchers and therapist in the field of clinical psychology and psychiatrist.

MATERIALS AND METHODS: The Persian version of the EAT-8 was produced through forward translation, reconciliation, and back translation. A sample of 302 students were selected through convenience sampling method and completed a set of questionnaires, including the EAT-8, Eating Attitudes Test-16 (EAT-16), Eating Beliefs Questionnaire-18 (EBQ-18), self-esteem scale, and self-compassion scale short-form. The construct validity of the EAT-8 was assessed using confirmatory factor analysis and divergent and convergent validity. Internal consistency and test–retest reliability (2 weeks' interval) were conducted to evaluate the reliability. Data analysis was conducted using SPSS (version 22) software and LISREL (version 8.8).

RESULTS: EAT-8 was found to be valid and reliable measures, with good internal consistency and good test–retest reliability among students. In terms of convergent validity, EAT-8 showed a significant positive correlation with self-report measures of EAT-16 and EBQ-18. EAT-8 showed a negative correlation with self-compassion and self-esteem, thus demonstrated a good divergent validity. The results of this study also provide support for the one-factor model of the EAT-8.

CONCLUSION: The EAT-8 showed good validity and reliability and could be useful in assessing disordered eating in Iranian population. The EAT-8 shows notable promise as a measure for use in disordered eating research and clinical settings.

Keywords:

Eating, factor analysis, psychological tests, psychometrics, self-report

[1]Assistant Professor of Clinical Psychology, Department of Psychiatry, Golestan Hospital, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, [2]Department of Clinical Psychology, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, [3]Department of Biostatistics, School of Public Health, Kermanshah University of Medical Sciences, Kermanshah, [4]Department of Clinical Psychology, Kermanshah University of Medical Sciences, Kermanshah, Iran

Address for correspondence:
Dr. Youkhabeh Mohammadian, Department of Clinical Psychology, Kermanshah University of Medical Sciences, Kermanshah, Iran.
E-mail: yokhabe@gmail.com

Received: 03-03-2020
Accepted: 01-06-2020
Published: 26-11-2020

Introduction

Eating disorders are complicated and multifactorial diseases which are related to various parameters such as biological, growth, psychological, and sociocultural factors.[1] Eating disorders are considerably correlated with psychological and physical disorders[2] and are associated with increase in mortality[3] and suicide[4] and impose significant financial burden on the health system.[5] Mortality rate for these patients is higher than patients with other psychiatric diseases,[6] and it is estimated that it is responsible for 12 times greater rate for other causes in women aged 15–45 years.[7] Due to growing prevalence in all age, economic, social, and cultural groups, eating disorder is becoming as a concern.[8,9] The prevalence of disordered eating among university students has been reported to vary between 3.5% and 28.5%.[10,11] In another study, the prevalence rates of disordered eating attitudes among male, female, and total students were

5.3%, 4.0%, and 4.5%, respectively.[12] Problematic eating is common in general population, so that the prevalence of problematic eating in Germany ranges from 3.9[13] to 31.6[14] depending on screening tool and sample. The prevalence of disordered eating among Iranian students was 24.7%.[15] In another study, the prevalence of disordered eating among Iranian students was 10%.[16] Students are among those individuals with high risk of eating disorders and one-third of medicine students are affected.[1] Students are prone to high risk of eating disorders due to high educational stress, high burden of duties, need for continuous learning, and exposing to illness.[17-22] Undesirable attitude to eating and problematic eating are common among students.[23,24] Individuals with eating disorders do not often seek for medical support or just for later steps and after long-lasting duration of disease search for help.[25] On average, there is a 4-year delay between eating disorders and first treatment, and this delay can be as 10 years or more.[26] Therefore, early diagnosis and identification of individuals at risk of eating disorders to reduce current damages and shortening time between initiation and treatment of disorders can increase the rate of improvement.[22] Researchers always require accurate, reliable, and effective screening tools for eating disorders. This need is based on psychological and physical complications which are related to eating disorders.[23] Therefore, identification of individuals at high risk of eating disorders to provide timely treatment is necessary. Two short and useful screening tools for problematic eating are known internationally: the SCOFF Questionnaire[24] and the Weight Concerns Scale.[25]

Determination of score of Weight Concerns Scale is fully complicated and difficult due to various responses.[22] SCOFE has an acceptable sensitivity and specificity, but has low reliability and positive predicting value.[14,26] Eating Attitudes Test-26 (EAT-26) has acceptable psychometric properties for validity, reliability, sensitivity, and specificity, But it is long and complicated when used for public health Survey, and also increases the cost of public health Survey.[27] Self-report tools may allow the researcher to communicate with wider populations than those reached by clinical interviews. Brief and reliable scales could be useful for epidemiological studies conducted with several aims: (1) evaluating the prevalence of cases at risk for eating disorders; (2) assessing the prevalence of disordered eating attitudes and behaviors on large population; and (3) evaluating how much disordered eating attitudes and behaviors are prevalent among groups or subgroups.[28] Using EAT-8 is appropriate as a screening tool due to high prevalence of eating disorders.[22] Psychometric properties of EAT-8 are assessed and confirmed in one study.[22]

Given that public health management focuses on integrating treatment and prevention to reduce the incidence and prevalence of disease, First step in health management in a society is described as having an efficient and effective tool which can detect individuals at high risk of eating disorders.[29] In addition, a major part of studies are conducted on problematic eating and susceptibility of psychological studies in societies with individualized cultures, where understanding attitude on eating can be different from other societies and cultures. Assessment of psychometric properties of this scale in societies with various cultures can help external validity.[30] In the present study, we present a new questionnaire developed to provide an tool that is brief enough to be applied in epidemiological screenings and that assessing the frequency and the intensity of disordered eating attitudes and behaviors. In addition, due to prevalence and outcomes of eating disorders and lack of a valid and reliable scale to assess problematic eating in Persian language and its importance in clinical research and treatment, the current study aimed to investigate psychometric properties Persian version of EAT-8.

Materials and Methods

Sample

The design of this study was factor analysis. The study sample was all the students at degrees of Bachelor and Master of Science as well as PhD at Tehran University at 2019. To determine the sample size, there is a very important question in factorial analysis on determination of minimum required sample size to gather related data on modeling of structural equations. Recommended sample size for confirmative factorial analysis was estimated at 200 individuals.[31] Confirmative factorial analysis is more accurate, if the sample size is determined higher than 250.[32] Accordingly, the study sample consists of 340 students of Tehran University who were selected through convenience sampling method. Thirty-eight individuals were excluded due to incomplete fulfillment of questionnaire. This study was performed based on fulfillment of questionnaire, which was provided to participants after obtaining informed consent form. In addition, participants could abandon the study at any stage of the research. In addition, in order to increase the accuracy and motivation of the participants to cooperate and ensure the accuracy of the answers, they were told that if they want to know the results of the research, they can write their e-mail address in the questionnaire. To control the effect of arrangement and fatigue, questionnaires were provided according to different arrangements. Conducting this research had no financial cost for participants. This study was approved by Ethical Committee of Iran University of Medical Sciences (IR.IUMS.REC.1398.1138).

Instruments

Eating Attitudes Test-8

EAT-8 is the short form of EAT-26.[33] It is an 8-item self-report tool which assesses problematic eating and is scored through two-item format (approximately agree [1], and approximately disagree [0]). Reliability and validity of questionnaire were reported desirable. EAT-8 is a single factor and is an appropriate tool for screening eating disorders.[22]

The comparability between the Persian version of EAT-8 and the original EAT-8 has been validated by translation and back-translation procedures. The EAT-8 was first translated into Persian independently by four Ph. D. candidates in clinical psychology. Next, the Persian EAT-8 was back-translated by a bilingual individual, and the back-translated version was reviewed by other bilingual people. The final version of Persian EAT-8 was also compared to the original version by two bilingual clinical psychologists. In next step, the scale was tested on a sample of 20 individuals and its defects were corrected. After ending stages, final scale was prepared for performance on target population.

Self-compassion scale (short-form)

This scale includes 12 items which its responses are placed in a range of Likert of 5-degree from 1 (approximately never) to 5 (approximately always). Short-form version is highly associated with long-form version, and reliability of retest was reported as 0.92.[34] The Persian version of this scale has desirable psychometric properties.[35]

Eating Attitudes Test-16

EAT-16 is the short-form version of EAT-26.[33] This questionnaire is validated by Mac Laglin and includes simple sentences to assess attitudes and behaviors of eating. This scale has 16 items and is scored within a range of never to always. This scoring is for nonclinical population. Internal consistency and diagnosis accuracy are high and have desirable psychometric properties.[36] The Iranian version of it has desirable psychometric properties.[37]

The Eating Beliefs Questionnaire-18

This questionnaire has 18 items; respondents classified their consensus in a range from 1 (absolutely disagree) to 5 (absolutely agree). Eating Beliefs Questionnaire-18 (EBQ-18) can be used to assess the presence and severity of binge eating related to cognition in the clinical and nonclinical sample. Recently, one study used nonclinical sample, showing that EBQ-18 has appropriate psychometric properties such as internal consistency, divergent, and convergent validity.[38] The Iranian version of it has appropriate psychometric properties.[39]

Rosenberg self-esteem scale: A self-report scale is ten items that are scored from absolutely agree (score of 4) to absolutely disagree (score of 0). Scoring of this scale is performed directly and adversely. Score range is from 0 to 40. This scale has desirable psychometrics properties.[40,41]

Statistical analysis

Data analysis was conducted using the Statistical Package for the Social Sciences Statistics v. 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp, Chicago, USA, 2013). Test–retest reliability, internal consistency, convergent validity, and divergent validity of the Persian version of the EAT-8 were calculated. Internal consistency of the scale was calculated using Kuder–Richardson-20. Kuder–Richardson-20 within 70–95 represents a desirable internal consistency.[42] Test and retest reliability was calculated using intraclass correlations coefficient (ICC). An intraclass correlation (ICC) ≥ 0.70 shows acceptable test–retest reliability.[42] All the significant values for two ranges were reported, and level of 0.05 was considered for all the tests.

The construct validity of the EAT-8 was evaluated using structural equation modeling (SEM). The one-factor structures of the EAT-8, as suggested in the original version, were tested with LISREL software (version 8.8). The model parameters were estimated using maximum likelihood. The model was assessed based on some indices which are briefly explained here. The model's fit was examined using multiple indices, including the Chi-square statistic (χ^2), the comparative fit index (CFI), normed fit index (NFI), non-NFI (NNFI), root mean square error of approximation (RMSEA), and standardized root mean residual (SRMR). CFI, NFI, and NNFI values >0.90 were judged to indicate acceptable fit, as were RMSEA and SRMR values <0.08.[31,32] The normal Chi-square should be less than 3 for an acceptable model.[43] Incremental fit index (IFI) ≥ 0.95 indicative of good fitting models.[31] The goodness of fit index (GFI) and adjusted goodness of fit index (AGFI), which adjust for the number of parameters, were estimated, ranging from 0 to 1 with the values of 0.90 or greater indicating a good fitting model.[44]

Results

Description of the sample

The present research was conducted on a total of 302 university students, including 133 (44%) female and 169 (56%) male participants with an age range of 19–47. The mean and standard deviation of age scores, respectively, are 23.83 and 4.57. The mean and standard deviation of EAT-8 are 2.39 and 2.84, respectively.

Internal consistency

Internal consistency was calculated with the total sample of 302 ($n = 302$). For the total sample, the Persian

version of the EAT-8 demonstrated a good internal consistency (KR-20 = 0.91).

Stability over time

Test–retest reliability was calculated for the EAT-8 when using a sample of 31 students who completed the EAT-8 again after 2 weeks. The results showed good test–retest reliability across the EAT-8 with significant ICC between Time 1 and Time 2 scores (ICC = 0.81).

Convergent and divergent validity of the EAT-8

The convergent validity of the EAT-8 was investigated by examining the relationship between EAT-8 with scores on self-report measures of EBQ-18 and EAT-16. The results demonstrated the expected relationship between the EAT-8 with EBQ-18 and EAT-16. Positive correlations were found between the EAT-8 with these two scales ($P < 01$). To evaluate the divergent validity of EAT-8, we examined the association between the EAT-8 and two theoretically less related constructs, including self-compassion and self-esteem. As expected, we found negative correlations between EAT-8 and these two scales ($P < 0.01$) [Table 1].

Confirmatory factor analysis

To assess the construct validity of EAT-8 and determine the fit of the factor structure obtained by Richter *et al.*,[17] confirmatory factor analysis (CFA) was performed. Based on the results of EAT-8, the one-factor model was tested [Table 2]. As it can be observed, the one-factor model fitted the data well. The results showed that the one-factor model had a good fit. However, in our study, χ^2/df was > 3 (4.54), which indicating a poor fit of the data to the original model. Although the results of the Chi-square test were significant, this could be because the Chi-square is sensitive to sample size. The results of the fit indices for this model are summarized in Figure 1.

Discussion

Eating disorders are a group of mental diseases characterized by abnormal eating habits. Eating disorders are a significant cause of morbidity and mortality in adolescent and young adult due to the severe changes

in their eating behaviors. Thus, prevention of eating disorders and identification of high-risk individuals are a crucial issue for general health practice.[22] The EAT-26 is a common tool frequently used in cross-cultural, clinical, and nonclinical samples. However, it is too long when used to rather large samples of the general population. The EAT-8 is a potentially helpful short screen for disordered eating.[22] The aim of the current research was to evaluate the short version EAT-8 as a screening tool for disordered eating in a nonclinical population of students.

The results showed that one factors model had an acceptable fit. These obtained results are also consistent with the examination of the factor structure EAT-8 in a German population.[17] The normal Chi-square should be lesser than 3 for an appropriate model,[43] but in our study, χ^2/df was >3 (4.45), which indicating a poor fit of the data to the original model. Because the Chi-square is sensitive to the sample size and can overestimate the non-fit of the model because with increasing degrees of freedom, the sample size is constant and this can lead to the rejection of acceptable models.[45] Because the Chi-square was higher than acceptable, we used indices that are not sensitive to sample size and are not affected by sample size, such as : CFI, NNFI, SRMR, and RMSEA. Test–retest reliability over 2 weeks with a sample of 31 university students yielded significant ICC for the EAT-8. The EBQ-18 and EAT-16 were used to evaluate convergent validities of the EAT-8. According to the results, it was revealed that EAT-8 had a positive correlation with EBQ-18. These results are in consistent with other study.[38,46] EAT-8 had a positive correlation with EAT-16. These results are in consistent with other study.[22] The results showed that EAT-8 had a negative

Table 1: Convergent and divergent validity of the eating attitudes test-8

Scale	EAT-16	EBQ-18	Self-compassion	Self-esteem
EAT-8	0.83**	0.67**	−0.62**	−0.55**

**Correlation is significant at 0.01 level. EAT-16=Eating Attitudes Test-16, EBQ-18=Eating Beliefs Questionnaire-18, SCS=Self-compassion scale short-form; self-esteem scale

Figure 1: Construct validity of Persian version of Eating Attitudes Test-8

Table 2: Goodness of fit indices for four-factor model of Eating Attitudes Test-16

Fit indices	χ^2	df	χ^2/df	RMSEA	IFI	CFI	SRMR	NNFI	NFI	GFI	RFI	AGFI
Quantity	109.35	20	5/46	0.08	0.97	0.97	0.04	0.96	0.96	0.92	0.95	0.85

CFI=Comparative fit index, NFI=Normed fit index, NNFI=Nonnormed fit index, RMSEA=Root mean square error of approximation, SRMR=Standardized root mean residual, GFI=Goodness of fit index, AGFI=Adjusted goodness of fit index, RFI=Relative fit indices
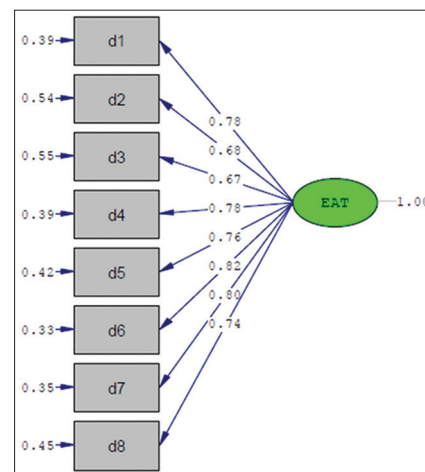
correlation with self-compassion[47,48] and self-esteem.[49,50] Self-compassion can be seen as an emotional strategy in which negative emotions are viewed consciously and creates a sense of shared human experience in the individual. Individuals with high self-compassion are less likely to judge themselves negatively, and they are mindful about negative experiences. However, eating disorders patients who do not consciously deal with grievous events blame themselves and consider themselves the only ones who suffer the utmost from the problems.[51] The results of the CFA supported the application of the one-factor structure in a nonclinical population of students. Because of its shortness, it is an efficient tool appropriate for assessing high-risk groups via self-report or as a first step in screening. Self-esteem increases self-volubility and endurance, and those persons with higher degrees of self-esteem showed lower tendency to behaviors and attitudes of problematic eating.

The main strength of the study is its contribution to screening in nonclinical college samples. This study has several limitations. First, all the scales were self-report tools. Therefore, correlations may have been inflated by common method variance. Second, disordered eating was measured by self-report and not verified by an assessment from a mental health professional. Third, the study sample was restricted to participants with certain demographic characteristics: they were all university students and were often single, young, well-educated, and male. This may lead to a problem of generalizing the results to the general population. The sample is not diverse adequate to be merely relied on as a normative reference in clinical decision-making. In the present research, a short time and a small sample size were used for test–retest reliability. Thus, the psychometric properties of the EAT-8 should be assessed in other communities and related sample groups. Subsequent research will be used for longer periods of time and greater sample sizes for test–retest reliability. Future research is required to examine its validity across different populations (e.g., general population, clinical sample). In addition, it may expand external validation using expert ratings in clinical interviews. All considered results support the use of the short-version EAT-8 as a screening tool of disordered eating in a nonclinical population of students.

Conclusions

The Persian version of EAT-8 showed good and reliable validity to measure disordered eating in a nonclinical population of students. As well as, the study supplements the literature on the cross-cultural validity of this Instrument. Therefore, it helps the existing literature on disordered eating. The results of this paper add to the existing literature on the relevance of the disordered eating that were measured by this questionnaire. The EAT-8 shows notable promise as a measure for use in eating research and clinical practice. It is recommended to use the EAT-8 in other studies. The EAT-8 is a valid screening measure in nonclinical samples.

Conflicts of interest
There are no conflicts of interest.

References

1. Azzouzi N, Ahid S, Bragazzi NL, Berhili N, Aarab C, Aalouane R, *et al.* Eating disorders among Moroccan medical students: Cognition and behavior. Psychol Res Behav Manage 2019;12:129-35.
2. Swanson SA, Crow SJ, Le Grange D, Swendsen J, Merikangas KR. Prevalence and correlates of eating disorders in adolescents. Results from the national comorbidity survey replication adolescent supplement. Arch Gen Psychiatry 2011;68:714-23.
3. Keshaviah A, Edkins K, Hastings ER, Krishna M, Franko DL, Herzog DB, *et al*. Re-examining premature mortality in anorexia nervosa: A meta-analysis redux. Compr Psychiatry 2014;55:1773-84.
4. Smith AR, Velkoff EA, Ribeiro JD, Franklin J. Are eating disorders and related symptoms risk factors for suicidal thoughts and behaviors? A meta-analysis. Suicide Life Threat Behav 2019;49:221-39.
5. Erskine HE, Whiteford HA, Pike KM. The global burden of eating disorders. Curr Opin Psychiatry 2016;29:346-53.
6. Arcelus J, Mitchell AJ, Wales J, Nielsen S. Mortality rates in patients with anorexia nervosa and other eating disorders. A meta-analysis of 36 studies. Arch Gen Psychiatry 2011;68:724-31.
7. Franko DL, Keshaviah A, Eddy KT, Krishna M, Davis MC, Keel PK, *et al*. A longitudinal investigation of mortality in anorexia nervosa and bulimia nervosa. Am J Psychiatry 2013;170:917-25.
8. Sweeting H, Walker L, MacLean A, Patterson C, Räisänen U, Hunt K. Prevalence of eating disorders in males: A review of rates reported in academic research and UK mass media. Int J Mens Health 2015;14. pii: 10.3149/jmh. 1402.86.
9. Smink FR, van Hoeken D, Hoek HW. Epidemiology of eating disorders: Incidence, prevalence and mortality rates. Curr Psychiatry Rep 2012;14:406-14.
10. Le Grange D, Louw J, Russell B, Nel T, Silkstone C. Eating attitude and behaviours in South African adolescents and young adults. Transcult Psychiatry 2006;43:401-7.
11. Celikel FC, Cumurcu BE, Koc M, Etikan I, Yucel B. Psychologic correlates of eating attitudes in Turkish female college students. Compr Psychiatry 2008;49:188-94.
12. Yu J, Lu M, Tian L, Lu W, Meng F, Chen C, *et al*. Prevalence of disordered eating attitudes among university students in Wuhu, China. Nutr Hosp 2015;32:1752-7.
13. Hilbert A, de Zwaan M, Braehler E. How frequent are eating disturbances in the population? Norms of the eating disorder examination-questionnaire. PLoS One 2012;7:e29125.

14. Berger U, Wick K, Hölling H, Schlack R, Bormann B, Brix C, *et al*. Screening of disordered eating in 12-year-old girls and boys: Psychometric analysis of the German versions of SCOFF and EAT-26. Psychother Psychosom Med Psychol 2011;61:311-8.

15. Sanaei H, Dabiran S, Seddigh L. Eating attitudes among adolescent girls in Tehran: A schoolbased survey between 2010-2011. Soc Determ Health 2016;2:98-105.

16. Rouzitalab T, Gargari BP, Izadi A, Amirsasan R, Azarmanesh D, Jafarabadi MA. The prevalence of disordered eating attitude and its relation to exercise participation in a sample of physical education students. Prog Nutr 2019;21:281-7.

17. Pacheco JP, Giacomin HT, Tam WW, Ribeiro TB, Arab C, Bezerra IM, *et al*. Mental health problems among medical students in Brazil: A systematic review and meta-analysis. Braz J Psychiatry 2017;39:369-78.

18. Lazarevich I, Irigoyen-Camacho ME, Mdel CV. Obesity, eating behaviour and mental health among University Students in Mexico City. Nutr Hosp 2013;28:1892-9.

19. Yu Z, Tan M. Disordered eating behaviors and food addiction among nutrition major college students. Nutrients 2016;8:673.

20. Evans EJ, Hay PJ, Mond J, Paxton SJ, Quirk F, Rodgers B, *et al*. Barriers to help-seeking in young women with eating disorders: A qualitative exploration in a longitudinal community survey. Eat Disord 2011;19:270-85.

21. Identifying People at Risk. Available from: http://www.nedc.com.au/identifyin g-people-at-risk. [Last accessed on 2018 Apr 04].

22. Richter F, Strauss B, Braehler E, Altmann U, Berger U. Psychometric properties of a short version of the eating attitudes test (EAT-8) in a German representative sample. Eat Behav 2016;21:198-204.

23. Cumella EJ. Obsessive-compulsive disorder with eating disorders. Am J Psychiatry 1999;156:982.

24. Morgan JF, Reid F, Lacey JH. The SCOFF questionnaire: Assessment of a new screening tool for eating disorders. BMJ 1999;319:1467-8.

25. Killen JD, Hayward C, Wilson DM, Taylor CB, Hammer LD, Litt I, *et al*. Factors associated with eating disorder symptoms in a community sample of 6th and 7th grade girls. Int J Eat Disord 1994;15:357-67.

26. Garfinkel PE, Newman A. The eating attitudes test: Twenty-five years later. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity. 2001 Mar 1;6(1):1-21.

27. Berger U, Hentrich I, Wick K, Bormann B, Brix C, Sowa M, *et al*. Psychometric quality of the "eating attitudes test" (German version EAT-26D) for measuring disordered eating in pre-adolescents and proposal for a 13-item short version. Psychother Psychosom Med Psychol 2012;62:223.

28. Lombardo C, Russo PM, Lucidi F, Iani L, Violani C. Internal consistency, convergent validity and reliability of a brief questionnaire on disordered eating (DEQ). Eat Weight Disord 2004;9:91-8.

29. Austin SB. Accelerating progress in eating disorders prevention: A call for policy translation research and training. Eat Disord 2016;24:6-19.

30. Mousavi Asl E, Mohammadian Y, Gharraee B, Khanjani S, Pazouki A. Assessment of the Emotional Reactivity Through the Positive and Negative Emotions: The Psychometric Properties of the Persian Version of the Perth Emotional Reactivity Scale. Iranian Journal of Psychiatry and Behavioral Sciences. 2020 Aori 26;14 (2).

31. Kline RB. Principles and Practice of Structural Equation Modeling. 4th ed.. New York: Guilford Publications; 2015.

32. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Struct Equ Model Multidiscip J 1999;6:1-55.

33. Garner DM, Rosen LW, Barry D. Eating disorders among athletes. Research and recommendations. Child Adolesc Psychiatr Clin N Am 1998;7:839-57, x.

34. Raes F, Pommier E, Neff KD, Van Gucht D. Construction and factorial validation of a short form of the Self-Compassion Scale. Clin Psychol Psychother 2011;18:250-5.

35. Khanjani S, Foroughi AA, Sadghi K, Bahrainian SA. Psychometric properties of Iranian version of self-compassionscale (short form). Pajoohande 2016;21:282-9.

36. McLaughlin E. The EAT 16: Validation of a Shortened Form of the Eating Attitudes Test; 2014. Available from: https://digitalrepository.unm.edu/psy_etds/94.

37. Mousavias lE, Mahaki B, Bardezard A, Mohammadian Y. Eating disorders screening tools: The psychometric properties of the Persian version of eating attitude test. Int J Prev Med. 2020 [In press].

38. Burton AL, Mitchison D, Hay P, Donnelly B, Thornton C, Russell J, *et al*. Beliefs about binge eating: Psychometric properties of the eating beliefs questionnaire (EBQ-18) in eating disorder, obese, and community samples. Nutrients 2018;10:1306.

39. Asl EM, Mahaki B, Gharraee B, Farid AA, Shahverdi-Shahraki A. Beliefs about binge eating: The psychometric properties of the Persian version of the eating beliefs questionnaire. Journal of Research in Medical Sciences. 2020 Jan 1;25(1):73.

40. Rosenberg M. Society and the adolescent selfimage. New Jersey: Princeton University Press; 2015.

41. Moshki M, Ashtarian H. Perceived health locus of control, self-esteem, and its relations to psychological well-being status in Iranian students. Iran J Public Health 2010;39:70-7.

42. Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, *et al*. Quality criteria were proposed for measurement properties of health status questionnaires. J Clin Epidemiol 2007;60:34-42.

43. Bull SA, James LR, Van Alstine J, Bennett N, Lind S, Stilwell CD. Evaluation of goodness-of-fit indices for structural equation models. Quant Methods Psychol 1989;105:430.

44. Browne MW, Cudeck R. Alternative ways of assessing model fit. Sociol Methods Res 1992;21:230-58.

45. Chermelleh-Engel K, Moosbrugger H, Müller H. Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. Methods Psychol Res 2003;8:23-74.

46. Burton AL, Abbott MJ. The revised short-form of the Eating Beliefs Questionnaire: Measuring positive, negative, and permissive beliefs about binge eating. J Eat Disord 2018;6:37.

47. Fresnics AA, Wang SB, Borders A. The unique associations between self-compassion and eating disorder psychopathology and the mediating role of rumination. Psychiatry Res 2019;274:91-7.

48. Braun TD, Park CL, Gorin A. Self-compassion, body image, and disordered eating: A review of the literature. Body Image 2016;17:117-31.

49. Collin P, Karatzias T, Power K, Howard R, Grierson D, Yellowlees A. Multi-dimensional self-esteem and magnitude of change in the treatment of anorexia nervosa. Psychiatry Res 2016;237:175-81.

50. Linardon J, de la Piedad-Garcia X, Brennan L. Predictors, moderators, and mediators of treatment outcome following manualised cognitive-behavioural therapy for eating disorders: A systematic review. Eur Eat Disord Rev 2017;25:3-12.

51. Steindl SR, Buchanan K, Goss K, Allan S. Compassion focused therapy for eating disorders: A qualitative review and recommendations for further applications. Clin Psychol 2017;21:62-73.