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Validity of the Psychological Well-Being Scale with Morbid Female Obesity

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ABSTRACT – Psychological well-being is an important indicator of psychological adjustment. Obesity is considered a progressive disease that results in serious public health problems. This investigation sought validity evidence for the Psychological Well-Being Scale in 293 morbidly obese Brazilian women, aged between 18 and 61 years, who were awaiting bariatric surgery. The scores were submitted to Confirmatory Factor Analysis and several theoretical models were tested. According to the results, an oblique six-dimensional structure presented a good fit to the empirical data. Acceptable indices of internal consistency for the measurement factors were also obtained. The scale may contribute to the development of programs aimed at improving the psychological well-being of people with morbid obesity, before and after bariatric surgery.

KEYWORDS: Psychological well-being, morbid obesity, bariatric surgery, psychometry

Validade da Psychological Well-Being Scale com Obesidade Mórbida Feminina

RESUMO – O bem-estar psicológico é um importante indicador de ajustamento psicológico. A obesidade é considerada uma doença progressiva que resulta em sérios problemas de saúde pública. Esta pesquisa buscou evidências de validade para a *Psychological Well-Being Scale* com 293 mulheres brasileiras com obesidade mórbida, de 18 a 61 anos de idade, que aguardavam a cirurgia bariátrica. Os escores foram submetidos à Análise Fatorial Confirmatória e vários modelos teóricos foram testados. Nos resultados, uma estrutura de seis dimensões oblíquas apresentou um bom ajuste aos dados empíricos. Também foram obtidos índices aceitáveis de consistência interna para os fatores da medida. A escala poderá contribuir para programas que visem melhorar o bem-estar psicológico de pessoas com obesidade mórbida, antes e depois da cirurgia bariátrica.

PALAVRAS-CHAVE: bem-estar psicológico, obesidade mórbida, cirurgia bariátrica, psicometria

Obesity is a pandemic disease according to the World Health Organization ([WHO], 2018). There are predictions that in 2025 there will be 2.3 billion overweight adults and more than 700 million obese individuals (BMI above 30 kg/m^2) in the world. In Brazil, this chronic disease has increased by 67.8% in the last thirteen years, going from 11.8% of the population in 2006 to 19.8% in 2018 (*Associação Brasileira para o Estudo da Obesidade e da Síndrome Metabólica* [ABESO, Brazilian Association for the Study of Obesity and Metabolic Syndrome], 2018). It is a situation of concern, which requires attention from multidisciplinary teams as well as studies that address its consequences, both regarding the physical and emotional health, which can help preoperative preparation by encouraging patients' adherence to treatment and by enriching prognosis. This will attenuate complications in the postoperative period of bariatric surgery (Agra et al., 2017; Fagundes, Caregnato, & Silveira, 2016; Schakarowski, Padoin, Mottin, & de Castro, 2018).

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Obesity is considered a progressive disease that causes serious public health problems. It generates high economic costs for individual and social health, besides affecting the individual's longevity and psychological well-being (WHO, 2016). Obesity is generally classified by the Body Mass Index (BMI) and morbid obesity is defined by a BMI ≥40. There are different treatments for obesity such as diet, exercise, medication and behavioral therapy, but obese people can also be treated by surgery. Bariatric surgery is considered a successful method for treating severe obesity and has good effects on weight loss (Fagundes et al., 2016).

Most research works on obesity and mental health have focused on anxiety (Golian, Ghiyasvand, Mirmohammadali, & Mehran, 2014), depression (Richard, Rohrmann, Lohse, & Eichholzer, 2016), low self-confidence and/or eating disorders (Husky, Mazure, Ruffault, Flahault & Kovess-Masfety, 2017). Studies on Psychological Well-Being (PWB) in morbidly obese people are scarce (Yazdani et al., 2018). However, some psychosocial approach studies on obesity and PWB were found (Lo Coco, Salerno, Bruno, Caltabiano, & Ricciardelli, 2014); they highlight the relevance of the interpersonal relationships that obese individuals maintain. Positive interpersonal relationships can cause satisfaction and self-fulfillment, while negative relationships enhance the difficulties, the obstacles in life and the problems in social relationships (Pereira, Lopes, Marcela, Gonçalves, & Vasconcelos-Raposo, 2017).

Well-being conceptualized in the simplest manner is a positive state of mind, such as happiness or satisfaction. If a person states that he/she is happy or satisfied with his/her life, it is certain that he/she has high well-being. Two different views have been developed regarding well-being and its role in the psychological domains of cognition, emotion and motivation. The subjective perspective focuses on the hedonic aspect of well-being, which is the pursuit of happiness and a pleasant life. It involves global affective and quality of life assessments (Diener, Lucas, & Oishi, 2018).

The Psychological Well-Being (PWB) perspective focuses on the eudaimonic happiness which is the realization of human potential and a meaningful life. This involves the perception of progress in the face of life's challenges, such as pursuing meaningful goals, growing and developing as a person, and establishing quality bonds with others. The feeling of psychological well-being is determined by the interaction between opportunities and living conditions, just like the way people organize knowledge about themselves, about others and the way they respond to their personal and social demands (Leite, Ramires, Moura, Souto, & Marôco, 2019).

Ryff (1989) developed a very clear model that divides psychological well-being into six main types. Autonomy characterizes the self-determined and independent individual, able to resist social pressures to think and act in certain ways, that regulates behavior from the inside out; and, evaluates himself/ herself by personal standards. The Environmental Domain refers to the sense of domination and competence in managing the environment, in controlling a complex array of external activities, in the effective use of the surrounding opportunities, and, in the ability to choose or create contexts suited to personal needs and values. Personal Growth corresponds to the feeling of continuous development, the perception of self-growth and self-expansion, openness to new experiences, the perception of one's potential, improvement of behavior over time openness to changes that reflect more self-knowledge and effectiveness. Positive relationships mean warm, satisfying, and trusting relationships with others; concerns about the well-being of others; capacity for strong empathy, affection and intimacy; giving and taking of human relationships. Purpose in Life is having goals in life and a sense of direction, feeling that there is meaning to the present and past life, maintaining beliefs that give purpose to life, having goals and objectives to live. Self-acceptance comprises a positive attitude towards oneself; recognizing and accepting multiple aspects of self, including good and bad qualities, feeling positive about past life (Ryff, 2014).

In order to measure the PWB construct, Carol Ryff (1989) developed the Psychological Well-Being Scale (PWBS) with 120 items, half negative, distributed in six dimensions. Afterwards, Ryff and Essex (1992) defined an 84-item version (14 items per dimension) for PWBS with internal consistency ranging from 0.83 to 0.91. This version was tested in several countries and different samples, and its reliability and validity indicators were considered adequate. According to Dominguez-Lara and Navarro-Loli (2018), this PWB measure has been one of the most widely used in international research and adapted to over 30 different languages and cultures.

However, the history of these numerous studies about the psychometric properties of PWBS indicates that the results found since the development of the instrument, varied regarding the number of factors and items. It is also important to consider that in those studies there is a wide variation in the participants' profile and in the investigation's methods (Dominguez-Lara e Navarro-Loli, 2018).

Studies on PWBS have found heterogeneous and controversial results regarding the PWBS structure. For example: the 42-item Portuguese version (Freire, Sousa, Pereira, & Martins, 2019), 20-item Argentinean (Meier & Oros, 2019), 29-item Spanish (Checa &Espejo, 2018), 19-item Mexican (Dominguez -Lara et al., 2019), Spanish with 17 items (Freire, Ferradás, Núñez, & Valle, 2017), English and Thai with 18 items (Klainin-Yobas, 2020), Brazilian with 36 items (Machado et al., 2013), 24-item Dutch (Opree, Buijzen, & Van Reijmersdal, 2018), 42-item Finnish (Saajanaho et al. 2020) and 18-item Korean (Seo, Sun, & Cheah, 2019). In the results of these studies, the factor structure of PWBS has varied from one to eight factors, sometimes in first-order models and sometimes in second-order hierarchical models (Hsu, Hsu, & Lee, 2017; Saajanaho et al. 2020).

Meier and Oros (2019) analyzed the psychometric properties of the PWBS scores of 825 Argentinean adolescent students from Buenos Aires aged 14 to 16. The study used the 39 items version proposed by Dierendonck (2005) and adapted by Diaz et al. (2006). Exploratory Factor Analysis (EFA) extracted a solution from four factors: (1) Self-Acceptance, (2) Personal Growth and Purpose in Life, (3) Autonomy and (4) Positive Relationships with Others. The Confirmatory Factor Analysis (CFA) presented a satisfactory fit for this model. The surveyors concluded that the adapted PWBS with four factors and 20 items was appropriate to assess the population of Argentinean adolescents.

Hsu et al. (2017) evaluated PWBS using the exploratory structural equation modeling (ESEM) with 3,014 North Americans. The factorial structure of the instrument determined by ESEM consisted of six factors with small to moderate correlations with each other. A method effect associated with the wording of some problematic items was also found.

Checa and Espejo (2018) tested the scores of 402 professional and amateur competitive athletes using a 29-item Spanish version of PWBS. The best fits to the data found were the models with five and six factors and one factor associated with the negative items (method effect). Shariff and Sulaiman (2018), through Principal Component Analysis with Varimax rotation, obtained a three-factor solution for PBWS, Self-Acceptance, Environmental Domain and Autonomy. Participants were 209 officials from the Malaysian Prime Minister's Department.

In an 18-item version, with the scores of 169 Korean immigrant mothers in the United States, Seo et al. (2019) examined the factor structure of PWBS. The average age of participants was 36 years. CFA did not confirm the original structure of the scale. Some high correlations between factors were found, suggesting that they are not sufficiently distinct from each other and that their number could be reduced. An EFA was performed on the four highly correlated factors and three new factors were identified (life satisfaction, goal orientation and positive self-perceptions).

In the study by Saajanaho et al. (2020), Finnish elderly (75, 80, and 85 years old) responded to a 42-item PWBS. For EFA and CFA, the results did not support the six-factor model. The scale's reliability was modest and the factorial structure of the measure was inconsistent in the three age groups. Gao and McLellan (2018) examined the PWBS of 33 items in Chinese adolescents. CFA results revealed that the fit goodness of the six-factor model was not acceptable. High factorial correlations were identified between the factors.

In PWBS Brazilian version used with 313 university students, Machado et al. (2013), according to Ryff (1989), used the method of item-total/dimension correlation matrices. Thus, the authors found that 48 items out of the 84 original ones had weak correlations ($r < 0.50$) with the items of their dimensions. These items were excluded and PWBS was left with 36 items, six in each factor, which were analyzed by CFA. Three models were tested: one-dimensional, six orthogonal factors and six oblique factors. In the results, the best fit to the data was found for the theoretical model of six oblique factors. The researchers considered the measure valid and reliable and recommended further research to investigate its validity in different populations.

Ryff's original PWBS (1992) is a six-dimensional instrument theoretically derived from eudaimonic well-being. However, review of the different studies that tested the instrument revealed frequent variations in the results regarding the original theoretical model. The sources of these variant structures found could be due to the different data analysis techniques used, but also the different samples used in the studies. However, although the PWBS scores of numerous different samples were analyzed, no analysis was found with the responses of morbidly obese women, in Brazil or in any other country.

The present study tested PWBS in a sample of morbidly obese women in the preoperative phase of bariatric surgery in order to verify the psychometric properties of the measure and contribute to research and psychological intervention in the relationship between obesity and psychological well-being in this population.

METHOD

Participants

A total of 293 obese women awaiting bariatric surgery aged between 18 and 61 years (M = 36; SD = ± 8.67) participated in this study. Their mean Body Mass Index (BMI) was 42.3 (SD = ± 5.51). Most women were married (63.2%), almost one third of the women was single (31.1%) and a small percentage was divorced (6.8%). As for education, just over half of the women had completed higher education (54%) and 46% had completed high school (46%). The majority (90.6%) resided in the Southern and Southeastern regions of Brazil and the rest in the other regions. Patients who had been awaiting for bariatric surgery for a minimum of six months and who had already undergone multidisciplinary preoperative preparation were selected. Participants were recruited from obese groups in social networks (Facebook, WhatsApp) or by recommendation of bariatric surgeons, gastroenterologists and psychologists.

Instruments

Participants completed a questionnaire with age, height, weight, Body Mass Index (BMI), education, marital status, date of surgery, city and state. Then, PWBS (Ryff & Essex, 1992) was applied, adapted to the Brazilian reality by Machado et al., (2013), with 36 items distributed in the six dimensions: Positive Relationships with Others, Autonomy, Mastery on the Environment, Personal Growth, Purpose in Life and Self-Acceptance. Composite Reliability indices ranged from 0.70 to 0.84 and Cronbach's Alphas from 0.77 to 0.89 among the six PWBS factors (Machado et al., 2013). In this study, in order to answer the instrument, women used a four-point Likert-type scale, which ranged from (1) "Strongly Disagree" to (4) "Strongly Agree".

Data collection

This study was submitted and approved by the Research Ethics Committee of Universidade Salgado de Oliveira (UNIVERSO), Niteroi, RJ, Brazil, to which it is linked, under number 79911017.3.0000.5289. Data were obtained through contacts on social media, in organized groups of obese women awaiting bariatric surgery, forming groups in Facebook and WhatsApp throughout Brazil, between December 2017 and June 2018. The questionnaires were made available online through the Platform Google Forms. Participants were invited to answer the questionnaire that contained sociodemographic and PWBS questions. Before filling them out, participants were informed about the purpose and process of the survey, and were allowed to withdraw from it at any time, at no cost to both parties, assuring absolute confidentiality of the data that would be stored for the data analysis. After the explanations, participants filled out and registered their agreement in the Informed Consent Form.

Data analysis

Data were imported into SPSS 26 and the items scores with negative PWBS wording were inverted to assess in the same sense as the construct. Descriptive analyses were performed in order to verify the normality of data distribution. Then, a series of structural models for PWBS was tested using Confirmatory Factor Analysis (CFA), partially replicating the study by Machado et al. (2013). The Maximum Likelihood estimation method was used, which proved to be robust even in the presence of a non-normal data distribution (Marôco, 2021), in the Analysis of Moment Structures 26 software ([AMOS 26], Arbuckle, 2019). In order to assess the fit of the models, the following indices were considered:

Chi-square (χ^2), assessing the magnitude of the discrepancy between the population covariance matrix and the sample covariance matrix. The χ^2 is a conservative estimate of the model's fit when the sample size is > 200 (Byrne, 2016). As a result, the χ^2/gl ratio was used and results below 2-3 were considered good. Comparative Fit Index (CFI), with relative indices comparing the fit of the model evaluated with the baseline model, with values >0.90 indicating a good fit (Bentler, 1990). Tucker-Lewis Index (TLI) also called the Bentler-Bonett Nonnormed Fit Index (NNFI) is similar to CFI, however, it does not penalize the quality of the model's fit so much because of its complexity (Bentler & Bonett, 1980). NNFI values range from 0 to 1 and are generally less than CFI values. Root Mean Square Error of Approximation (RMSEA) measures the discrepancy through the degrees of freedom between the sample and the population estimates. Values <0.05 are considered very good (Hair, Babin, Anderson, & Black, 2018). And, at last, the Consistent Akaike Information Criterion (CAIC) which is an index based on the χ^2 statistic and penalizes the model according to its complexity. The best-fitted model will have the lowest values in this index (Arbuckle, 2019).

RESULTS

When examining the PWBS scores, a Mardia coefficient of 205.29 (normalized = 33.30) was found, which indicated their multivariate abnormality. The observation of the Mahalanobis distances indicated the presence of some multivariate outliers. After removing the five most severe outliers, the sample was reduced to 288 obese women and the Mardia coefficient to 138 (normalized 30.95).

Following the procedures of Machado et al. (2013), within the scope of Structural Equation Modeling, through Confirmatory Factor Analysis (CFA), three different PWBS models were tested. First, the one-dimensional PWBS model with 36 items was tested (Figure 1) and, subsequently, the orthogonal six-factor model, also with 36 items (Figure 2). According to the classification of Marôco (2021), both models did not show good fits, as it can be seen in Table1.

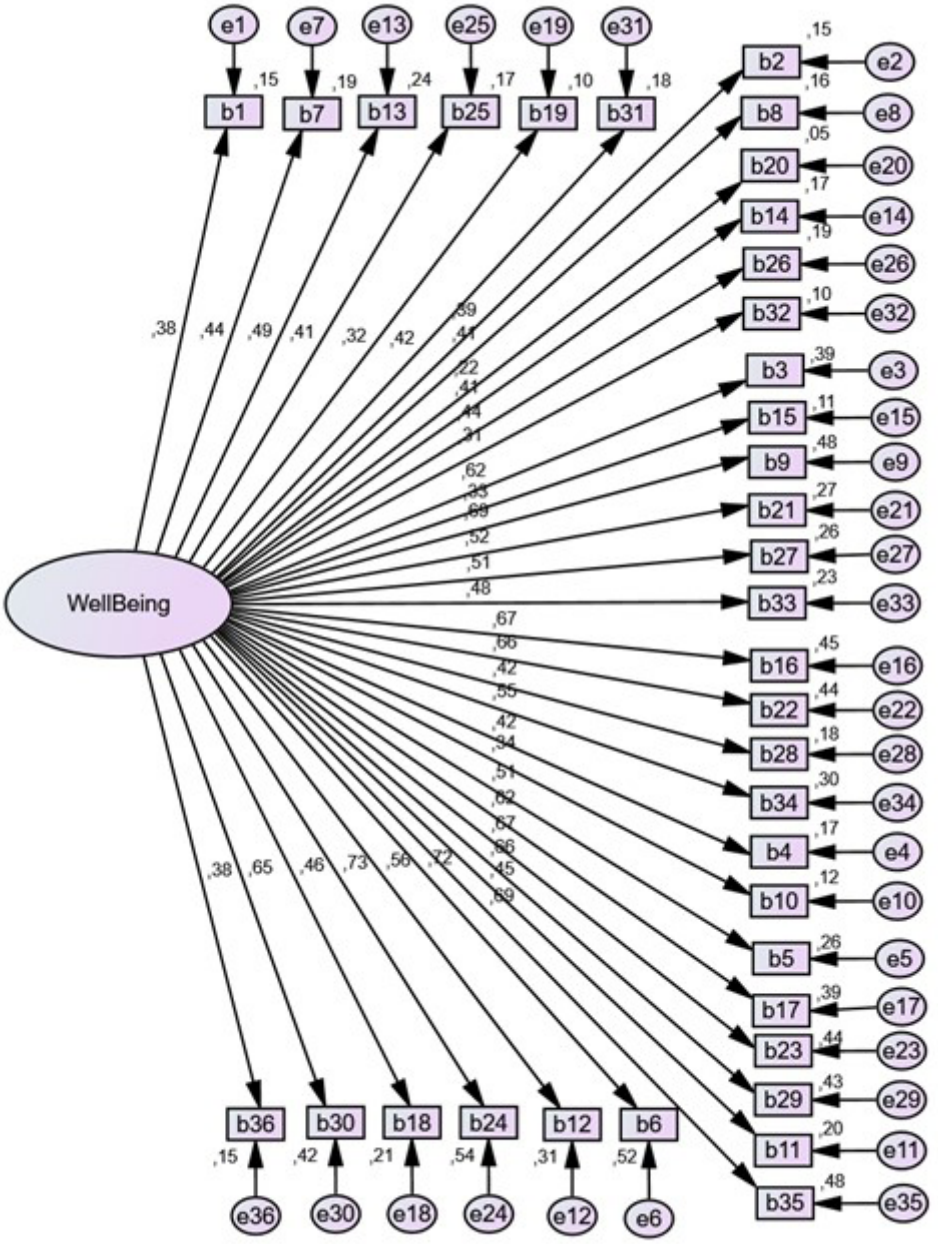

Figure 1. Diagram with factor weights (λ) for the observed variables of one-dimensional PBWS model.

The test of the PWBS model with six oblique factors and 36 items also presented an adjustment considered poor by Marôco (2021). See coefficients obtained in Table 1. According to Hair et al. (2018), items with factor weights < 0.50 are candidates for exclusion, given that less than 25% of their variability would be explained by the latent factor. For this reason, 10 items were excluded. Again, CFA was performed for the PWBS model with six oblique factors and 36 items. In addition, the observation of the Modification Indices suggested correlations between the errors of two pairs of items, which were affected by the insertion of two trajectories among them. At the end of these procedures, a respecified PWBS model with six oblique factors and 26 items, all with factor weights >0.50 (Figure 3) presented a good fit to the current empirical data (Table 1), according to the classification of Marôco (2021).

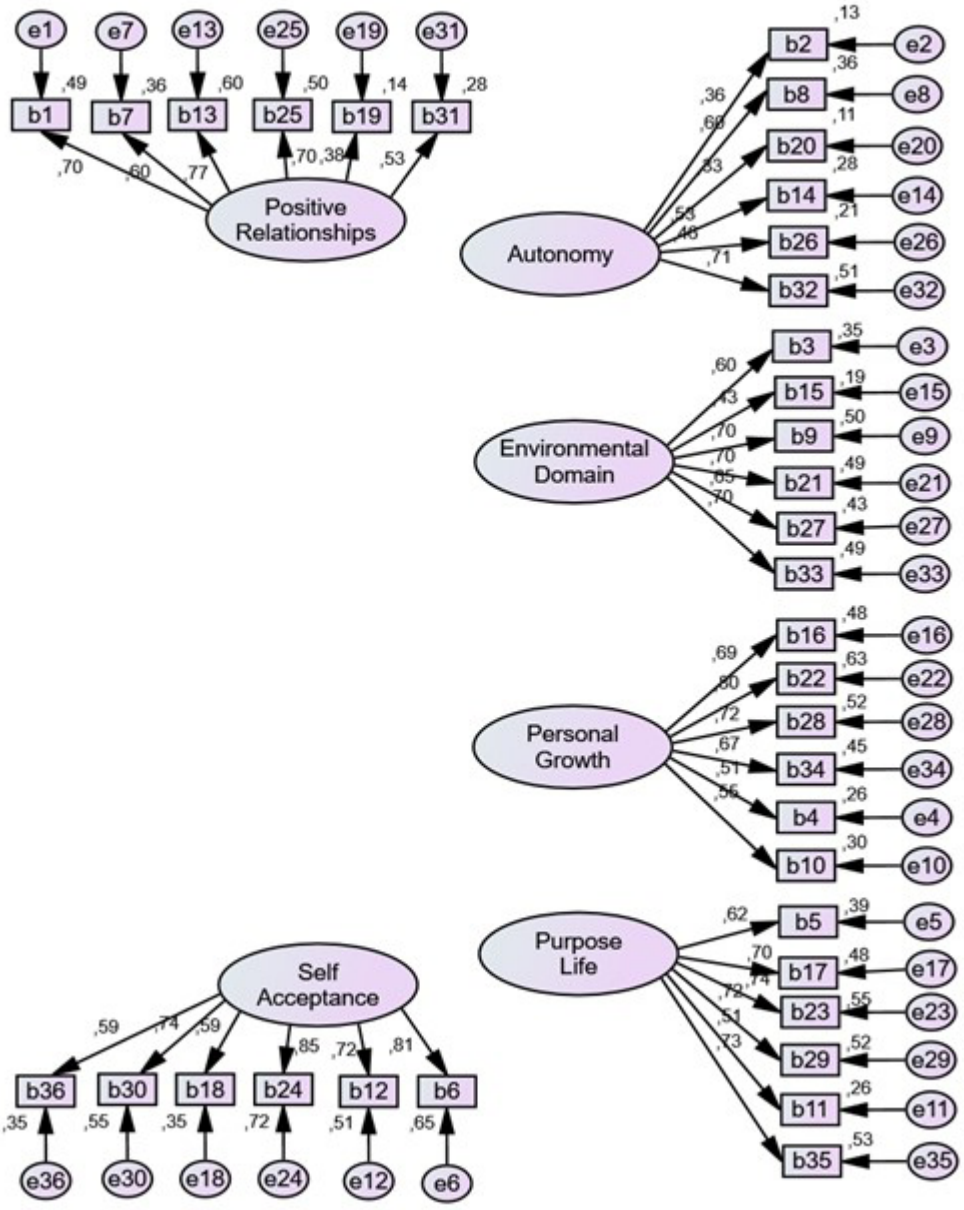

Figure 2. Diagram with factor weights (λ) for PBWS model with six orthogonal factors and the factor weights of the observed variables.

Table 1
Fit indices of tested models, previous and current, of PBWS

Study	Model	χ^2/gl	CFI	NNFI	RMSEA (LO-HI)90	CAIC
Machado et al. (2013)	1 F	3.22	0.92	0.92	0.084(0.080-0.089)	2092.83
	6 F orthogonal	3.74	0.90	0.90	0.094(0.090-0.98)	1782.16
	6 F obliques	2.36	0.95	0.95	0.066(0.061-0.071)	2537.80
Present	1 F	2.72	0.72	0.70	0.077(0.072-0.081)	2098.80
	6 F orthogonal	3.50	0.59	0.57	0.093(0.088-0.097)	2562.02
	6F obliques	2.04	0.83	0.82	0.060(0.055-0.065)	1761.23
	6 F obliques *	1.90	0.91	0.90	0.056(0.049-0.063)	996.20

*Note. F = factor(s). * respecified model.*

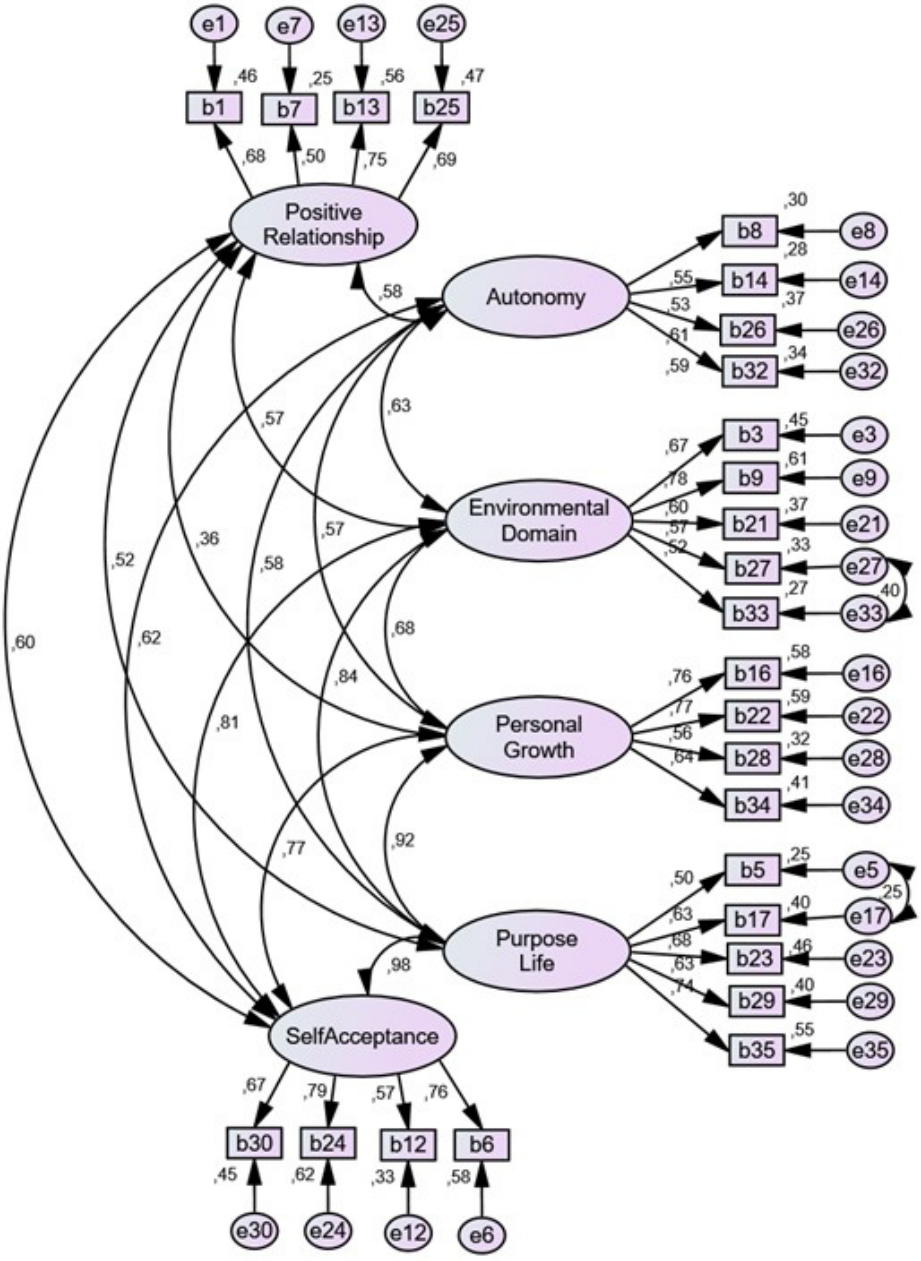

Figure 3. Diagram with factorial weights (λ) of the respecified PBWS model with six oblique factors.

Using statistics from the χ^2 of the oblique six-factor model with 36 items ($\chi^2$36) and the respecified six-factor oblique model with 26 items ($\chi^2$26) and their relevant degrees of freedom, the following statistical test was performed: $\Delta\chi^2 = \chi^2_{36} - \chi^2_{26} = 1181{,}596 - 536{,}458 = 645{,}138$, with $579 - 282 = 297$ degrees of freedom. In the Chi-Square Distribution table for $\alpha = 0{,}05$ there is a $\chi^2_{0.95(297)} \cong 340{,}000 < \Delta\chi^2 = 645{,}138$, evidencing that the respecified six-factor correlated model (Figure 3) fits better than the same 36-item model. CAIC is a criterion that uses parsimony in the assessment of the model and considers the number of estimated parameters and the sample size when comparing two models. The best fit is for the model with the lowest CAIC (Table 1).

From the items factor weights (λ), the Average Variance Extracted (AVEs) was calculated for each of the six factors of the respecified PWBS model. Convergent validity is represented by the total amount of item variances explained by latent factors, represented by AVEs. In the sample by Machado et al. (2013), the AVE of each factor ranged from 0.27 to 0.47. The calculated Composite Reliability (CR) is also an indicator of convergence and presented values for the six oblique factors that ranged from 0.84 to 0.66 (Table2).

Table 2
Square Matrices of Correlations between the Six Oblique Factors of the PBWS, their AVEs, their CCs and their Cronbach's Alphas

Study	Factor	1	2	3	4	5	6	CR	CA
Machado et al. (2013)	1 PR	**0.43**						0.82	-
	2 AU	0.18	**0.27**					0.70	-
	3 ED	0.24	0.42	**0.34**				0.76	-
	4 PG	0.38	0.29	0.26	**0.47**			0.84	-
	5 PL	0.26	0.25	0.41	0.58	**0.46**		0.83	-
	6 SA	0.40	0.46	0.45	0.52	0.55	**0.46**	0.83	-
Present	1 PR	**0.43**						0.75	0.74
	2 AU	0.16	**0.32**					0.66	0.66
	3 ED	0.21	0.18	**0.41**				0.77	0.79
	4 PG	0.08	0.15	0.21	**0.48**			0.78	0.79
	5 PL	0.16	0.17	0.38	0.50	**0.41**		0.78	0.79
	6 SA	0.24	0.22	0.37	0.36	0.56	**0.51**	0.84	0.79

Note. PR = Positive Relationships (1). AU = Autonomy (2). ED = Environmental Domain (3). PG = Personal Growth (4). PL = Purpose in Life (5). SA = Self-acceptance (6). Average variances explained (AVE) in bold. CR = Composite Reliability. CA = *Cronbach's Alpha*.

In Structural Equation Modeling - SEM, discriminant validity is defined by the non-presentation of considerable correlations between the constructs of the model. In the present study, these correlations ranged from weak, moderate to strong, all significant with $p< 0.01$. Discriminant validity was verified by the method of square comparison of correlations between the six PWBS factors with the AVEs of the factors. Therefore, in this study, AVE of each factor ranged from 0.32 to 0.51. Calculated Composite Reliability (CR) is also an indicator of convergence and presented values for the six oblique factors that ranged from 0.66 to 0.84 (Table 2). In all comparisons, AVE values were greater than the square of the correlations between factors, indicating discriminant validity (Hair et al., 2018; Marôco, 2021), except between the pairs of factors Purpose in Life -Personal Growth and Purpose in Life – Self-acceptance. Cronbach's alpha values of the six dimensions of PWBS for women with obesity ranged between 0.66 and 0.79 (Table2).

DISCUSSION

The present study investigated the validity evidences of the PWBS latent structure, as well as its convergent and discriminant validity indicators and reliability indexes in a Brazilian sample of morbidly obese women. Considering Marôco's (2021) criteria, the estimated indices for the respecified correlated six-factor model of PWBS Brazilian version revealed a good overall fit to the empirical data. As for the dimensionality of PWBS, current results were similar to those found in the original studies by Ryff (1989) and Machado et al. (2013), partially replicated in this research. However, in the current study, the number of PWBS items was reduced to 26. The comparison test ($\Delta\chi2$) with the $PWBS_{36\ oblique\ items}$ models and the respecified $PWBS_{26\ oblique\ items}$ models demonstrated the superiority of the latter's fit.

The trajectory inserted between the errors of items 27 ("I get frustrated when I try to plan my daily activities because I can never do the things I plan") – 33 ("I have difficulties organizing my life in a way that it is satisfactory for me") of the Environmental Mastery factor and 5 ("I believe I have goals and purposes in my life")– 17 ("I like to make plans for the future and work to make them a reality") of the Purpose in Life factor (Figure 3). The suggested correlation is possibly explained by the similarity of the pairs' content.

Since its creation, PWBS has been adapted and evaluated in numerous countries. However, as seen in the introduction to this study, the results are diverse, generating controversy as to the factor structure of the scale, although the six-factor model predominates in the findings. It is also important to consider that in these studies there is a wide variation in the profiles of the participants and the methods used in the investigation (Dominguez-Lara & Navarro-Loli, 2018) which makes it difficult to compare them.

According to Hair et al. (2018) and Marôco (2021), within the scope of SEM, the estimate of construct validity is made through three components: factor validity, convergent validity and discriminant validity. In the present study, all 26 items had factor weights > 0.50 that saturated on the factors for which they were originally assigned. Thus, it can be stated that there was evidence of factor validity for the

tested PWBS model. When the mean of the explained item variances (AVE) by the factor is > 0.50 (Hair et al., 2018), it is considered an indicator of convergent validity. In the current study, AVE values calculated for most factors did not indicate sufficient convergent validity (Table 2).

Discriminant validity indicates that the factors, although correlated, have a certain degree of independence. In this study, discriminant validity was verified by comparing the square of correlations between the factors and their AVEs (Marôco, 2021). The results of this research revealed validity for some factors. There was not enough discrimination between the Personal Growth and Purpose in Life factors and between Purpose in Life and Self-acceptance (Table 2). Therefore, the evidence of discriminant validity for the examined PWBS model was partially satisfactory. This result was similar to that found by Machado et al. (2013) with the scores of university participants.

Regarding reliability, the internal consistency indices of PWBS, Cronbach's Alpha and Composite Reliability factors were all adequate (≥0.70, Hair et al., 2018), except for the Autonomy factor, which was slightly lower than expected (Table 2).

In summary, the present study presented satisfactory results; the current results of PWBS psychometric properties verification with scores of obese women indicated evidence of a factorial structure of six oblique factors that confirm the original Ryff (1989) model and the Brazilian adaptation of Machado et al. (2013). On the other hand, there was a reduction in the number of items, which has already been observed in numerous previous studies (Chan, Chan, L-K, & Sun, 2019; Checa &Espejo, 2018; Dominguez-Lara et al., 2019; Freire et al.,2017; Klainin-Yobas, 2020; Kouali, Hall, & Pope, 2018; Lee, Sun, &Chiang, 2019; Meier & Oros, 2019; Opree et al., 2018; Pineda Roa, Castro Muñoz, & Chaparro Clavijo, 2017; Seo et al., 2019; Villarosa & Ganotice, 2018).

It should be noted, however, that the present study has some limitations considering the non-probabilistic sampling and the fact that it is composed exclusively of women, which did not allow performing measurement invariance studies. Caution is advised when extending these results to the general population. Therefore, these results will have to be considered within these limits.

It is suggested that future studies investigate the validity and reliability of PWBS in Brazilian samples of obese men and women, in different age groups and from different Brazilian regions. Thus, PWBS will be able to contribute to the monitoring of these patients, offering subsidies for the planning and implementation of initiatives and programs aimed at improving the psychological well-being of people with morbid obesity, both in the pre and postoperative period of bariatric surgery.

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