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RESEARCH ARTICLE (ORIGINAL)

Body Image Concerns During Pregnancy Scale: Translation and validation for the Portuguese population

Escala de Preocupação com a Imagem Corporal Durante a Gravidez: Tradução e validação para a população portuguesa

Escala de Preocupação com a Imagem Corporal Durante a Gravidez: traducción y validación para la población portuguesa

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Abstract

Background: Body image concerns during pregnancy can lead to a number of problems. Understanding these concerns can help health professionals improve health care for pregnant women.

Objective: Translate, adapt, and validate the Body Image Concerns During Pregnancy Scale for the Portuguese population (*Escala de Preocupação com a Imagem Corporal Durante a Gravidez* - EPICDG).

Methodology: A quantitative cross-sectional study was conducted with 231 pregnant women. The psychometric properties of the EPICDG were assessed using exploratory and confirmatory factor analysis.

Results: The fit indices of the Portuguese 21-item version were identical to those of the original scale. The four-dimension model had the best fit ($X^2(176) = 446.320$; $p < 0.001$, X^2df = 2.536; CFI = 0.91; TLI = 0.89; GFI = 0.86; RMSEA = 0.077, $p < 0.001$).

Conclusion: The results show that the EPICDG has adequate psychometric properties for assessing body image concerns during pregnancy in the Portuguese population.

Keywords: body image; pregnancy; validity; reliability

Resumo

Enquadramento: As preocupações com a imagem corporal durante a gravidez podem ter diversos problemas. A compreensão destas preocupações podem ajudar os profissionais de saúde a melhorarem os cuidados com a saúde das grávidas.

Objetivo: Adaptar e validar para a população portuguesa a Body Image Concern Scale During Pregnancy, que foi traduzida Escala de Preocupação com a Imagem Corporal Durante a Gravidez (EPICDG).

Metodologia: Estudo quantitativo e transversal, participaram 231 grávidas. A avaliação das propriedades métricas da EPICDG foi realizada com base na análise fatorial exploratória e confirmatória.

Resultados: A versão portuguesa com 21 itens, apresentou índices de ajuste idênticos à escala original. O modelo com melhor qualidade, foi o modelo com as quatro subdimensões da escala original ($X^2(176) = 446,320$; $p < 0,001$, X^2df = 2,536; CFI = 0,91; TLI = 0,89; GFI = 0,86; RMSEA = 0,077, $p < 0,001$).

Conclusão: Os resultados demonstram que a validação da escala para a língua portuguesa, tem propriedades psicométricas adequadas para a avaliação das preocupações com a imagem corporal durante a gravidez.

Palavras-chave: imagem corporal; gravidez; validade; fiabilidade

Resumen

Marco contextual: La preocupación por la imagen corporal durante el embarazo puede causar diversos problemas. Comprender estas preocupaciones puede ayudar a los profesionales sanitarios a mejorar los cuidados a las mujeres embarazadas.

Objetivo: Adaptar y validar para la población portuguesa la *Body Image Concerns During Pregnancy Scale*, que fue traducida en la Escala de Preocupação com a Imagem Corporal Durante a Gravidez (EPICDG).

Metodología: Estudio cuantitativo transversal en el que participaron 231 mujeres embarazadas. Las propiedades métricas de la EPICDG se evaluaron mediante análisis factorial exploratorio y confirmatorio.

Resultados: La versión portuguesa con 21 ítems mostró índices de ajuste idénticos a los de la escala original. El modelo con mejor calidad fue el que tenía las cuatro subdimensiones de la escala original ($X^2(176) = 446,320$; $p < 0,001$, X^2df = 2,536; CFI = 0,91; TLI = 0,89; GFI = 0,86; RMSEA = 0,077, $p < 0,001$).

Conclusión: Los resultados muestran que la validación de la escala para el idioma portugués tiene propiedades psicométricas adecuadas para evaluar las preocupaciones sobre la imagen corporal durante el embarazo.

Palabras clave: imagen corporal; embarazo; validez; fiabilidad

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Introduction

Societal norms have shaped the beauty of human beings, which can affect cultural practices and social interaction (Laughter et al., 2023). Individual differences in bodily beauty can sometimes be affected by the gaze of people who judge themselves to be aesthetically unattractive (Kuipers, 2022). In Western media, cultural trends have attempted to shift the paradigm of body image According to McComb and Mills (2022), women today tend to desire a curvier body, characterized by a large butt and thighs, a small waist, and a flat abdomen. Studies have shown that exposure to idealized images in the media increases body image dissatisfaction among women (Carter & Vartanian, 2022).

The concept of body image is multidimensional and encompasses a woman's mental image of herself, including the size and shape of her body, as well as her feelings and experiences related to body image (Legrand et al., 2020; Tylka, 2019). The experience of being pregnant can elicit contradictory feelings in women, making body image concerns during pregnancy a topic of interest (Güney & Uçar, 2018; Khosravi et al., 2023).

This study aims to assess the psychometric properties of the Portuguese version of the Body Image Concerns During Pregnancy Scale (BICDPS), which was translated and adapted for the Portuguese population.

Background

During pregnancy, women's bodies undergo significant changes that can impact their perception of body image (Lavender, 2007; Lee & Damhorst, 2022). These changes can include an increase in body weight and volume, as well as changes to the breasts (Musaei, 2023; Uçar et al., 2018). Uçar et al. (2018) developed a reliable instrument to measure body image concerns during pregnancy.

Identifying body image concerns during pregnancy is important to identify the most affected aspects of body image during pregnancy (Fuller-Tyszkiewicz et al., 2012) and help health professionals provide appropriate support to pregnant women. Excessive body image concerns during pregnancy may cause mental health problems such as anxiety, depression, and eating disorders (Brunton et al., 2020; Simbar et al., 2020). Thus, using an instrument enables health professionals to monitor psychological aspects and intervene when necessary. Additionally, it assists them in providing information to design strategies that ensure guidance and support for pregnant women dealing with insecurity and anxiety related to their body image (Mueller & Grylka-Baeschlin, 2023; Tavares et al., 2023).

Understanding body image concerns during pregnancy can be useful for improving information and counseling during and after childbirth (Chan et al., 2020; Riquin et al., 2019). It is also important to help women adapt to changes in their bodies while remaining focused on their baby's health and well-being (Finlayson et al., 2020; Hannon et al., 2022). Tavares et al. (2023) argue that understanding the impact of body image on the decision to breastfeed is crucial for health professionals to develop effective strategies. According to Uçar et al (2018), traditional scales for assessing women's body image to identify concerns about physical appearance during pregnancy are inaccurately used. Therefore, validating this scale for the Portuguese population will contribute to understanding the social and cultural factors that influence the perception of body image during pregnancy. A better understanding of the social and cultural impact can help adapt health and support programs for different groups of women.

Research question

Is the Body Image Concerns During Pregnancy Scale (Uçar et al., 2018) a valid and reliable tool for assessing body image perception during pregnancy in the Portuguese population?

Methodology

This study was included in the project titled *influência da imagem corporal na decisão de amamentar* (The influence of body image on the decision to breastfeed), which was submitted for evaluation to and approved by the Ethics Committee of the University of the Azores (Opinion 3/2022). This study used the translation and back-translation methodology and psychometric analysis. After receiving authorization from the authors, the instrument was translated and adapted following the guidelines for the cross-cultural instrument translation, namely the respect for equivalence in item translation, operational equivalence, scalar equivalence, and metric equivalence (Borsa et al., 2012; Hernández et al., 2020). The items were translated from English into Portuguese by three translators, one with a degree in general psychology, one with a Ph.D. in clinical and health psychology, and one with a Ph.D. and specialization in midwifery. The initial translation was administered to 10 women with different levels of education (Leeuw et al., 2008). A translator with a Ph.D. in Education then blindly back-translated the items into English.

The original authors were sent the scale and comments on certain items and requested a comparison between the two versions. Once all the translated items were approved, a sociodemographic questionnaire was created to obtain participant data. The research protocol was made available online through Facebook and in print, which was distributed by nurses in various health units on the island of São Miguel, Autonomous Region of the Azores. The inclusion criteria were: i) pregnant women, ii) being at least 18 years old, and iii) having read the informed consent form. This form allowed participants complete freedom to voluntarily take part in the study.

The sample consisted of 278 women selected randomly. After applying the inclusion criteria, 47 participants were excluded, resulting in a final sample of 231 pregnant women. These women were on average 30.48 years

(*SD* = 5.59), lived in mainland Portugal (*n* = 47), the Autonomous Region of the Azores (*n* = 173), and the Autonomous Region of Madeira (*n* = 11). Regarding their marital status, they were single (*n* = 38), married (*n* = 121), divorced (*n* = 4), or in a civil partnership (*n* = 65). Regarding education level, participants had completed the 4th grade (*n* = 7), the 6th grade (*n* = 29), 9th grade (*n* = 28), 12th grade (*n* = 86), or higher education (*n* = 80). Three participants did not answer the question about marital status, and one did not answer the question about education level. Concerning the trimester of pregnancy, 18 participants were in the first trimester, 94 were in the second trimester, and 119 were in the third trimester.

The BICDPS (Uçar et al., 2018) consists of 23 self-response items that are rated on a Likert-type scale (1 = *I definitely disagree*, 2 = *I disagree*, 3 = *Undecided*, 4 = *I agree*, 5 = *I definitely agree*). Items 5, 6, 7, 8 and 15 are calculated inversely. The scale is comprised of four subdimensions: Avoidance and social concerns (items 1, 2, 4, 9, 10, 11, 12, 13, 14, and 16), Concerns about weight gain (items 3, 15, 17, 18, and 19), Concerns about the future (items 20, 21, 22, and 23), and Concerns about physical appearance (items 5, 6, 7, and 8). The scale has a maximum score of 115 points and a minimum of 23. Higher scores indicate greater concerns about body image during pregnancy, while lower scores indicate lower levels of body image concerns.

The revised Body Appreciation Scale (BAS-2) was developed by Tylka and Wood-Barcalow (2015) and translated and adapted for the Portuguese population by Marta-Simões et al. (2016). It measures feelings and thoughts related to body image through a single-item scale consisting of 10 self-response items (1 = *Never*, 2 = *Seldom*, 3 = *Sometimes*, 4 = *Often*, and 5 = *Always*). Higher scores indicate a positive perception of body image, while lower scores indicate a negative perception.

Statistical analysis was conducted using IBM SPSS software, version 28.0 for MacOS and AMOS21 for Windows. An exploratory factor analysis (EFA) was performed, and Cronbach's alphas (α) were checked to assess the correlation between the items to measure the theoretical construct. Subsequently, Pearson's correlation coefficient (*r*) was used to determine the intensity and direction of the relationship between the subdimensions of the BICDPS and BAS-2. After conducting the confirmatory factor analysis (CFA) using maximum likelihood estimation, the overall quality of fit of the factor model was assessed through the Chi-square goodness of fit test (X^2). An X^2/df ratio of less than 5 was considered acceptable. Based on the Comparative Fit Index (CFI), the Goodness of Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA), a good fit is indicated when the indices are close to 1. The RMSEA should be less than 0.05 (Marôco, 2021a, 2021b).

Results

Concerning reliability, the Cronbach's α coefficient for the 21-item scale was 0.89. The subdimensions showed the following coefficients: 0.84 for Avoidance and social concerns, 0.82 for Concerns about weight gain, 0.83 for Concerns about the future, and 0.86 for Concerns about physical appearance. The Kaiser-Meyer-Olkin measure was used to analyze the quality of the data, revealing the adequacy of the sampling and the homogeneity of the variables (KMO = 0.867; X^2(253) = 2967.600, *p* < 0.001). After analyzing the communalities of the variables using the principal component analysis extraction method, communalities were very low for item 3 (0.35) and item 15 (0.26). For this reason, these items were deleted, which maintained structural adequacy (KMO = 0.868; X^2(210) = 2842.16, *p* < 0.001). The communality of the remaining 21 items was higher than 0.50.

Item-total correlations were moderately high, ranging from 0.32 to 0.77. Table 1 shows the factor loadings for the items in the Portuguese version, while Table 2 displays the results for each model.

Table 1

Standardized factor loadings of the four-factor model for the EPICDG (N = 231)

	Item	Statement	Factor loading
Avoidance and social concerns	1	Sinto-me menos atraente por causa da minha gravidez.	0.80
	2	Os comentários sobre a minha imagem corporal relacionada com a minha gravidez, incomodam-me.	0.67
	3	Chateia-me não poder usar as roupas que gosto.	0.64
	8	Sinto como se o meu corpo não me pertencesse.	0.68
	9	Não gosto de mim por causa do inchaço no meu corpo (mãos, rosto, pés, etc).	0.63
	10	Fico incomodada com o aspeto do meu corpo quando estou nua.	0.65
	11	Fico incomodada com o meu aspeto quando me olho ao espelho.	0.65
	12	Tento esconder a minha barriga quando estou com outras pessoas.	0.89
	13	Tento esconder a minha barriga quando são tiradas fotografias.	0.91
	14	Evito atividades sociais por causa das alterações da minha aparência.	0.67
Concerns about weight gain	15	Preocupa-me que aumente demasiado peso.	0.88
	16	Sinto-me volumosa por causa do peso que aumentei.	0.82
	17	Preocupa-me não ser capaz de perder o peso que aumentei, após o nascimento.	0.87
Concerns about the future	18	Preocupa-me que a postura corporal que desenvolvi durante a gravidez, seja permanente.	0.82
	19	Preocupa-me a forma como o meu corpo vai ficar após nascimento.	0.84
	20	Preocupa-me que o meu companheiro não me ache atraente após o nascimento.	0.81
	21	Se pudesse pagar, consideraria a cirurgia plástica após o nascimento, para parecer como quem eu era antes da gravidez.	0.79
Concerns about physical appearance	4	Não me preocuparia ter marcas de gravidez faciais. (cloasma)*	0.82
	5	Não me preocuparia ter estrias na minha barriga. *	0.85
	6	Não me preocuparia com um aumento de pelos no meu corpo e na minha barriga. *	0.84
	7	Não me preocuparia em ter acne (espinhas/espigos) no meu corpo e rosto. *	0.84

*Reversed item

Table 2

Assessment of the Quality of the Factor model

	Type of model	Quality of the factor model
1	Unidimensional	$X^2(189) = 1528.179$; $p < .001$. X^2df = 8.086; CFI = 0.51; TLI = 0.45; GFI = 0.54; RMSEA = 0.176. $p < 0.001$ SRMR = 0.1435
2	Second-order	$X^2(185) = 755.417$; $p < .001$. X^2df = 4.083; CFI = 0.79; TLI = 0.76; GFI = 0.75; RMSEA = 0.116. $p < 0.001$ SRMR = 0.0985
3	Four-dimensional	$X^2(183) = 749.368$; $p < .001$. X^2df = 4.095; CFI = 0.79; TLI = 0.76; GFI = 0.75; RMSEA = 0.116. $p < 0.001$ SRMR = 0.0954
4	Adjusted second-order	$X^2(176) = 446.320$; $p < .001$. X^2df = 2.536; CFI = 0.90; TLI = 0.88; GFI = 0.84; RMSEA = 0.082. $p < 0.001$ SRMR = 0.0876
5	Adjusted four-dimensional**	$X^2(176) = 408.014$; $p < .001$. X^2df = 2.372; CFI = 0.91; TLI = 0.89; GFI = 0.86; RMSEA = 0.077. $p < 0.001$ SRMR = 0.0753

Note. X^2/df = Chi-square/degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; Goodness of Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

As shown in Table 2, the four-factor model had the best fit, which was refined with the highest covariances presented through the modification index in Figure 1.

Figure 1

Confirmatory factor analysis of the EPICDG X2(176) = 446.320; p < 0.001, X2df = 2,536; CFI = 0.91; TLI = 0.89; GFI = 0.86; RMSEA = 0.077, p < 0.001
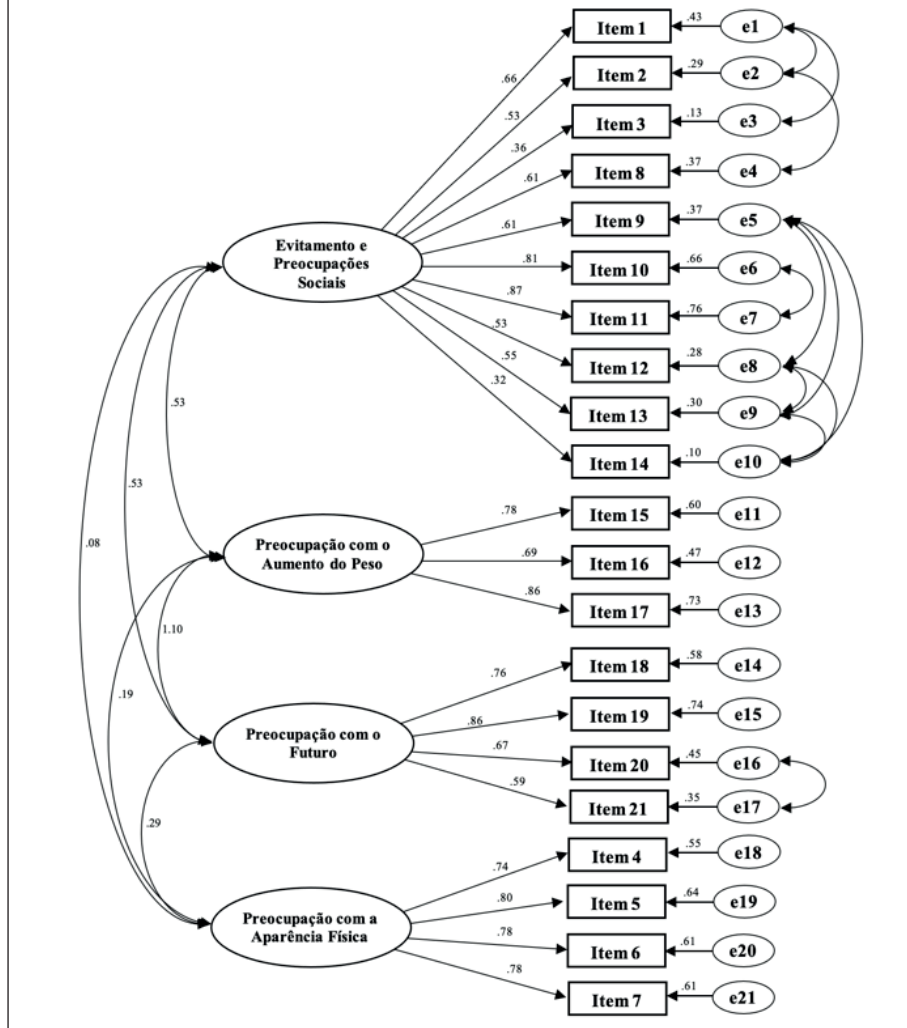
The model was refined using the covariance errors between items 1-2, 1-3, 2-4, 5-8, 5-9, 5-10, 6-7, 8-9, 8-10, and 16-17, resulting in a better fit. Composite reliability ($\widehat{CR}$) was used to estimate whether the internal consistency of the items are consistent manifestations of the latent factor. According to Marôco (2021a), $\widehat{CR} \geq 0.70$ indicates appropriate construct reliability. In this study, the 21-item scale had a $\widehat{CR} = 0.95$. The subdimensions of Avoidance and social concerns, Concerns with weight gain, Concerns with the future, and Concerns with physical appearance had respective $\widehat{CR}$ values of 0.84, 0.82, 0.82, and 0.86. Table 3 shows an analysis of the consistency of the original scale and the Portuguese version. The Portuguese scale, which consists of 21 items, demonstrates greater internal consistency than the original scale.

Table 3

Reliability - Cronbach's alpha between the original scale and the Portuguese version

Original version (23 items)	Cronbach's alpha	Portuguese version (21 items)	Cronbach's alpha
BICDPS	0.88	EPICDG	0.89
Avoidance and social concerns	0.879	Evitamento e preocupações sociais	0.84
Concerns about weight gain	0.794	Preocupação com o aumento do peso	0.82
Concerns about the future	0.691	Preocupação com o futuro	0.83
Concerns about physical appearance	0.767	Preocupação com a aparência física	0.86

Table 4 shows a strong negative and significant correlation between BAS-2, EPICDG, and the Concerns about the future subdimension. In addition, a moderate correlation was found between BAS-2 and the Avoidance and social concerns and Concerns about weight gain subdimensions, and a weak correlation with the Concerns about physical appearance subdimension.

Table 4

Correlations between BAS-2, EPICDG and their subscales

	1	2	2.1	2.2	2.3	2.4
1. BAS-2	_	-0.525***	-0.470***	-0.438***	-0.517***	-0.137*
2. EPICDG		_	0.805***	0.761***	0.860***	0.487***
2.1 Avoidance and social concerns			_	0.515***	0.605***	0.067
2.2 Concerns about weight gain				_	0.767***	0.166*
2.3 Concerns about the future					_	0.270***
2.4 Concerns about physical appearance						_

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 5 compares the total scores of BAS-2, EPICDG, and subdimensions according to the trimester of pregnancy. The results show no statistically significant differences between groups ($p < 0.05$).

Table 5

Comparison between the total scale and the subfactors of the EPICDG according to the trimester of pregnancy

	1st Trimester (n = 18) Mean ± SD	2nd Trimester (n = 94) Mean ± SD	3rd Trimester (n =119) Mean ± SD	p-value
1. BAS-2	43.06 ± 5.73	41.79 ± 8.18	41.49 ± 6.97	0.70
2. EPICDG	57.78 ± 13.06	52.50 ± 13.85	53.50 ± 13.99	0.37
2.1 Avoidance and social concerns	19.11 ± 6.31	16.64 ± 6.04	16.89 ± 5.94	0.28
2.2 Concerns about weight gain	7.44 ± 3.42	8.36 ± 3.55	8.45 ± 3.58	0.53
2.3 Concerns about the future	10.56 ± 4.72	9.64 ± 4.34	9.98 ± 4.29	0.67
2.4 Concerns about physical appearance	16.11 ± 3.38	13.48 ± 4.24	14.09 ± 4.28	0.05

Note. SD = Standard deviation; BAS-2 = Body Appreciation Scale-2; EPIDCG = *Escala de Preocupação com a Imagem Corporal Durante a Gravidez.*

Discussion

Adapting an instrument across cultures is a complex task that requires psychometric evidence of the new version of the instrument (Borsa et al., 2012). Among the procedures needed to assess data quality, factor analysis can be used to assess the covariance/correlation between a set of variables (Marôco, 2021b; Matos & Rodrigues, 2019). Exploratory and confirmatory factor analyses were conducted since the instrument was developed for a culture different from the Portuguese culture. The results indicate that the scale has good structural adequacy with values ranging from 0.8 to 0.9 (Marôco, 2021b) Matos and Rodrigues (2019) discuss the assumption that variables measuring the same factor should be highly correlated. The communalities of the variables were therefore analyzed. The authors argue that a minimum value of 0.5 is required for satisfactory communalities. The extraction method (principal component analysis) revealed very low communalities for item 3 (0.35) and item 15 (0.26). Despite the elimination of these items, the scale maintained an adequate structure. Communalities for the remaining 21 items were higher than 0.50 (Matos & Rodrigues, 2019).

The analysis of item-total correlations revealed higher minimum and maximum values than in the original scale ($r = 0.23$; $r = 0.64$; Uçar et al., 2018). The Portuguese version of the BICDPS consists of 21 statements organized into four dimensions. Marôco (2021a) argues that goodness-of-fit indices should be acceptable, with X^2/df if less than 5; SRMS < 0.08 indicating a good fit; GFI, CFI, and TLI between [0.9; 0.95] indicating a good

fit, and RMSEA]0.05; 0.08] indicating an acceptable fit. Based on this reference values and the existence of similar values between the second and third models, the model was respecified based on the highest covariances. Consequently, the fifth model had the best fit and was refined based on error covariance (Figure 1).

Marôco and Garcia-Marques (2006) argue that reliability is moderate to high with values between 0.8 - 0.9, so the scale has good levels of reliability. The analysis of correlations revealed moderate correlations between most of the variables. Correlations are considered weak if r (|r|) is less than 0.25, moderate if $0.25 \leq |r| < 0.5$, strong if $0.5 \leq |r| < 0.75$, and very strong if $|r| > 0.75$ (Marôco, 2021b, p. 23). Although there were no statistical differences between BAS-2, EPICDG, and subdimensions based on the trimester of pregnancy, it should be noted that participants had a positive perception of their body image during the first trimester of pregnancy, which decreased in the following trimesters. Women in their first trimester of pregnancy tend to be more concerned about their body image during pregnancy compared to later trimesters. These results are relevant to clinical practice. Silveira et al. (2015) found that satisfaction with body image during pregnancy (first, second, and third trimester) is a strong indicator of lower depression after childbirth.

Conclusion

This study found that the Portuguese version of the BICDPS has an acceptable psychometric structure for use in Portugal. Although the original version does not refer to testing different models, this study assessed a unidimensional, second-order, four-factor model to test the best model for the Portuguese culture. Despite the re-specification, the four-factor model had the best fit. The Portuguese version showed differences in item characteristics compared to the original version. However, both studies found no differences between groups according to the trimester of pregnancy.

Assessing women's body image during pregnancy can contribute to identifying and treating potential mental health issues related to body image. It can also help in understanding pregnant women's needs and providing better support throughout the pregnancy process. Adapting and validating the BICDPS for the Portuguese culture can be a valuable tool for health professionals to improve care for pregnant women.

This study had some limitations such as the non-representativeness of the sample, the lack of knowledge of specific medical conditions, and the control of response bias. Future studies should assess and compare results in different groups of pregnant women to better understand the topic, namely whether body image concerns during pregnancy influence women's decision to breastfeed their children.

Author contributions
Conceptualization: Mendes, J., Silva, S., Tavares, M.
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