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# The psychometric properties and validity of the Turkish version of the Body Image in Pregnancy Scale (BIPS-Turkish)

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**ABSTRACT**

In our study, we aimed to assess the validity and reliability of the Turkish version of the Body Image in Pregnancy Scale (BIPS). A total of 220 pregnant women participated in the study. The content validity of the scale was evaluated by the content validity index (CVI) and its construct validity was evaluated by confirmatory factor analysis (CFA). The reliability of the scale was assessed with internal consistency analysis, item analysis, test–retest reliability, and parallel forms reliability. After the modification, the t values, factor loadings and fit indices of the scale items were at a good and acceptable level ($\chi 2$ = 1114.57, df = 505, $\chi 2$/df = 2.20, RMSEA = 0.07, SRMR = 0.07, CFI = 0.95, GFI = 0.90). Hence, a 34-item, 7-factor construct was confirmed for the Turkish version of the BIPS. Cronbach's alpha internal consistency coefficient of the overall scale was 0.90 and Cronbach's alpha internal consistency coefficients of the subscales were within the range of 0.65–0.94. Test-retest and parallel forms reliability of the scale were at a sufficient level. In conclusion, it was determined that BIPS can be used as a valid and reliable measurement tool to evaluate body image perceptions of Turkish pregnant women.

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Body image; pregnant; reliability; validity

## Introduction

Body image can be defined as the subjective picture of the body, regardless of how the body actually looks (Shoraka, Amirkafi, and Garrusi 2019). The concept of body image is a complex construct comprising one's thoughts, feelings, evaluations, and behaviors about one's own body (Spreckelsen et al. 2018). Despite its conceptual and methodological challenges, the number of studies on body image has increased recently (Ferreira, Castro, and Morgado 2014). In this regard, the body image of some specific populations, especially of pregnant women, is of great interest to researchers (Derya, Uğur, and Özşahin 2020; Erbil 2019; Fuller-Tyszkiewicz et al. 2020; Gumusay, Erbil, and Demirbag 2021; Kocaöz, Gördeles Beşer, and Kızılırmak 2020; Mbada et al. 2020; Meireles et al. 2017; Plante et al. 2020). Although some recent studies have identified variables associated with body image in pregnant women (Collings, Hill, and Skouteris 2018; Derya, Uğur, and Özşahin 2020; Fahami, Amini-Abchuyeh, and Aghaei 2018; Hartley et al. 2016; Hill et al. 2016; Kocaöz, Gördeles Beşer, and Kızılırmak 2020; Radoš, Vraneš, and Šunjić 2014; Roomruangwong et al. 2017), the lack of an appropriate body image measurement tool specific to pregnancy draws attention in the literature (Meireles et al. 2015; Watson etal. 2017). In studies published in recent years in our country, Turkey, general body image scales have been used to evaluate body image during pregnancy (Bacacı and Apay 2018; Derya, Uğur, and Özşahin 2020; Erbil 2019; Gumusay, Erbil, and Demirbag 2021; Güney and Uçar 2018; Gür and Pasinlioğlu 2020; Kocaöz, Gördeles Beşer, and Kızılırmak 2020; Kumcağız 2012).

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To evaluate body image in pregnancy, Bacacı and Apay (2018), Gür and Pasinlioğlu (2020) used Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Winstead and Cash 1984). Derya, Uğur, and Özşahin (2020), Özkan, Küçükkelepce, and Özkan (2020), Balaydın, Kızıltan, and Apay (2020) and Şeker et al. (2020) used the Body-Cathexis Scale (BCS) (Secord and Jourard 1953), Mbada et al. (2020) used The Body Attitude Questionnaire (Ben-Tovim and Walker 1991) and The Body Shape Questionnaire (Conti, Cordas, and Latorre 2009), Fahami, Amini-Abchuyeh, and Aghaei (2018) used The Body Image Rating scale (Souto and Garcia 2002), Kazmierczak and Goodwin (2011) used the Body Image Questionnaire (Mirucka 2005), and Shloim et al. (2015) used the Stunkard Figure Rating Scale (Stunkard, Sorensen, and Schlusinger 1983). In fact, pregnancy is a very special and critical period in which body weight and size increase in a relatively short period of 40 weeks (Fuller-Tyszkiewicz et al. 2012). The process with these unique changes can sometimes be challenging in pregnant women's lives. Most pregnant women tend to reassess body image due to physiological changes in body composition. Besides, women must psychologically adapt to these changes. Some women may find it difficult to keep up with these physical changes occurring during the pregnancy period. This can negatively affect body image (Skouteris et al. 2005).

Negative body image has been associated with smoking, impaired maternal–fetal attachment, limited eating, obesity, decreased intention to breastfeed (Fuller-Tyszkiewicz et al. 2013) decreased self-esteem, depression (Fuller-Tyszkiewicz et al. 2013; Silveira et al. 2015), sexual dysfunction (Derya, Uğur, and Özşahin 2020), and increased anxiety (DiPietro et al. 2003). It has been reported in the literature that these negative effects may adversely affect infant development and even result in miscarriage (Araujo et al. 2008; Watson et al. 2015). However, weight gain during pregnancy can also be perceived as 'temporary,' which can prevent the emergence of negative body images (Loth et al. 2011; Watson et al. 2015). The inconsistency of these findings reflects the complexity of body image during pregnancy, which, until now, has not been fully understood. Moreover, the different designs and measurement instruments employed in these studies can make comparisons between studies difficult (Fuller-Tyszkiewicz et al. 2012; Loth et al. 2011). Furthermore, the measurement instruments used in the studies are not specific to pregnant women and therefore may not reflect a woman's concerns specific to pregnancy (Meireles et al. 2015; Watson et al. 2017).

Realizing this gap and inconsistency in the literature, Watson et al. (2017) needed a conceptual and methodological improvement and developed the Body Image in Pregnancy Scale (BIPS). The scale is available in English (Watson et al. 2017), German (Nagl, Jepsen, and Linde et al. 2019), and Portuguese (De Oliveira, de Carvalho, and Veiga 2020) versions. Nevertheless, there is still a need to assess the validity and reliability of BIPS in the context of other cultures. At a time when studies on body image during pregnancy continue to be relevant, especially in Turkey (Bacacı and Apay 2018; Derya, Uğur, and Özşahin 2020; Erbil 2019; Gumusay, Erbil, and Demirbag 2021; Güney and Uçar 2018; Gür and Pasinlioğlu 2020; Kocaöz, Gördeles Beşer, and Kızılırmak 2020), it is deemed important to assess the validity and reliability of the Turkish version of BIPS. Indeed, Watson et al. (2017), who developed the original scale, also recommended the use of BIPS in different populations. In the present study, the aim was to conduct the validity and reliability study of the Turkish version of the BIPS and to bring it in the literature.

## Materials and methods

### *Design and setting*

This methodological study was carried out in Burdur province, located in the Mediterranean region of Turkey. The first stage of the validity and reliability study was the translation – back translation process. During the translation process, experts and pregnant women were consulted. The scale was first translated into Turkish by two people independently of each other (Coster and Mancini 2015). Then, expert opinions were obtained, which enabled us to test the scale's face validity and content validity. During the face validity study, the experts' opinions were questioned to find out whether the

questions in the measurement tool were clearly related to the information on the subject examined. During the content validity study, on the other hand, we, the researchers, and the experts worked together on shared definitions by questioning whether the items in the measurement tool could represent the topics they were aimed at measuring in a balanced way. During this stage, the items were also evaluated in terms of the different reactions due to the way the items were presented (Brown 2015). For the construct validity, confirmatory factor analysis (CFA) was performed. It is recommended to perform exploratory factor analysis (EFA) if there is no known relationship between the scale items, and to perform CFA if there is a tested relationship between the scale items and if the factors and items collected under these factors are determined (Bandalos and Finney 2010; Kline 2011). Confirmatory Factor Analysis is used when there is a strong model assumption. With CFA, whether the structure, whose existence has been proven before, is compatible with a new data set is investigated. In scale development studies, it is recommended that CFA should be used to test the validity of the structure obtained through EFA (Brown 2015; Worthington and Whittaker 2006).

The next stage was the reliability phase (Brown 2015). Among the elements used in the reliability studies of the measurement tools are the Cronbach's alpha internal consistency coefficient (LoBiondo Wood and Haber 2018), item-total correlation (Buyukozturk 2017), test–retest reliability, and parallel forms reliability (Brown 2015). While the Cronbach's alpha internal consistency coefficient and item-total correlation coefficient were used at the reliability study stage of this scale, test–retest reliability was used for the stability of the scale over time, and Pearson correlation test was used for the parallel forms reliability.

### Sample

According to the International Test Commission guidelines (International Test Commission 2018), the sample size should be at least 200 to reveal the psychometric structure of a scale. Considering possible dropouts, 250 participants were invited to the study. Nineteen participants did not agree to participate in the study. Eleven participants did not respond to all of the scale items. As a result, the study was completed with 220 pregnant women. Of the pregnant women, those who were over the age of 18, who gave their written and verbal informed consent indicating they volunteered to participate in the study, who did not have any known psychological disorders, who were able to read, understand and write in Turkish, and who answered all of the study questions were included in the study.

### Research instruments

The data were collected using a sociodemographic/obstetric form, Body Image in Pregnancy Scale (BIPS), and Body-Cathexis Scale (BCS).

Sociodemographic/obstetric form: Developed by the researchers, the form consists of questions aimed at determining participants' demographic and obstetric characteristics, such as age, gestational week, and economic status.

Body Image in Pregnancy Scale (BIPS): BIPS was developed by Watson et al. (2017) to measure pregnant women's perceptions of physical and mental changes in their bodies. The scale consists of 36 items and seven subscales [F1 (preoccupation with physical appearance) (items 1, 2, 3, 4, 35, and 36), F2 (dissatisfaction with strength-related aspects of one's body) (items 15, 16, 17, 18, 19, 20, and 21), F3 (dissatisfaction with complexion) (items 22–25), F4 (sexual attractiveness) (items 5–8, and 9), F5 (prioritization of appearance over function) (items 10–14), F6 (appearance-related behavioral avoidance) (items 32–34), F7 (dissatisfaction with body parts) items (26–31)]. The scale has Likert-type items and items from 1 to 14 are scored as (1 = strongly disagree, 5 = strongly agree), items from 15 to 31 are scored as (1 = very satisfied, 5 = not satisfied at all) and items from 32 to 36 are scored as (1 = never engaged in the behavior, 5 = regularly engages in the behavior). Items 7, 8, 10, 11, 12, 13, and 14 are reversely scored. Cronbach's alpha coefficients of the subscales in the original scale were calculated as

follows: F1(0.92), F2(0.92), F3(0.87), F4(0.88), F5(0.89), F6(0.69), F7(0.83). Higher scores indicate a more negative body image. The results regarding the adaptation of the scale to Turkish culture are given below. Turkish version of the scale is presented in the Appendix 1.

Body-Cathexis Scale: The scale was developed by Secord and Jourard in 1953, and adapted to Turkish by Hovardaoğlu in 1992. Developed to measure one's satisfaction with 40 different body parts or functions, the scale contains 40 5-point Likert-type items (1 = quite like it, 5 = don't like it at all). The lowest and highest scores to be obtained from the scale are 40 and 200, respectively. Higher scores indicate higher dissatisfaction from body parts or functions. Cronbach's alpha reliability coefficient of the scale was reported as 0.91 (Hovardaoğlu 1992).

## Procedure

### Translation of the BIPS

First, permission was obtained via e-mail from the developer of the original scale to use BIPS in this study. The original English scale was translated into Turkish by two experts proficient in both languages. Then, the translated Turkish form was back-translated into English by two independent experts who were not included in the study group. Back-translation is an important procedure to test the correct translation of the scale items and should be carried out by translators with no knowledge of the subject of the research (International Test Commission 2018; World Health Organization 2020). The back-translated scale items were compared with the original scale items, and the items with major differences in meaning were revised.

### Content validity of the BIPS

Once the translation process was finished, eight experts were asked to assess the linguistic and cultural appropriateness of the items. Experts scored the scale items using a 4-point Likert-type scoring (1 = not appropriate at all, 4 = very appropriate). The researchers and six of the experts decided that it would be more understandable to use not the word "fonksiyon" but the word "işlev" although both of them are the Turkish equivalents of the English word "function" included in the items 12, 13, and 14. The word "işlev" was used throughout the scale as the translated form of the English word 'function.'

### Pilot test of the BIPS

Following the content validation of the scale, a pilot test was administered to 12 pregnant women. It was observed that these 12 participants had no difficulty in understanding the items, so the Turkish version of the scale was finalized. For test–retest reliability, the scale was re-administered to 70 pregnant women after a four-week interval. The data obtained from the participants of the pilot study and of the test–retest reliability study were not included in the study.

## Data collection

The data were collected at Burdur state hospital by second researcher. Body Image in Pregnancy Scale (BIPS) and Body-Cathexis Scale (BCS) as a parallel form were administered at the same time, based on self-reporting. After a four-week interval, retest data were collected.

## Data analysis

Data were analyzed with the Statistical Package for the Social Sciences (SPSS version 21.0) and Lisrel 8.0 software package program, and statistical significance was set at $p < .05$. Descriptive statistics were used to analyze the characteristics of the sample. The inter-expert consistency rate is reported to be minimum 0.80 for the content validity (LoBiondo Wood and Haber 2018). To test the construct validity of the scale, confirmatory factor analysis (CFA) was performed and $x^2$/df test, Comparative Fit

Index (CFI), Goodness-of-Fit Index (GFI), Standardized Root Mean Square Residuals (SRMR), and Root Mean Square Error of Approximation (RMSEA) fit indices were used. Acceptable goodness-of-fit values were accepted as >0.90 for CFI, <0.08 for RMSEA, <0.1 for SRMR (Durmus, Cinko, and Yurtkoru 2018; Esin 2014; Hair etal. 2010), ≥0.90 for GFI (Hooper, Coughlan, and Mullen 2008) and x $^2$/df as 5 (Durmus, Cinko, and Yurtkoru 2018; Esin 2014; Hair et al. 2010). For the reliability of the scale, the Cronbach's alpha internal consistency coefficient was evaluated with the item total correlation coefficient. Test–retest reliability was used to test time invariance, and parallel forms reliability was analyzed using Pearson correlation test. To ensure reliability, Cronbach's alpha coefficient should be at least 0.70, and item total correlation coefficients should be in the range of 0.30–0.70 (Buyukozturk 2012).

### *Ethical considerations*

Prior to the study, ethics committee approval was obtained from Mehmet Akif Ersoy University Ethics Committee (GO2017/83). Also, before data collection, institutional permission from the Provincial Health Directorate and written consent from pregnant women were obtained. Approval was obtained from the developer of the original scale to remove the items from the scale.

## Results

### *Participants*

The mean age of the participants was 27.43 ± 5.39 (min = 18, max = 46). 31.4% of them were in the second trimester, and 43.6% were in the third trimester. 61.8% reported that they were unemployed, and 41.8% reported good income levels. 51.8% were in their first pregnancy (Table 1).

### *Means, standard deviations, BIPS factors*

The mean score the participants obtained from the scale was 81.80 ± 20.30. The mean scores they obtained from the sub-dimensions ranged between 6.03 ± 2.44 and 19.10 ± 7.60 (Table 2).

**Table 1.** Participants characteristics (*N* = 220).

| Characteristics | | Mean ± Sd | Min-Max |
|---|---|---|---|
| Age | | 27.43 ± 5.39 | 18–46 |
| | | n | % |
| Pregnancy Week | 1.Trimester | 55 | 25.0 |
| | 2.Trimester | 69 | 31.4 |
| | 3.Trimester | 96 | 43.6 |
| Education Status | Primary school | 60 | 27.3 |
| | High school | 54 | 24.5 |
| | University | 106 | 48.2 |
| Employment Status | Employed | 54 | 24.6 |
| | Unemployed | 136 | 61.8 |
| | Interrupted due to pregnancy | 30 | 13.6 |
| Income Status | Expenditure < Income | 92 | 41.8 |
| | Expenditure > Income | 75 | 34.1 |
| | Income = Expenditure | 53 | 24.1 |
| Number of Pregnancies | Primigravida | 114 | 51.8 |
| | Multigravida | 106 | 48.2 |

Abbreviations: Sd, Standard Deviation; min, Minimum value; max, Maximum value

**Table 2.** Means, standard deviations, BIPS factors ($N$ = 220).

| Variables | Mean ± Sd | Range (Min-max) |
|---|---|---|
| BIPS total score | 81.80 (20.30) | 42.00–143.00 |
| Preoccupation with physical appearance | 14.37 (5.64) | 6.00–28.00 |
| Dissatisfaction with strength-related aspects of one's body | 19.10 (7.60) | 7.00 – 35.00 |
| Dissatisfaction with complexion | 18.00 (4.14) | 4.00–20.00 |
| Sexual attractiveness | 7.75 (2.83) | 3.00–15.00 |
| Prioritization of appearance over function | 11.95 (4.48) | 5.00–25.00 |
| Appearance-related behavioral avoidance | 6.03 (2.44) | 3.00–15.00 |
| Dissatisfaction with body parts | 14.20 (5.95) | 6.00–30.00 |

Abbreviations: Sd, Standard Deviation; min, Minimum value; max, Maximum value

### *Content validity*

Content validity of the scale was assessed with feedback obtained from eight experts. Accordingly, the CVI of the scale was calculated as 0.87 and the mean item score as 3.50 (min = 3, max = 4). Since the pilot test administered to 12 pregnant women yielded no incomprehensible items, no revisions were made to the scale.

### *Construct validity of the BIPS*

CFA was performed to evaluate the fit of the factor structure of the original BIPS in the data obtained from the Turkish sample. The fit/unfit coefficients obtained as a result of the CFA are given in Table 3. As seen in Table 3, the x2/df value was found to be 2.20. In the present study, the value was between 2 and 5, which indicates that the model is acceptable. The table first presents the general fit/unfit coefficients of the theoretical model. They are followed by the second model proposed based on modification suggestions (Table 3). In the theoretical model, the t values of items 7 and 8 were lower than 1.96. Therefore, these two items were removed from the scale. The diagram examined later showed that the t values and factor loadings of the items were in the desired range. When the fit indices were examined, it was seen that the RMSEA value was 0.08. Based on modification suggestions, error covariance was added between items 25 and 23. Thus, the fit index values of the scale were in the desired range ($\chi2$ = 1114.57, df = 505, $\chi2$/df = 2.20, RMSEA = 0.07, SRMR = 0.07, CFI = 0.95, GFI = 0.90) (Table 3), (Figure 1).

### *Internal consistency*

Cronbach's alpha internal consistency coefficient of the scale was calculated as 0.90. Cronbach's alpha internal consistency coefficients of the subscales were calculated as follows: F1 (0.84), F2 (0.94) F3 (0.86), F4 (0.65), F5 (0.81), F6 (0.86), and F7 (0.87). Removal of any items from the scale did not lead to any variation in the Cronbach's alpha level (Table 4).

### *Test-retest reliability (time invariance)*

For time invariance, the scale was re-administered after a four-week interval. The means of the scores obtained in both measurements were compared, and no difference was found (t = −1.31, $p$ = .19).

### *Parallel (equivalent) forms reliability*

A significant, moderate correlation was found between BIPS and BCS (r = 0.39 $p$ < .01).

**Table 3.** Confirmatory factor analysis results.

| Model | $\chi^2$/p | df | $\chi^2$/df | GFI | CFI | RMSEA | SRMR |
|---|---|---|---|---|---|---|---|
| Theoretical | 14110.02/0.00 | 573 | 2.46 | 0.77 | 0.92 | 0.08 | 0.08 |
| Suggested | 1114.57/0.00 | 505 | 2.20 | 0.90 | 0.95 | 0.07 | 0.07 |
| * Good fit values | - | - | $0 \leq \chi 2/df \leq 2$ | $0.95 \leq GFI \leq 1.00$ | $0.95 \leq CFI \leq 1.0$ | $0.00 \leq RMSEA \leq 0.05$ | $0.00 \leq SRMR \leq 0.05$ |
| *Acceptable fit values | - | - | $2 \leq \chi 2/df \leq 3$ | $0.90 \leq GFI < 0.95$ | $0.90 \leq CFI < 0.95$ | $0.05 < RMSEA \leq 0.08$ | $0.05 < SRMR \leq 0.10$ |

*note*. χ2: Chi-Square; df: Degrees of Freedom; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual; CFI: Comparative Fit Index, GFI: Goodness of Fit index

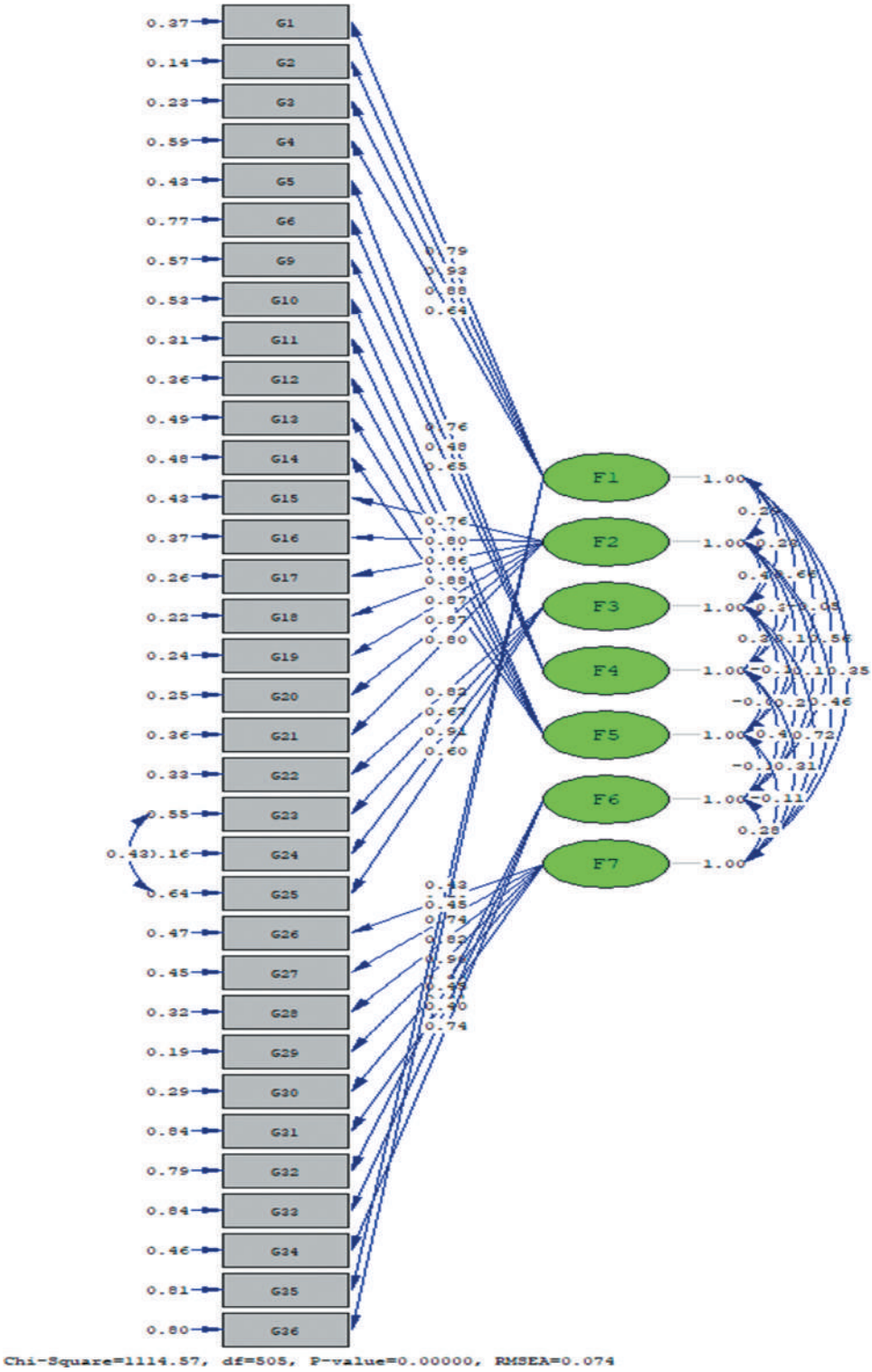


**Figure 1.** Model after modification recommendations.

**Table 4.** Scale item analysis results.

| Factors | Items | Mean | Sd | If item deleted | Cronbach Alfa |
|---|---|---|---|---|---|
| F1 Preoccupation with physical appearance | I-1 | 2.42 | 1.23 | 0.90 | 0.84 |
| | I-2 | 2.50 | 1.25 | 0.89 | |
| | I-3 | 2.41 | 1.22 | 0.90 | |
| | I-4 | 2.50 | 1.34 | 0.90 | |
| | I-35 | 2.26 | 1.12 | 0.90 | |
| | I-36 | 3.05 | 1.40 | 0.90 | |
| F2 Dissatisfaction with strength-related aspects of one's body | I-15 | 2.43 | 1.12 | 0.90 | 0.94 |
| | I-16 | 2.25 | 1.15 | 0.90 | |
| | I-17 | 2.40 | 1.14 | 0.90 | |
| | I-18 | 2.31 | 1.05 | 0.90 | |
| | I-19 | 2.49 | 1.10 | 0.90 | |
| | I-20 | 2.47 | 1.09 | 0.90 | |
| | I-21 | 2.39 | 1.25 | 0.89 | |
| F3 Dissatisfaction with complexion | I-22 | 2.80 | 1.28 | 0.90 | 0.86 |
| | I-23 | 2.75 | 1.26 | 0.89 | |
| | I-24 | 2.78 | 1.25 | 0.89 | |
| | I-25 | 2.76 | 1.28 | 0.89 | |
| F4 Sexual attractiveness | I-5 | 2.80 | 1.23 | 0.89 | 0.65 |
| | I-6 | 2.80 | 1.25 | 0.90 | |
| | I-9 | 2.15 | 1.28 | 0.89 | |
| F5 Prioritization of appearance over function | I-10 | 1.97 | 1.17 | 0.89 | 0.81 |
| | I-11 | 2.13 | 1.24 | 0.89 | |
| | I-12 | 2.12 | 1.21 | 0.89 | |
| | I-13 | 2.30 | 1.23 | 0.89 | |
| | I-14 | 2.18 | 1.16 | 0.89 | |
| F6 Appearance-related behavioral avoidance | I-32 | 2.33 | 1.31 | 0.89 | 0.86 |
| | I-33 | 2.14 | 1.24 | 0.89 | |
| | I-34 | 2.06 | 1.20 | 0.89 | |
| F7 Dissatisfaction with body parts | I-26 | 3.17 | 1.45 | 0.90 | 0.87 |
| | I-27 | 2.15 | 1.10 | 0.90 | |
| | I-28 | 2.10 | 1.21 | 0.90 | |
| | I-29 | 1.77 | 1.00 | 0.90 | |
| | I-30 | 2.21 | 1.19 | 0.90 | |
| | I-31 | 2.30 | 1.26 | 0.90 | |

## Discussion

This study is the first study adapting BIPS to Turkish culture. As a result of the study, the seven-factor and 34-item construct of the scale was confirmed by CFA, and the t values and factor loadings of all items were found to be at acceptable levels. Also, test–retest reliability, parallel forms reliability, and internal consistency values were at acceptable levels. These results suggest that BIPS can be used as a valid and reliable measurement tool to evaluate body image perceptions in Turkish pregnant women.

### *Discussion of validity results*

To test whether a scale and its items measure the variable to be measured, validity should be evaluated. There are several methods to measure the validity of a scale. In this study, the content and construct validity of the scale were evaluated. In the literature, a consistency ratio of 0.80 and a mean item score of three or above are considered as the necessary criteria for content validity (LoBiondo Wood and Haber 2018). The evaluation made by an expert in this study revealed that the content validity of the Turkish BIPS was sufficient.

In cross-cultural adaptation studies of a scale, to test the construct validity of the scale, its compatibility with the original scale is tested by CFA (Esin 2014). In order to comment on the fit of the model resulting from CFA, the items' t values, factor loadings, and goodness-of-fit results are taken into account (Çapık, Gözüm, and Aksayan 2018). The t-values of each item in the model should be

above 1.96. If the t value of an item does not meet this requirement that item should be removed or modified (Schumacker and Lomax 2010). Then, it is necessary to check the factor loadings of the items in the model. As stated by Harrington (2009), factor loadings should not be below 0.30. Following these processes, the goodness of fit results are checked, and the fit of the model is finally determined. In the literature, acceptable values for fit indices for a model obtained from CFA were reported as $x^2$/df <5, CFI>.90 (Durmus, Cinko, and Yurtkoru 2018; Esin 2014), GFI≥.90 (Hooper, Coughlan, and Mullen 2008), RMSEA<.08, and SRMR<0.1 (Durmus, Cinko, and Yurtkoru 2018; Esin 2014).

In confirmatory factor analysis, the $x^2$, one of the fit indices, is expected not to be significant; however, in practice, it is generally found to be significant because it is very sensitive to sample size. Instead, the $x^2$ value is divided by the degrees of freedom ($x^2$/df), and a value of ≤2 indicates that the model is a good model, and a value of ≤5 indicates that the model has an acceptable goodness-of-fit (Hooper, Coughlan, and Mullen 2008; Polit and Beck 2010). In the present study, the chi-square test yielded a significant *p* value, consistent with the literature. Therefore, the $x^2$/df value was taken into account. The model has an acceptable goodness of fit.

In this study, in the theoretical model of the scale, the t values of the two items were not sufficient. These two items were removed from the scale, upon which factor loadings were found to be at an acceptable level. Finally, the goodness-of-fit results did not yield acceptable RMSEA values, so based on modification suggestions, error covariance was added between items 25 and 23 (Brown 2015). After the modification, the t values, factor loadings, and fit indices of the scale items were at a good and acceptable level. This result suggests that the model is able to sufficiently explain the desired construct. In the study adapting BIPS to Portuguese, exploratory factor analysis was performed, which resulted in a 6-factor and 35-item construct, unlike the original scale (De Oliveira, De Carvalho, and Veiga 2020). On the other hand, the exploratory factor analysis performed in the study adapting BIPS to German resulted in the removal of four items and yielded a 7-factor and 32-item construct (Nagl et al., 2019). Neither of the mentioned studies performed CFA. These results show that the factor structure of the measurement tool differed among cultures.

### *Discussion of reliability results*

To test the reliability of scales, time invariance, and internal consistency should be tested. To ensure that a scale is time-invariant, there should be no difference between the mean scores obtained in the test–retest (LoBiondo Wood and Haber 2018). The test–retest method is the administration of the same measurement tool to the same group at an interval and the determination of the difference between the two administrations. The expected result is that the stability of the measurement tool does not change over time. In the present study, the retest was administered four weeks after its first administration (Gozum and Aksayan 2003; Polit and Beck 2010). In thepresent study, there was no statistically significant difference between the mean scores obtained, which suggests that the first and second measurement results of the scale were consistent. This test–-retest result indicates that the scale is reliable.

Another method to test the time invariance of a scale (the stability of the scale over time) is parallel forms reliability (Seçer 2015). In body image studies conducted with pregnant women in recent years in our country, the Body-Cathexis Scale has been used mostly, and the reliability values in those studies have been high (Balaydın, Kızıltan, and Apay (2020); Derya, Uğur, and Özşahin 2020; Özkan, Küçükkelepce, and Özkan 2020; Şeker et al. 2020). Therefore, it was considered that the Body-Cathexis Scale would be the most appropriate measurement tool for the parallel forms reliability for our country and it was decided to use it as a parallel scale. In this study, BCS was used as a parallel form, and the Pearson correlation value between the two scales was found to be positively and moderately significant (Esin 2014). This result suggests that the results of the two scales were consistent.

For internal consistency, Cronbach's alpha coefficient is calculated, and this value represents the correlation between scale items. For a scale to be considered reliable, the Cronbach's alpha coefficient should be as close to 1 as possible and over 0.70 (DeVellis 2016). Cronbach's alpha coefficient in the range of 0.80–1.00 indicates high reliability, 0.60–0.80 indicates fair reliability, 0.40–0.60 indicates low reliability,

and 0.00–0.40 indicates that the scale is not reliable. In this study, the Cronbach's alpha values of the scale and of its subscales indicated fair and high reliability. Cronbach's alpha coefficient of Factor 4 (sexual attractiveness) was below 0.70. Indeed, this value was below 0.70 in the original scale, as well (Watson et al. 2017). Since two items of this subscale were removed from the scale, the number of items in the scale decreased. This may have affected the Cronbach's alpha value. Similarly, in the Brazilian version of the scale, this sub-dimension had the lowest Cronbach's alpha value (0.70), and the name of the sub-dimension was changed to "Attractiveness" (De Oliveira, De Carvalho, and Veiga 2020). In the German version, the Cronbach's alpha value of this sub-dimension was 0.83 (Nagl, Jepsen, and Linde et al. 2019). Values, beliefs, and behaviors associated with individuals' sexuality reveal much about the broader beliefs and values of the society in which they live or come from. Researchers revealed the evidence of how culture and society shape sexuality (Agocha, Asencio, and Decena 2014). Therefore, that the content of sexual attractiveness sub-dimension varies from one culture to another is an expected result. This subscale assesses pregnant women's perceptions of their own sexual attractiveness. Since sexual attractiveness is considered a taboo subject in our culture, pregnant women may have had difficulties responding to the items of this subscale.

## Limitations

The data were collected from a single hospital in this study. The results may not be generalizable for other samples.

## Conclusions

In conclusion, BIPS can be used as a valid and reliable measurement tool to evaluate body image perceptions of Turkish pregnant women. Further research can be conducted to test the validity and reliability of the scale in different samples.

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**Appendix.1.** Turkish form of the Body Image in Pregnancy Scale (BIPS)

| Aşağıda, gebelik sırasında vücudunuzun çeşitli yönleriyle ilgili ifadelerin bir listesi bulunmaktadır. Lütfen şu anki gebeliğinizi ve gebelik haftanızı düşünerek cevap verin. | **Kesinlikle Katılmıyorum** | **Katılmıyorum** | **Kararsızım** | **Katılıyorum** | **Kesinlikle Katılıyorum** |
|---|---|---|---|---|---|
| (1) Gebelik kilomu düşünerek çok zaman harcıyorum. | | | | | |
| (2) Gebelikteki aldığım kiloları düşünerek çok zaman harcıyorum. | | | | | |
| (3) Gebeliğim sırasında vücut şeklimi düşünerek çok zaman harcıyorum | | | | | |
| (4) Gebeliğim de daha ince bir bedene sahip olmayı istiyorum. | | | | | |
| (5) Gebeyken eşimin bedenimi çıplak görmesini istemiyorum. | | | | | |
| (6) Başkalarının gebeliğimde bedenimi çıplak görmesini istemiyorum. | | | | | |
| (7) Gebelikte bedenimi cinsel yönden seviyor ve beğeniyorum.* | | | | | |
| (8) Gebelikte bedenimi çekici buluyorum.* | | | | | |
| (9) Gebelikte eşimin bedenimi çekici bulmamasından endişe duyuyorum. | | | | | |
| (10) Gebelikte bedenimin nasıl göründüğünden çok benim nasıl hissettiğim önemlidir. | | | | | |
| (11) Gebelikte bedenimin görüntüsünden çok ne yapabildiğimle ilgileniyorum. | | | | | |
| (12) Gebelikte bedenimin görüntüsünden çok işlevleriyle ilgileniyorum. | | | | | |
| (13) Gebelikte memelerimin görüntüsünden çok işlevleriyle ilgileniyorum. | | | | | |
| (14) Gebelikte karnımın görüntüsünden çok işlevleriyle ilgileniyorum. | | | | | |
| Aşağıda, gebelik sırasında vücudunuzdaki değişikliklerle ilgili duygularınızı soran soruların bir listesi bulunmaktadır. Lütfen şu anki gebeliğinizi ve gebelik haftanızı düşünerek cevap verin. | **Oldukça memnunum** | **Biraz memnunum** | **Kararsızım** | **Memnun Değilim** | **Kesinlikle Memnun Değilim** |
| (15) Gebelikte kas gücünüzden memnunsunuz? | | | | | |
| (16) Gebeliğinizle ilgili vücut esnekliğinizdeki değişikliklerden memnunsunuz? | | | | | |
| (17) Gebeliğinizle ilgili gücünüzdeki değişikliklerden memnunsunuz? | | | | | |
| (18) Gebeliğinizle ilgili enerji düzeyinizdeki değişikliklerden memnunsunuz? | | | | | |
| (19) Gebeliğinizle ilgili kas gücünüzdeki değişikliklerden memnunsunuz? | | | | | |
| (20) Gebeliğinizle ilgili değişen beden esnekliğinizden memnunsunuz? | | | | | |
| (21) Gebeliğinizle ilgili değişen gücünüzden memnunsunuz? | | | | | |
| (22) Gebeliğinizle ilgili yüzünüzün görünümünden memnunsunuz? | | | | | |
| (23) Gebeliğinizde saçlarınızdan memnunsunuz? | | | | | |
| (24) Gebeliğinizle ilgili cilt rengi değişimlerinizden memnunsunuz? | | | | | |
| (25) Gebeliğinizle ilgili saçlarınızdaki değişikliklerden memnunsunuz? | | | | | |
| (26) Gebeliğinizde göğüs bölgenizden memnunsunuz? | | | | | |
| (27) Gebeliğinizde omuz genişliğinizden memnunsunuz? | | | | | |
| (28) Gebeliğinizde ayak bileklerinizden memnunsunuz? | | | | | |
| (29) Gebeliğinizde kollarınızdan memnunsunuz? | | | | | |

(*Continued*)

**Appendix.1.** (Continued).

| | | | | | |
|---|---|---|---|---|---|
| (30) Gebeliğinizde ellerinizden memnunsunuz? | | | | | |
| (31) Gebeliğinizde bedeninizdeki su tutulumundan (ödem) memnunsunuz? | | | | | |
| Aşağıda gebelik sırasındaki davranışlarınız hakkında sorulan soruların bir listesi bulunmaktadır. Lütfen şu anki gebeliğinizi ve gebelik haftanızı düşünerek cevap verin | **Hiç Yapmadım** | **Nadiren Yaptım** | **Bazen Yaptım** | **Sık Yaptım** | **Sürekli Yaptım** |
| (32) Gebelikte bedeniniz sarsılacağı için egzersiz yapmaktan kaçınır mısınız? | | | | | |
| (33) Gebelikte bedeninizi beğenmediğiniz için sosyal aktivitelere (piknik vb.)gitmediğiniz olur mu? | | | | | |
| (34) Gebeliğinizde kendinizi daha ince hissetmek için yediklerinizi kısıtladınız mı? | | | | | |
| (35) Gebelikteki beden şekliniz hakkında endişelendiğiniz için egzersiz yapmanız gerektiğini düşünüyor düşünür müsünüz? | | | | | |
| (36) Gebelikteki kilonuz hakkında endişelendiğiniz için egzersiz yapmanız gerektiğini düşünür müsünüz? | | | | | |

**Note**:* Items 7 and 8 were removed from the Turkish version.