Original Article

Study of the measurement properties of the Portuguese Version of the Well-Being Questionnaire12 (W-BQ12) in women with pregnancy loss

Cândida Koch[1]

Célia Santos[2]

Margarida Reis Santos[2]

The assessment of well-being can be an important parameter in monitoring the process of mourning. In this study we sought to assess the applicability of the W-BQ12 – Well-Being Questionnaire - in a sample consisting of 74 women between four and six weeks following their respective pregnancy losses, analyzing its measurement capabilities. As proposed by the author, the analysis of the scale's primary components and the discriminating convergent validity confirmed the dimensional structure of three subscales. The scale showed good reliability (global Cronbach's Alpha coefficient = 0.84), and, overall, the items showed a good correlation with the corresponding subscale. Generally speaking, the W-BQ12 showed good discriminative validity when correlated with the PBGS - Perinatal Bereavement Grief Scale. This tool, applied to this study, was found to be both reliable and valid for use by nurses in assessing the well-being of women who have experienced this type of loss.

Descriptors: Miscarriage; Grief; Happiness.

[1] Doctoral Student, Universidade Católica Portuguesa, Portugal. Adjunct Professor, Escola Superior de Enfermagem do Porto, Portugal.

[2] PhD, Coordinating Professor, Escola Superior de Enfermagem do Porto, Portugal.

Corresponding Author:

Maria Cândida Morato Pires Koch
Escola Superior de Enfermagem do Porto
Rua António Bernardino de Almeida
CEP: 4200-072, Porto, Portugal
E-mail: candida@esenf.pt

Estudo das propriedades métricas da versão portuguesa para Portugal do Well-Being Questionnaire12 (W-BQ12) em mulheres com perda de gravidez

A avaliação do bem-estar pode constituir um dos parâmetros importantes na monitorização do processo de luto. Neste estudo, pretendeu-se avaliar a aplicabilidade do W-BQ12 – Questionário de Bem-estar – numa amostra de 74 mulheres, entre as quatro e as seis semanas pós-perda de gravidez, analisando as suas capacidades de mensuração. A análise de componentes principais e da validade convergente/discriminante dos itens permitiu confirmar a estrutura dimensional de três subescalas, propostas pela autora. A escala evidenciou boa fidelidade (coeficiente alpha de Cronbach global de 0,84). De forma global, os itens apresentaram boa correlação com a subescala correspondente. O W-BQ12 apresentou boa validade convergente quando correlacionado à PBGS – Escala de Avaliação do Luto Perinatal. Pode-se dizer que esse instrumento, neste estudo, mostrou ser medida fidedigna e válida, podendo ser utilizada pelos enfermeiros para avaliar o bem-estar em mulheres com esse tipo de perda.

Descritores: Aborto; Pesar; Felicidade.

Estudio de las propiedades de mensuración de la versión portuguesa del Cuestionario de Bienestar12 (W-BQ12) en mujeres con pérdida del embarazo.

La evaluación del bienestar puede ser un de los parámetros importantes en el monitoreo del proceso de luto. En este estudio se ha pretendido evaluar la aplicabilidad del W-BQ12 – Cuestionario de Bienestar – en una muestra constituida por 74 mujeres entre las cuatro y las seis semanas después de la pérdida del embarazo, analizando sus capacidades de mensuración. El análisis de componentes principales y la validad convergente discriminante de los ítems permitieron confirmar la estructura dimensional de tres subescalas, propuesta por la autora. La escala evidenció una buena fiabilidad (coeficiente Alpha de Cronbach global de 0,84). De manera global, los ítems presentaron una buena correlación con la subescala correspondiente. El W-BQ12 presentó una buena validad convergente cuando correlacionado con la PBGS – Escala de luto perinatal. Podemos decir que este instrumento, en este estudio, demostró ser una medida fidedigna y válida para ser utilizada por los enfermeros en la evaluación del bienestar en mujeres con este tipo de pérdida.

Descriptores: Aborto Espontáneo; Pesar; Felicidad.

Introduction

For a woman, involuntary pregnancy loss, besides involving psychological stress, can be an important factor in the development of a wide range of physical and emotional upheavals. This situation, as a negative event, deserves greater attention due to its impact, both potential and negative, on well-being. Rarely is it clear exactly what has been lost, given that the possible loss of self-esteem, loss of status (as a woman and potential mother) and existential loss is inherent to the loss of a pregnancy and a loved one, whether real or imaginary[1].

The bereavement process is complex and varies widely from individual to individual in its duration. However, desirable reactions are those which, although painful, guide the woman in the sense of accepting the loss and finding the strength to continue her life[2] with self-confidence and a feeling of security, contributing to positive affect and well-being, which can constitute an important parameter in the monitoring of resolution of mourning.

The literature recommends the use of reliable instruments, whose results may be compared internationally. Apart from their transcultural adaptation, it is crucial for these instruments' measurement properties to be validated in the different populations which will use them. With a view to achieving this, the authors intend

in this study to evaluate the measurement properties of an instrument for measuring well-being, which may constitute an important contribution to the evaluation of the process of mourning among these women.

Objective

To validate the measurement properties of the Portuguese version of the Well-Being Questionnaire12 (W-BQ12), in a sample of women who have experienced involuntary loss of a pregnancy.

Method

The W-BQ12 was validated by means of a set of procedures so as to evaluate its metric equivalence. This was undertaken by the analysis of its reliability and construct validity for the Portuguese population.

A scale's measurement validity is the guarantee that the test measures what it claims to measure[2]. The scale's validity as a construct was inspected by means of the factorial organization of its items, using Principal Component Analysis, following the procedures adopted by the authors. So as to confirm the organization of the scale in the study's sample, the authors analyzed the items' convergent and discriminant validity, by means of Pearson correlation between the items and the different subscales, with the item-subscale discrimination criteria defined as a correlation value greater than 0.10. The convergent validity "...refers to the extent to which the correlation of the instrument with instruments which measure the same construct is greater than with those which measure different constructs"[2]. It was in this context that the authors analyzed the Pearson correlation values between the scale under analysis and the Perinatal Bereavement Grief Scale (PBGS), filled out at the same time, so as to perceive the relationship between the theoretical constructs which they evaluated.

For the analysis of the scale's reliability, the internal consistency of each of the subscales and of the global scale was analyzed by the authors, considering Cronbach alpha values higher than 0.80 to indicate good internal consistency[3], although values above 0.60 would be acceptable in scales with a reduced number of items[2].

Instruments

The W-BQ was originally conceived, in 1982[4-5], as an instrument for measuring states of depression, anxiety and some aspects of positive well-being, and was applied in a World Health Organization (W.H.O) study for evaluating

new treatments for the management of diabetes. Although the initial version of 22 items continues to be recommended for studies in these areas, later, as a result of studies developed by the author and her collaborators[4-7] a reduced version of 12 items was brought out, derived from the initial scale but designed for measuring psychological well-being. More recently, a longer version has been produced, with 28 items, incorporating a subscale for stress which is specifically for individuals with diabetes (*ibidem*).

Although this instrument, in its different versions, was designed for studies on diabetics, its applicability is not restricted to this area. It has been translated into more than 35 languages[5], having been used for various kinds of studies in different cultures[5-8]. The Portuguese version was made available to the researchers by the author*, upon the establishment of a protocol.

The W-BQ12 takes the form of 12 statements, which people grade according to the frequency of their occurrence over a period understood as being between the fourth and sixth weeks after the loss of the pregnancy, using a Likert-type scale of four points, in which *0* corresponds to *never* and the value *3,* to *always*. It is composed of three subscales of four items each: one is intended to evaluate *negative well-being* (items 1 to 4), another is *energy* (items 5 to 8) and, lastly, one which evaluates *positive well-being* (items 9 to 12). The *energy* subscale is the only to present a mixture of items of a positive nature (items 5 and 8) and negative (items 6 and 7), implying a respective inversion of the two in the statistical procedures. Each subscale's score can vary between 0 and 12. The score for the total *well-being* scale is the sum of the 12 items (after inverting the scores for items 6 and 7) and can vary between 0 and 36. High scores indicate a high perception of well-being.

To evaluate the convergent validity of the W-BQ12, the authors used the Perinatal Bereavement Grief Scale (PBGS), developed for studies on perinatal mourning[9], translated, adapted and validated for the Portuguese population[10], and designed to evaluate mourning and anxiety, or feelings of missing the pregnancy or the baby which was lost. The scale is in the form of 15 statements and the idea is that participants respond about the frequency (not the intensity) with which they have occurred in the last week, using a Likert-type scale of four points, in which the value 1 corresponds to *rarely or never* (less than once a day), the value 2 corresponds to *sometimes* (one or two days), the value 3 to *many times* (3 to 4 days) and the value 4 to *all the time* or *almost all the time* (5 to 7 days). The PBGS score is a simple arithmetical sum of the individual scores of the items, and can vary between 15 and 60. A high score represents a

more intense manifestation of mourning, or, as it may be, mourning which has resolved less.

Participants

For psychometric validation of the Portuguese version of the W-BQ12 the authors used a convenience sample, made up of women who had gone through the experience of involuntarily losing a pregnancy, irrespective of the cause, up to the twenty-second week of pregnancy, who had a telephone, and who, in a free and informed way, accepted to participate in the study. Of the 135 women contacted, a sample of 74 was obtained. Although all of them had initially agreed to participate, some withdrew later, while others did not respond to various later attempts at contacting them.

The participants' average age was 31.82 (SD=6.01), with ages ranging from 17 to 44. Regarding marital status, 81.1% (n=60) were married, 14.9% (n=11) were living with a partner, and the others (4.1%, n=3) included single or separated women. The average gestational age at which the loss occurred was 10.65 weeks (SD=3.92). For 28.4% (n=21) of the women it was their first pregnancy. The average number of children was 0.5 (SD=0.74), although 54.1% (n=40) had no children. Regarding whether the pregnancy was planned, 75.7% (n=56) stated that it was. For 91.9% (n=68) of the interviewees this had been an accepted pregnancy, while for the others (8.1%, n=6) the pregnancy had either been not accepted in the beginning or never had been. Of the total of the participants, 64.9% (n=48) had experienced a spontaneous process of expulsion of the product of conception, while 35.1% (n=26) needed some type of surgical intervention.

Procedures

The necessary contacts with the author were established and a protocol was signed for use of the Portuguese version of the W-BQ12.

The present study took place in public hospitals in the north of Portugal after obtaining approval from the respective ethics committees and authorizations from service management, as well as from the Executive Boards.

The possible participants were contacted personally by the principal investigator, during the short period of hospitalization (average length, 24 hours) resulting from the loss of the pregnancy. This involved informing them about the objectives of the study and inviting them to participate, following all the informed consent procedures, in accordance with the Helsinki Declaration. The second contact was made between four and six weeks after the loss of the pregnancy, by means of a telephone interview, such that the researchers were able to evaluate the

woman's perception of her well-being at that moment by applying the Portuguese version of the W-BQ12.

The PASW program *Statistics 18* was used for statistical processing of the data.

Results

The structural dimensions, the validity and the reliability were assessed, with the aim of evaluating the instrument's metric equivalence in the populational sample of the present study.

Validity of the Construct

With a view to understanding how the contents of the items in the scale are conceptually organized, the researchers proceeded to an exploratory analysis of the principal components, obtaining four factors. Later, and with a view to bringing the scale closer to the original version, this was reduced to three, with only items with a factorial load equal to or superior to 0.30 being selected for analysis, in accordance with the literature[11].

The Varimax rotation method with Kaiser normalization was chosen so as to maximize the saturation of items. The factorial solution thus obtained explains 61.84% of the scale's total variance, with factor 1 (*Negative well-being*) best explaining the scale's variance (36.17%). The distribution of the items' factorial load can be observed in Table 1.

Table 1 – Analysis of the W-BQ12's Principal Components, with Varimax rotation and selection of items with a factorial load > 0.30, eigenvalues and specific values, variance and internal consistency of each factor

Items	Negative well-being	Energy	Postive well-being
1. I have episodes of crying or wanting to cry	0.77		
2. I feel down-hearted and sad	0.69		
3. I feel fear for no reason	0.80		
4. I become upset easily and panic	0.78		
5. I feel energetic, active, or full of vitality		0.75	
6. I feel without energy or weak	-0.34	0.79	
7. I feel tired, worn out or exhausted	-0.51	0.61	
8. I wake up feeling fresh and rested		0.67	0.34
9. I am happy, satisfied or content with my personal life			0.83
10. I have the type of life I wanted to have			0.67
11. I feel enthusiastic to get on with daily tasks or take new decisions		0.67	0.41
12. I feel I can easily deal with any serious problem or big change in my life			0.54
Eigenvalues and specific values	4.34	1.77	1.31
Total variance = 61.84	36.17	14.73	10.94
Internal consistency (*Cronbach's Alpha*) Total = 0.84	0.81	0.76	0.67

From analysis of the above table it may be concluded that the factorial structure of the W-BQ12 maintains a distribution identical to that envisioned by its author. Items 6 and 7 fit in the two subscales *negative well-being* and *energy*, however, the highest, and most positive, factorial weight is in the subscale to which they correspond (*energy*). The same happens with item 8, which fits in the *positive well-being* subscale, but with a higher factorial weight in the subscale to which it belongs in the original scale (*energy*). According to its factorial load, only one item (11- *I feel enthusiastic to get on with daily tasks and take new decisions*) leaves the subscale to which it belongs, *positive well-being*, to associate with items which constitute the *energy* subscale. All the items present a high factorial load (>0,50), with the exception of item 11, which, by presenting a factorial load in more than one factor, reveals a weight inferior to 0.50 in the factor to which it belongs.

Convergent-Discriminant Validity of the Items

With the intention of confirming the structure of the scale of the sample under study, the authors proceeded to the analysis of the items' convergent-discriminant validity, using the Pearson correlation between the items and the different subscales. The values obtained for each item are shown in Table 2.

Having as a criteria that the correlations of the items with the subscale to which they belong should

Table 2 – Convergent-discriminant validity of the items in the W-BQ12

Items	Negative well-being	Energy (items 6 and 7 recodified)	Positive well-being
1. I have episodes of crying or wanting to cry	0.56	-0.27*	-0.16
2. I feel down-hearted and sad	0.63	-0.48†	-0.34†
3. I feel fear for no reason	0.66	-0.24*	-0.19
4. I become upset easily and panic	0.69	-0.43†	-0.46†
5. I feel energetic, active, or full of vitality	-0.25*	0.55	0.46†
6. I feel without energy or weak	-0.38†	0.65	0.29*
7. I feel tired, worn out and exhausted	-0.49†	0.55	0.26*
8. I wake up feeling fresh and rested	-0.22	0.49	0.44†
9. I'm happy, satisfied or content with my personal life	-0.21	0.25*	0.48
10. I have the type of life I wanted to have	-0.20	0.26*	0.46
11. I feel enthusiastic to get on with daily tasks or take new decisions	-0.27*	0.56†	0.44
12. I feel I can easily deal with any serious problem or big change in my life	-0.36†	0.28*	0.42

Note: Values of *r* at the level of *p* <0.05* and *p* <0.01† for N = 74 are considered significant; the values of the correlation relative to each subscale were corrected for overlapping

be superior to 0.10 relative to their correlation with the remaining subscales and, analyzing the items which reveal themselves to be problematic in the analysis of principal components, it can be said that items 5, 7 and 8 do not present discriminative power among the subscales. Item 11 (*I feel enthusiastic to get on with daily tasks or take new decisions*), which was also problematic in the principal components analysis, maintains a greater correlation with the *energy* subscale, with a difference greater than 0.10 relative to the subscale to which it originally belonged – *positive well-being*. In this respect, and given that convergent-discriminant validity analysis of the items reinforces the results obtained by the principal components analysis, the authors considered the possibility of item 11 moving from the *positive well-being* subscale to the *energy* subscale. However, the authors also tried the possibility of associating the constructs in a more appropriate way, in two subscales, such that the principal components analysis was conducted again, reducing to two factors. The resulting factorial solution was not satisfactory, given that the items considered the most problematic remained as they were, and finally the authors decided to keep the three-dimensional structure of the W-BQ12, altering item 11 from the *positive well-being* subscale to the *energy* subscale.

Convergent Validity

So that it might be possible to evaluate the convergent validity of the constructs under evaluation in the different subscales of the W-BQ12, the authors calculated its correlation with the PBGS filled out simultaneously. Observation of Table 3 permits one to verify a negative correlation between the perception of *general well-being* and mourning, that is, the greater the perception of *general well-being*, the lesser the expression of mourning, that is, mourning is more resolved, corresponding to what is expected. Relative to the perception of *negative well-being*, one may observe a positive correlation with mourning. The correlation of perception of *energy* and *positive well-being* with mourning is not statistically significant.

As a result of the application of the instrument under analysis, and with the aim of understanding the perception

Table 3 – Convergent validity between the W-BQ12 and the PBGS

W-BQ12	PBGS
General well-being scale	-0.30*
Negative well-being subscale	0.36*
Energy subscale	-0.13
Positive well-being subscale	-0.22

Note: Values of *r* at the level of *p* < 0.01 (*) are considered significant

of well-being manifested by women after a situation of involuntary loss of pregnancy, the authors calculated the amplitude, average and standard deviation in the various dimensions proposed by the author, as well as the global scale (Table 4). The analysis of the results in the subscales permits the authors to state that in their sample, the perception of *positive well-being* appears with the highest value, followed by *energy* and, in last place, *negative well-being*. As for *general well-being*, there is a value which is between that of *positive well-being* and that of *energy*.

Table 4 – Distribution of amplitude, average and standard deviation of the subscales of the W-BQ12 and global scale (N=74)

Subscales and total scale	N.º of items	Amplitude	Average	Standard Deviation
Negative well-being	4	0-12	5.49	3.24
Energy	5	1-15	8.89	3.53
Positive well-being	3	2-9	6.27	1.75
General well-being	12	7-33	21.68	6.69

Reliability

It may be said that in regard to reliability, the results of the present study are similar to those of other studies conducted by the author[5,7], although the dimensions of the sample differ. The lowest Cronbach Alpha value was observed in the *positive well-being* subscale, which, according to some authors[3], means a weak internal consistency. The *energy* subscale presented a reasonable internal consistency, a fact which was also verified by the researchers in one of the author's studies, with a value even lower than in the present one[5], whereas in the *negative well-being* subscale and general well-being one may verify high values of internal consistency, which are closer to those of the studies of the author which the researchers referred to.

Table 5 presents the results of the analysis of the reliability of the different subscales and global scale, as well as the results obtained in two studies conducted by the author, one of which, a study carried out in a sample of diabetic patients[5], is here designated "a", and the other, carried out in a sample of adult individuals with deficiency in growth hormone[7], as "b".

The results obtained in the present study's sample are very close to those of study "a", although slightly below those obtained in study "b".

Discussion

Quality care implies new relationships between the carer and the person receiving care[12], leads to new care strategies and attempts to objectify the subjective, the

Table 5 – Reliability of the W-BQ12 in a sample in the study and in other studies carried out by the author

Subscales and total scale	Items and their internal consistency value (present study)	Cronbach's Alpha (present study) N=74	Cronbach's Alpha (study a) N=464	Cronbach's Alpha (study b) N=148
Negative well-being	Item 1=0.56	0.81	0.78	0.86
	Item 2=0.63			
	Item 3=0.66			
	Item 4=0.60			
Energy	Item 5=0.61	0.79	0.69	0.86
	Item 6=0.65			
	Item 7=0.53			
	Item 8=0.53			
	Item 11=0.56			
Positive well-being	Item 9=0.49	0.60	0.80	0.88
	Item 10=0.47			
	Item 12=0.29			
General well-being	12 Items	0.84	0.85	0.93

use of reliable and valid evaluation instruments being fundamental to this.

The authors intended with this study to analyze the metric properties of the W-BQ12 when applied to a sample of women in the situation of having involuntarily lost a pregnancy.

Maternity being an idea so intrinsically and culturally developed by women, it is understood that any event which jeopardizes it also interferes with their *well-being*, to the degree that it separates them from their aspirations, being able to negatively influence their reasoning about life and life satisfaction[13]. The authors studied, therefore, a sample of women who had gone through the experience of losing a pregnancy. It was decided to apply the instrument in the study, between the fourth and sixth weeks post-loss, because this is considered a period of recuperation and recovery[14], although this is difficult to define, being such an individual matter.

Regarding the conceptual structure of the scale applied to our sample, resulting from the three-factor exploratory analysis, there was some instability in the positioning of a few items, especially in the *energy* subscale. Specifically, items belonging to negative energy showed association with the *negative well-being* subscale, whereas items from positive energy showed association with the *positive well-being* subscale. This occurrence has been verified by other authors in various different studies as well[5,8]. This fact was confirmed in the study on the items' convergent-discriminant validity, as although some items presented a good correlation with the subscale to which they belonged, they also correlated with another subscale, representing a discriminant

validity inferior to 0.10. Because the problematic items remained the same after two-factor exploratory analysis, it was decided to keep the solution with three subscales, altering item 11, which is in line with the choice made by other authors[5,8].

It was concluded that the least robust subscale was that of *energy*, due to the conceptual structure of its items, which include characteristics which, in Portuguese culture, may be reflected in energy levels but also in well-being.

The difficulty in discriminating between some items of the *energy* subscale with *positive well-being* and *negative well-being* may be due to the fact that the same subscale presents one dimension of positive energy and another of negative energy and that the respondents, in the situation of the study, had some difficulty in disassociating the two concepts.

It is the *negative well-being* subscale which presents the best internal consistency; in contrast, the *positive well-being* subscale presents a weaker internal consistency[3], given that its value is between 0.60 and 0.70 in spite of being very close to the higher value, although values over 0.60 may be acceptable[2] and justifiable, above all if the scales have a reduced number of items. Despite the values verified in each subscale individually, the *general well-being* shows strong internal consistency.

The W-BQ12 presented consistent results when correlated with PBGS with the existence of two different, although inter-related, constructs (subjective *well-being* and mourning). A negative correlation was observed between *general well-being* and mourning; that is, the greater the perception of *well-being*, the lesser the expression of mourning, or, as it were, the more resolved mourning was. On the other hand, the *negative well-being* subscale presented a positive correlation with mourning; that is, it is associated with a stronger, less resolved sense of mourning.

The loss of a pregnancy, with all its implications, as a stressful event, can interfere with women's perception of their well-being. As the degree of the sadness diminishes, and the mourning is worked through, the level of well-being gradually becomes more positive.

Relative to the subscales *energy* and *positive well-being*, one may observe negative correlations with the degree of mourning, but these are not statistically significant.

The analysis of the present study's results permits one to conclude that the participants presented satisfactory levels of *positive well-being*, *general well-being*, and *energy*, compatible with a process of mourning which is in resolution, revealing satisfaction with their personal lives, and enthusiasm and confidence that they can continue along life's journey.

Conclusion

According to the results obtained, one can say that the Portuguese version of W-BQ12 proved itself a reliable and valid measure for evaluating well-being in women who have involuntarily lost a pregnancy, given the reasonable values for internal consistency of the subscales and of the global scale, as well as the structure resulting from the factorial analysis. It was shown that the questionnaire was sensitive for a population different from that in which it had previously been used, which is an indicator of its validity. Nevertheless it would be interesting to consider its applicability in a larger sample.

The use of such an instrument permits one to evaluate and identify with greater precision the women at risk of a prolonged or more complicated mourning process, after the involuntary loss of a pregnancy.

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