

Psychometric evaluation of the Farsi version of the Body Image Concerns during Pregnancy Scale

Fatemeh Mohamadi ¹, Hana Sohrabi ¹, Marzieh Aslani ^{2*}, Abbas Ebadi ³, Shamsi Zare ⁴, Reza Ghanei Gheshlagh ^{5*}

¹ School of Nursing and Midwifery, Kurdistan University of Medical Sciences, Sanandaj, Iran

² Department of Nursing, Asadabad School of Medical Sciences, Asadabad, Iran

³ Behavioral Sciences Research Center, Life Style Institute, Baqiyatallah University of Medical Sciences, Tehran, Iran

⁴ Department of Obstetrics and Gynecology, School of Medicine, Kurdistan University of Medical Sciences, Sanandaj, Iran

⁵ Social Determinants of Health Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran

* **Corresponding authors:** Marzieh Aslani and Reza Ghanei Gheshlagh, Social Determinants of Health Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.

Email: aslamm63@yahoo.com, rezaghanei30@gmail.com

Received: 26 September 2022 **Revised:** 4 January 2023 **Accepted:** 13 January 2023 **e-Published:** 1 February 2023

Abstract

Background: Body image is a complex concept that encompasses cognitive, affective, perceptual, and behavioral aspects that can change during pregnancy.

Objectives: This study aimed to translate the Body Image Concerns during Pregnancy Scale (BICPS) into Farsi and evaluate its psychometric properties in a sample of pregnant Iranian women.

Methods: The sample consisted of 500 pregnant women attending obstetrics and gynecology clinics in Sanandaj, Asadabad, and Hamadan, Iran. Face and content validity were assessed, and exploratory factor analysis (EFA) was conducted on half of the participants. Confirmatory factor analysis (CFA) was performed on the other half of the participants for model validation. Cronbach's alpha coefficient and McDonald's omega were used to evaluate internal consistency, while the interclass correlation coefficient (ICC) and standard error examination were employed for measuring relative and absolute stability.

Results: EFA revealed five factors: dissatisfaction with body parts and social concerns; concerns about weight and appearance; concerns about skin changes; concerns about abdominal obesity; and concerns about the future. The total variance of the BICPS explained by these factors was 53.86%. Floor and ceiling effects were absent, suggesting adequate item distribution. Internal consistency was high, with both Cronbach's alpha and McDonald's omega exceeding 0.7. CFA demonstrated an acceptable goodness of fit for the F-BICPS model.

Conclusion: The Farsi version of the Body Image Concerns during Pregnancy Scale (F-BICPS) is a reliable and valid instrument for assessing pregnant women's body image concerns.

Keywords: Body image, Pregnancy, Psychometric, Factor Analysis.

Introduction

Body image is a multifaceted construct that encompasses cognitive, affective, perceptual, and behavioral components, reflecting one's beliefs and feelings about their body.¹ Changes in body image happen during various life events, including puberty, pregnancy, postpartum, and menopause.² During pregnancy, women experience rapid

changes in body size and shape, accompanied by physical signs of pregnancy.³ Gaining weight and changes in appearance are normal in pregnancy, with women typically gaining 11–16 kg.⁴ Many women are unable to regain their pre-pregnancy weight or form after giving birth.^{5,6} These anatomical changes may prohibit women from having the body image that society considers ideal.⁷

However, some women may experience difficulties accepting these changes, leading to concerns about their body image, while others may not be affected.⁷⁻⁹

A woman's body image during pregnancy can predict her body image and weight after childbirth.¹ Satisfied body image can lead to lower weight gain after pregnancy. Women with a positive body image before the planned pregnancy have a better response to physical changes during and after childbirth than others.¹⁰ Body image dissatisfaction, produced by the disparity between a woman's actual body image and the culturally imposed ideal body image, can cause significant psychological distress.^{5,11} The body image perception of pregnant women may vary depending on the culture they are in. During pregnancy, women generally have three main body image concerns: their appearance during pregnancy, changes in different parts of their bodies, and the ease of returning to their previous shape and weight.^{12,13} Body image disturbance during pregnancy has been linked to negative health outcomes, including depression, eating disorders, and attachment problems in mothers, as well as obesity, early termination of breastfeeding, and low self-esteem, with adverse consequences for their children.¹⁴⁻¹⁶

Most body image assessment instruments do not specifically target the pregnant population, and those that do are often outdated, necessitating the development of newer instruments that cater to varying cultural needs.¹⁷ The Body Image Concern During Pregnancy Scale (BICPS) is a recently developed, culturally appropriate assessment tool with excellent psychometric properties, designed in Turkey and compatible with Iranian culture. It has just 23 items divided into four subscales, including avoidance and social concerns, concerns about weight gain, concerns about the future, and concerns about physical appearance.²

Objectives

The subject of concern over one's body image during pregnancy may seem trivial; however, it can have severe implications for both mother and baby. Thus, in order to accurately assess this issue, a valid and reliable instrument is required. The instrument must have a limited number of items with simple and understandable statements. To

meet this need, the current study aims to investigate the psychometric properties of the Farsi version of the Body Image Concerns during Pregnancy Scale (BICPS) in Iranian pregnant women.

Methods

Sample and setting

A total of 500 pregnant women were recruited from obstetrics and gynecology clinics in Sanandaj (Kurdistan province), Asadabad, and Hamadan (Hamedan province) using convenience sampling from January to February 2021. A sample size of 200 to 300 is required for exploratory factor analysis. Furthermore, a sample size of at least 200 is recommended for confirmatory factor analysis.^{18,19} Inclusion criteria included being willing to participate in the study, having the ability to read and write, and having a gestational age of over four weeks. The participants were randomly divided into two groups: one underwent exploratory factor analysis, and another underwent confirmatory factor analysis. Data from incomplete questionnaires were removed from the analysis.

Measures

The Body image concerns during pregnancy scale (BICPS)

The participants completed a demographic form and the Body Image Concerns during Pregnancy Scale (BICPS), which was originally developed in Turkey and has 23 items rated on a 5-point Likert-type scale, with higher scores indicating more body image concerns. The BICPS has four subscales: avoidance and social concerns (10 items), concerns about weight gain (5 items), concerns about the future (4 items), and concerns about physical appearance (4 items). The scale was translated into Farsi using a forward-backward method.²

Translation process

After obtaining permission from the author of the scale, it was translated into Farsi using the forward-backward method.²⁰ In the first step, two translators independently translated the original version of the scale into Farsi. Then, the translated version was given to five pregnant women who were asked to read the items aloud, answer the

questions, and determine the items they found ambiguous. We sent this version to 10 experts and asked them to examine the content of the items. After applying experts' opinions, we developed the final Farsi version. In the next step, the Farsi version was translated into English by two other translators; this translation was compared to the original version of the scale by the research team.

Data analysis

SPSS 16 and Lisrel 8.8 were used to analyze the data. The demographic description of the sample and means, standard deviations, frequency estimates, and percentages were reported.

Floor and ceiling effects were calculated to ensure the content validity of the Farsi version of the scale; effects were considered present if more than 15% of participants obtained the lowest or highest scores.²¹ The Kaiser-Meyer-Olkin (KMO) coefficient was used to assess sampling adequacy for factor analysis, with a value of 0.7 or more indicating suitability. Bartlett's test of sphericity was used to examine the correlation matrix between variables. Latent variables were extracted using maximum likelihood and maximum rotation, with a cutoff point of 0.30 being considered for factor loadings. Confirmatory factor analysis (CFA) was performed on the second group (n=300). The goodness-of-fit of the model was assessed using relative chi-square, Minimum Discrepancy Function by Degrees of Freedom divided (CMIN/DF), the goodness-of-fit index (GFI), the comparative fit index (CFI), the normed fit index (NFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Acceptable cutoff points for goodness-of-fit indexes were $\chi^2/df \leq 2$, GFI, CFI, and NFI > 0.95, RMSEA < 0.06, and SRMR < 0.08. Internal consistency was calculated using Cronbach's alpha coefficient and McDonald's omega, while relative stability of the scale was assessed using the interclass correlation coefficient (ICC) with two-way mixed effects at a 95% confidence interval (95% CI) with acceptable values greater than 0.75%. Absolute stability was calculated by assessing the standard error of measurement (SEM), while the minimal detectable change (MDC) was calculated using the formula $SEM = SD_{\text{baseline}} \times \sqrt{1 - ICC}$ and $MDC = 1.96 \times \sqrt{2} \times SEM$. All data analysis was

conducted using SPSS 16 and Lisrel 8.8 software.^{22,23}

Ethical considerations

Ethical approval for the present study was obtained from the Ethics committee at Asadabad University of Medical Sciences (IR.ASAUMS.REC.1399.028). Study objectives were explained to participants, questionnaires remained anonymous, and participants were reassured that their personal information remained confidential.

Results

The study consisted of a sample of 500 pregnant women who were referred to medical clinics in Sanandaj, Asadabad, and Hamadan. The women had a mean age of 27.94 ± 5.98 years, with an age range of 15 to 42 years. The mean age of husbands was 32.25 ± 6.02 years, with an age range of 19 to 50 years. The mean gestational age was 28.52 ± 8.07 weeks. Out of the total participants, 48.8% (244) were first-time pregnant, and 34.8% (174) had previously been pregnant. Most of the women and husbands had a high school education. Additionally, 139 (27.8%) women worked outside the home. The specific demographic data has been presented in Table 1.

To ensure face and content validity, the study incorporated participant feedback and expectations by dividing two lengthy statements into shorter ones. After performing face and content validity, the study compiled a clear and easily understandable Persian version, which was approved by the original designer.

Construct validity

Exploratory factor analysis

The study assessed construct validity using exploratory factor analysis. In examining the face and qualitative content validity, feedback was obtained from qualified experts, including nurses, and minor changes were made to some of the statements. As demonstrated by appropriate skewness and kurtosis scores, the data exhibited a normal distribution. Additionally, the KMO coefficient was 0.866, and Bartlett's test of specificity was significant ($X^2=2630.674$, $df=253$, $p=0.001$), indicating good construct validity.

Factor analysis using Maximum Likelihood and Promax rotation resulted in the identification of five factors, which

cumulatively explained 53.86% of the total variance. The first factor (dissatisfaction with body parts and social concerns) comprised of 7 items (#2, #4, #9, #10, #11, #12, and #16), the second factor (concerns about abdominal obesity) comprised of 5 items (#17, #18, #19, #20, and #21), the third factor (concerns about weight and appearance) comprised of 4 items (#5, #6, #9, #7, and #8), the fourth factor (concerns about skin changes) comprised of 3 items (#3, #13, and #14), and the fifth factor (concerns about the future) comprised of 2 items (#22 and #23). The five factors accounted for 30.262%, 10.098%, 5.020%, 4.867%, and 2.839% of the total variance, respectively, with eigenvalues of 7.444, 2.787, 1.662, 1.477, and 1.066, respectively. Items #1 and #15 did not belong to any factor and were excluded from further analysis. The total scale had zero percent floor and ceiling effects.

Confirmatory factor analysis

The study tested the fitness of the five-factor model using confirmatory factor analysis. The results indicated that the proposed model had a good fit for the data, with the following goodness fit indices: RMSEA = 0.063, CMIN/DF = 2.6, NFI = 0.96, NNFI = 0.97, CFI = 0.98, IFI = 0.98, GFI = 0.88, RFI = 0.95, and SRMR = 0.049. Figure 1 provides a visual representation of the results of the confirmatory factor analysis.

Reliability

Furthermore, the questionnaire exhibited high relative stability (ICC) with a two-week interval (0.953; 95% CI: 0.915–0.980, P<0.001). The results of the examination of absolute stability showed a SEM of 3.85 and an MDC of 5.43 [Table 2].

Table 1. The characteristics of participants

Variables	N	%
Literacy (Women)		
Primary school	38	7.6
High school	220	44
Academic	242	48.4
Literacy (Men)		
Primary school	25	5
High school	218	43.6
Academic	257	51.4
Occupation (Women)		
Employed	139	27.8
Unemployed	361	72.8
Occupation (Men)		
Employed	487	97.4
Unemployed	13	2.6
Number of pregnancies		
0	244	48.8
1	174	34.8
More than 1	82	16.4

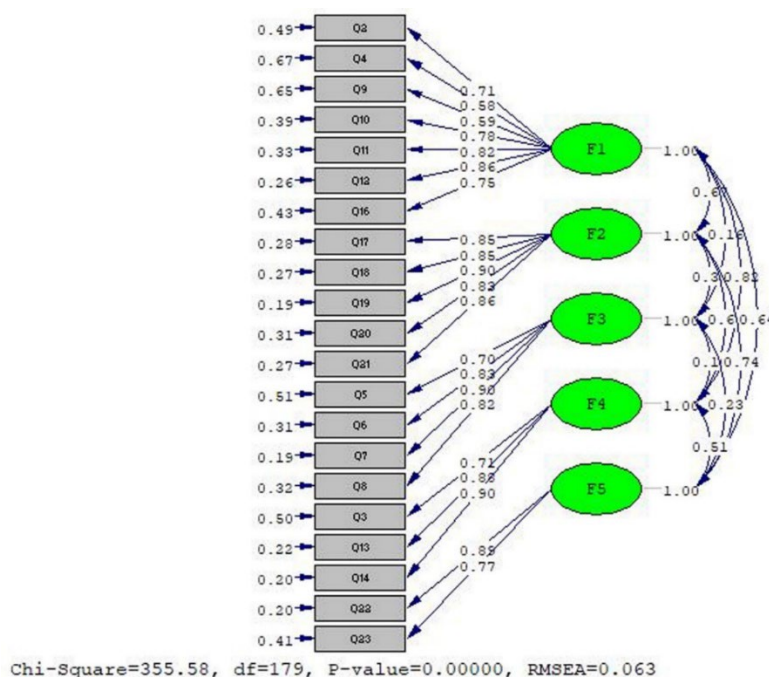


Figure 1. Final model

Table 2. Exploratory factor analysis of the Body Image Concerns during Pregnancy Scale (BICPS) (n=250)

Factors	Items	h^2	Factor loading	% variance	Eigenvalue	Internal consistency
Dissatisfaction with Body Parts and Social Concerns	10- I do not like myself due to swelling in my body parts (hands, feet, face...)	0.575	0.828	30.262	7.444	$\alpha = 0.853$
	11- I hate my body image when I am naked.	0.549	0.799			$\Omega = 0.774$
	9- I feel that this body does not belong to me.	0.416	0.707			
	12- I get upset when I see my body in the mirror.	0.461	0.570			
	4- It upsets me when I cannot wear my favorite clothes.	0.587	0.516			
	2- I get upset when people comment on my body image.	0.449	0.434			
	16- I avoid social activities because of changes in my body image.	0.461	0.416			
Concerns about Weight and Appearance	19- I am worried that I may not be able to return to my average weight after giving birth.	0.709	0.931	10.098	2.787	$\alpha = 0.890$
	21- I am worried about my body shape after giving birth.	0.692	0.812			$\Omega = 0.749$
	20- I fear that the physical changes I experience during pregnancy may be permanent.	0.685	0.795			
	18- I feel I have become too bulky due to gaining weight.	0.634	0.737			
	17- I am worried I may not be able to return to weight before pregnancy.	0.492	0.617			
Concerns about Skin Changes	8- I am not worried about marks on my face and body.	0.609	0.807	5.020	1.662	$\alpha = 0.828$
	7- I am not worried about increased hair on my belly and other body parts.	0.660	0.780			$\Omega = 0.823$
	6- I am not worried about stretch marks on my belly.	0.556	0.755			
	5- I am not worried about marks on my face.	0.421	0.625			
Concerns about Abdominal Obesity	13- When I am with others, I try to hide my baby bump.	0.762	0.916	4.867	1.477	$\alpha = 0.804$
	14- When someone takes a picture of me, I try to hide my baby bump.	0.562	0.702			$\Omega = 0.840$
	3- I try to wear clothes that cover my baby bump.	0.483	0.629			
Concerns about the Future	23- I would consider plastic surgery after pregnancy if I could afford it.	0.606	0.796	2.839	1.066	$\alpha = 0.617$
	22- I am worried my husband may not find me attractive after giving birth.	0.379	0.525			$\Omega = 0.781$

Discussion

The Body Image Concerns During Pregnancy Scale (BICPS) is a valid and reliable instrument used to assess pregnant women's concerns about body image and changes in their appearance. In this study, the psychometric properties of the Farsi version of the scale were evaluated. While the original BICPS has four factors, the Farsi version has five factors based on the EFA. These factors included dissatisfaction with body parts, social concerns, concerns about abdominal obesity, concerns about weight and appearance, concerns about skin changes, and concerns about the future, which together accounted for more than half of the total variance of body image concerns during pregnancy.² However, the Farsi version had 21 items, two less than the original version, as two items were removed due to low factor loading.

The first factor (dissatisfaction with body parts and social concerns) refers to dissatisfaction with various body parts and not participating in social activities due to changes in physical appearance. Dissatisfaction with body parts was also a factor in the original version of the BICPS.²⁴ This factor had ten items in the original version of the scale, but in the Farsi version, items #1, #13, and #14 were not loaded on it. Due to a lower factor loading, item #1 was not loaded on any factor, and item #13 (When I am with others, I try to hide my baby bump.) and #14 (when someone takes a picture of me, I try to hide my baby bump) and #3 (I try to wear clothes that cover my baby bump) together formed a separate factor. These items, which all refer to hiding the baby bump, share a similar concept that is consistent with the shame factor in the Prenatal Body Image Questionnaire.²⁵ Dissatisfaction with body parts has been shown to be common during pregnancy, with many pregnant women having ambivalent feelings about their body image.^{7,26} The first factor had the highest number of items and explained the highest amount of variance; therefore, it has an essential role in measuring body image perceptions in pregnant women.

The second factor, concerns about abdominal obesity, existed in the Turkish version (BICPS), with five items (#3, #15, #17, #18, and #19). However, item #15 was removed in the Farsi version because of a low factor loading, and item #3, referring to the salience of the abdomen, formed

the factor of concerns about abdominal obesity. Thus, this factor in the Farsi version consists of the remaining three items from the original version (items #17–19) and two items (#20 and #21) from the concerns about the future factor in the original version. These items had excellent placement on the Farsi version of the BICPS. Weight gain complaints are common among pregnant women, despite knowing its significance for fetal growth,²⁷ and women rarely return to their pre-pregnancy shape after pregnancy, making many unprepared for these physical changes.^{5,28,29}

The items of the third factor were the same in both the Farsi and Turkish versions of the scale (items #5 to #8). In the original version of the scale, this factor is called “concerns about appearance,” but its items are focused on pregnant women’s concerns about spots on the face, lines on the abdomen, increased hair growth, and acne during pregnancy. Accordingly, the factor was renamed concerns about skin and hair in the Farsi version. The term appearance refers to the whole body, while the items mentioned above specifically refer to skin changes during pregnancy. Skouteris et al. found that pregnant women are likely to feel less attractive than when not pregnant.³⁰

The fourth factor was concerns about abdominal obesity and included items #3, #13, and #14. It is worth noting that the Prenatal Body Image Questionnaire developed by Sohrabi et al. in Iran also has a factor called “lower body fat,” which refers to the enlargement of the pelvis during pregnancy, consistent with the factor extracted in this study.²⁶

The fifth and final factor (concerns about the future) included two items, item #22 (concerns about not being attractive) and item #23 (I would consider plastic surgery after pregnancy if I could afford it), which were combined with items #20 (fear that the physical changes are permanent) and #21 (I am worried about my body shape after giving birth) to form the concerns about the future factor in the Turkish version. The congruence between these factors appears to be higher in the Farsi version than in the Turkish version.

The Farsi version of the scale showed good fit indices, and all subscales had good internal consistency except for the fifth subscale, which only had two items. Due to only having two items, the fifth subscale had a lower Cronbach's

alpha estimate. Pregnant women may adjust their body image standards to adapt to rapid bodily changes.^{16,34} However, concerns about body image may differ during different stages of pregnancy and in the pre- and post-pregnancy periods. Some studies have shown that body image is relatively stable in this period^{31,32} and may even show improvements compared to pre-pregnancy.^{33,34}

The absence of a ceiling or floor effect showed that the scale was neither too simple nor too complicated for participants. Ceiling and floor effects occur when individuals score close to the maximum or minimum of a scale, making it challenging to determine the true extent of their abilities or difficulties. The internal consistency was acceptable, as evaluated by both Cronbach's alpha coefficient and McDonald's omega.^{35,36} In the Farsi version, unlike the original version, the absolute stability of SEM and MDC was found to be 3.85 and 5.43, respectively. SEM=3.85 indicates that if there is a 3.84-point change in the total score after the intervention, we can be 95% confident that an actual change has occurred in body image concerns during pregnancy. One of the notable strengths of our study is the cultural similarity between Turkey and Iran, which supports the use of the BICPS in Iranian populations. However, it should be noted that participants in our study were limited to those from the Kurdistan and Hamadan provinces of Iran, which may reduce the generalizability of our findings to other regions.

Conclusions

Pregnancy brings about physiological changes that require pregnant women to adapt to their changing bodies. Failure to adjust may lead to physical and psychological consequences. To measure such concerns, the Farsi Version of the Body Image Concerns during Pregnancy Scale (F-BICPS) is a valid and reliable instrument. Therefore, this instrument can adequately assess pregnant women's concerns about their body image.

Acknowledgment

The researchers would like to express their gratitude to the Asadabad University of Medical Sciences for approval of this research project. We also thank all the participants in this study. We also thank Aylin Ghanei Gheshlagh for her

cooperation in translating this article.

Competing interests

The authors declare that they have no competing interests.

Abbreviations

BICPS: Body image concerns during pregnancy scale;
F-BICPS: Farsi version of body image concerns during pregnancy scale;

EFA: Exploratory factor analysis;

CFA: Confirmatory factor analyses;

ICC: Interclass correlation coefficient.

Authors' contributions

AF and RGG: manuscript preparation and study conceptualization; MA, HS, and SZ: data collection and manuscript preparation; RGG and FM: study design; AE and RGG: final revision and grammar editing; AE: statistical analysis. All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

Funding

This study was funded by the Asadabad University of Medical Sciences (No. IR.ASAUMS.REC.1399.028). The funding body had no role in the design of the study, data collection, interpretation of the result or in writing the manuscript.

Role of the funding source

None.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

According to the standards of ethics in research, the objectives of the study were explained to the research participants, and their written informed consent was obtained to participate in the study. They were assured during the investigation that the information contained in the questionnaires would remain confidential. This study is the result of the project approved by the Asadabad University of Medical Sciences (IR.ASAUMS.REC.1399.028).

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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Cite this article as:

Mohamadi F, Sohrabi H, Aslani M, Ebadi A, Zare S, Ghanei Gheshlagh R. Psychometric evaluation of the Farsi version of the Body Image Concerns during Pregnancy Scale. *Novel Clin Med.* 2023;2(1):39-47. doi:10.22034/NCM.2023.363635.1057