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The Satisfaction with Life Scale in Breast Cancer Patients: Psychometric Properties



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KEYWORDS

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Abstract

Background/Objective: This study aims to analyze the psychometric properties of the Satisfaction with Life Scale (SWLS), examining the reliability of scale scores and providing validity evidence for its use with breast cancer patients. We provide validity evidence based on internal structure and on relationships with positive psychological variables and other variables indicative of psychological adjustment. **Method:** Participants were 222 Spanish women with a diagnosis of breast cancer. They completed the SWLS and a battery of questionnaires measuring positive and negative affect, self-esteem, resilience, emotional intelligence, flourishing, optimism, depression, anxiety, and stress. **Results:** Confirmatory factor analysis supported a single-factor structure for the SWLS, $S-B \chi^2(5) = 7.36$, $p = .19$, CFI = .99, NNFI = .99, RMSEA = .046. The reliability of test scores estimated with McDonald's omega yielded a value of .80. Validity evidence was provided by a positive correlation between SWLS scores and positive affect, self-esteem, resilience, emotional intelligence (specifically, clarity and repair), flourishing, and optimism (range: .24, .69), and by a negative correlation with negative affect, pessimism, depression, anxiety, and stress (range: -.25, -.59). **Conclusions:** The Spanish version of the SWLS showed satisfactory psychometric properties and it is an appropriate measure for use in the breast cancer context.

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PALABRAS CLAVE

Psicología positiva;
Bienestar;
Florecimiento;
Optimismo;
Estudio instrumental

Escala de Satisfacción con la Vida en pacientes de cáncer de mama: propiedades psicométricas

Resumen

Antecedentes/Objetivo: El objetivo de estudio es examinar las propiedades psicométricas de la Escala de Satisfacción con la Vida (SWLS), analizando la fiabilidad de sus puntuaciones y aportando evidencias para su uso en pacientes con cáncer de mama. Se proporcionan evidencias de

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validez basadas en la estructura interna y en la relación con otras variables psicológicas positivas y con otras indicativas de ajuste psicológico. *Método:* Han participado 222 mujeres españolas diagnosticadas de cáncer de mama, que cumplimentaron la SWLS y medidas de afecto positivo y negativo, autoestima, resiliencia, inteligencia emocional, florecimiento, optimismo, depresión, ansiedad y estrés. *Resultados:* El análisis factorial confirmatorio indicó una estructura unidimensional, $S-B \chi^2(5) = 7,36$, $p = 0,19$, CFI = 0,99, NNFI = 0,99, RMSEA = 0,046. La fiabilidad de las puntuaciones estimadas con omega de McDonald fue de 0,80. Las evidencias de validez mostraron correlaciones positivas entre las puntuaciones de SWLS y afecto positivo, autoestima, inteligencia emocional (específicamente, claridad y reparación), florecimiento y optimismo (rango 0,24 - 0,69), así como correlaciones negativas con afecto negativo, pesimismo, depresión, ansiedad, y estrés (rango -0,25 - 0,59). *Conclusiones:* La versión española de la SWLS muestra adecuadas propiedades psicométricas, siendo una medida apropiada para utilizarla en pacientes de cáncer de mama.

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Breast cancer is one of the most common malignant tumors, accounting for 15.5% of cancer deaths in women (International Agency for Research on Cancer, 2021). Estimates for our country, Spain, suggest that there will be as many as 33,375 new cases of breast cancer in 2021 (Spanish Society of Medical Oncology, 2021). The diagnosis of breast cancer usually produces an emotional shock (Bellver-Pérez et al., 2019; Cardenal, Cerezo, Martínez, Ortiz-Tallo, & Blanca, 2012; Ochoa et al., 2017) that affects the woman's subjective well-being (Aizpurua-Perez & Perez-Tejada, 2020; Alarcón et al., 2020). Research conducted in the context of positive psychology and aimed at promoting well-being is increasingly focusing on the variables related to emotional adjustment in breast cancer (Cerezo et al., 2014, 2020).

Subjective well-being is defined by two components: affective and cognitive well-being. The affective component is conceptualized as an individual's emotional reactions to life events, including states of pleasure and displeasure, referred to as positive and negative affect, respectively (Pavot & Diener, 2004). The cognitive component is related to life satisfaction, which constitutes a value judgment and tells us something about the difference between a person's expectations and their actual achievements (Diener et al., 1999; Pavot & Diener, 2008). It is also described as the evaluation that an individual makes about the satisfaction with life as a whole (Diener et al., 2013).

Several instruments for measuring global life satisfaction have been reported in the literature (Maddux, 2018), including the Cantril Ladder (Cantril, 1965), the Riverside Life Satisfaction Scale (RLSS; Margolis et al., 2019), the Harmony in Life Scale (HILS; Kjell et al., 2016), and the Satisfaction with Life Scale (SWLS; Diener et al., 1985). Of these, the SWLS has been the most widely used and its psychometric properties have been extensively analyzed around the world (Emmerson et al., 2017), including in Asian (Bieda et al., 2017; Whisman & Judd, 2016; Yun, Rhee, Kang, & Sim, 2019), American and English (Whisman & Judd, 2016), Latin American (Bagherzadeh et al., 2018), African (Sovet et al., 2016), and European general populations (Bieda et al., 2017; Esnaola et al., 2017; Hinz et al., 2018; Jovanović, 2016). In Spain, studies of this kind have been conducted with early adolescents (Bendayan et al., 2013), adults

(Vázquez et al., 2013), and adults of advancing age (Sancho et al., 2020). The psychometric properties of the SWLS have also been studied with clinical samples, including in Parkinson's disease (Løvereide & Hagell, 2016), multiple sclerosis (Lucas-Carrasco et al., 2014), traumatic brain, spinal cord, or burn injury (Amtmann et al., 2019), psychiatric patients (Jovanović et al., 2020), and individuals with emotional disorders (Aishvarya et al., 2014). All of these studies found a single-factor structure and reported satisfactory reliability of scores (coefficients ranged from .80 to .92).

Validity evidence for the SWLS based on relationships with other variables has also been obtained by examining the association with different psychological constructs across several populations (clinical and non-clinical). Overall, SWLS scores have been found to correlate positively with scores on positive affect (Jovanović, 2016), self-esteem (Aishvarya et al., 2014), emotional intelligence (Sánchez-Álvarez, Extremera, & Fernández-Berrocal, 2015), and optimism (Hinz et al., 2018), and negatively with negative affect (Jovanović et al., 2020), pessimism (Hinz et al., 2018), depression, anxiety, and perceived stress (Jovanović, 2016; Jovanović et al., 2020; Nooripour et al., 2021).

Few studies to date have analyzed the psychometric properties of the SWLS in cancer patients. Lorenzo-Seva et al. (2019), with a sample of non-advanced cancer patients, found measurement invariance of the single-factor structure across sex, age, and tumor location. They also found that lower levels of SWLS scores were associated with higher levels of anxiety, depression, and somatization and lower of quality of life. More recently, Nooripour et al. (2021) also found a negative association between SWLS scores and anxiety, depression, and stress among Iranian breast cancer patients. However, to the best of our knowledge, these are the only studies focused on cancer patients, providing validity evidence based on a limited number of variables related to psychological symptoms. Other non-instrumental studies with breast cancer patients have found, in line with results in non-clinical populations, positive correlations between SWLS scores and self-esteem (Alarcón et al., 2020), resilience (Aizpurua-Perez & Perez-Tejada, 2020; Alarcón et al., 2020), and optimism (Cerezo et al., 2020). Given that the breast cancer diagnosis may affect well-being, further research is warranted to

extend knowledge about the psychometric properties of the SWLS in this population. Of particular interest in this respect is the analysis of the association between LS and other constructs from positive psychology, such as the propensity to experience positive emotions, the sense of personal value, the sense of having a purposeful life, and the ability to identify and manage one's own emotions and to emphasize the bright side of life. Instrumental studies focusing on the population with cancer are relevant not only for research but also for clinical practice (Alarcón et al., 2020; Calderon et al., 2020, 2021), insofar as they may provide adequate tools for diagnosis that in turn facilitate the design of specific psychotherapeutic interventions to help patients deal with the cancer experience (Ichikura et al., 2020; Rzeszutek et al., 2020).

The aim of this study was to analyze the psychometric properties of the SWLS, examining the reliability of scale scores and providing validity evidence for its use with breast cancer patients. Considering that the inferences drawn from instrument scores are for a given use, context, and population (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014; Kane, 2004; Muñiz & Fonseca-Pedrero, 2019), our specific goal was to provide evidence for the use of the SWLS total score as a global measure life satisfaction in a sample of Spanish women with breast cancer. This evidence would support the use of the SWLS in the assessment and prediction of psychological adjustment among women experiencing this kind of cancer. To this end, and in addition to examining the reliability of test scores, we first sought to obtain validity evidence based on internal structure, the assumption being that the scale provides a total score derived from a single-factor structure. This expected structure derives from the accumulated empirical evidence obtained in previous studies that have applied the SWLS in different populations and contexts. A further aim was to provide evidence based on relationships with other variables. Here we considered two sets of variables: the first comprised positive psychological variables, specifically positive and negative affect, self-esteem, resilience, emotional intelligence, flourishing, and optimism; the second included variables that have typically been studied and which are indicative of psychological adjustment, namely depression, anxiety, and stress. Based on previous evidence, we expected to find that SWLS scores were positively related to the first set of variables, and negatively related to the second set.

Method

Participants

The sample comprised 222 Spanish women with a diagnosis of breast cancer and ranging in age from 31 to 80 years ($M = 51.67$, $SD = 9.75$). The mean time since diagnosis was 3.87 years ($SD = 4.95$), with age at diagnosis ranging from 28.25 to 77.17 years ($M = 47.62$, $SD = 9.58$). Nearly half the sample (49.4%) was at stage II of the TNM tumor classification system. The sample was recruited through ASAMMA, an association in Malaga (Spain) for women with a breast cancer diagnosis. The inclusion criteria were as follows: having a diagnosis of breast cancer, no diagnosis of other cancers or

psychological disorder, and signing informed consent. The sample characteristics are shown in Table 1.

Instruments

Life satisfaction was evaluated with the Satisfaction with Life Scale (SWLS; Diener et al., 1985), in its Spanish version (Vázquez et al., 2013). Each of the five scale items is rated on a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*), and higher scores indicate higher life satisfaction.

Table 1 Sample characteristics (N = 222).

Variables	%
Age	
30-40	10.8
41-50	35.1
51-60	36.5
> 61	17.6
Marital status	
Single	17.1
Married	69.4
Divorced	8.6
Widowed	4.9
Educational level	
Primary	27.5
Secondary	41
University	31.5
Having children	
No	22.5
Yes	77.5
Breast cancer stage	
0	6.3
I	11.7
II	48.6
III	28.8
IV	4.6
Time since diagnosis (years)	
< 2	49.5
2-5	27.5
> 5	23
Age at diagnosis	
< 50	58.6
50 – 70	40.1
> 70	1.4
Affected breast	
Left	45.0
Right	48.2
Both	6.8
Breast surgery	
Yes	96.8
No	3.2
Type of breast surgery	
Conserving	39.8
Mastectomy	60.2
Treatment received	
Chemotherapy	81.5
Radiotherapy	69.4
Endocrine therapy	56.3
Monoclonal antibody	15.3

Cronbach's alpha coefficient in the Spanish version was .84. McDonald's omega in the present sample was .80.

Negative and Positive Affect Scale (NAPAS; [Mroczek & Kolarz, 1998](#)), in its Spanish version ([González-Herero & Extremera, 2010](#)). The NAPAS consists of 12 items distributed across two subscales, positive and negative affect, and each item is rated on a 5-point Likert-type scale (1 = *never*; 5 = *always*). Higher scores indicate higher levels of positive or negative affect. Cronbach's alpha coefficients of the positive and negative affect scales in the Spanish version were .86 and .78, respectively. McDonald's omegas for the two subscales in the present sample were .90 and .87, respectively.

Positive and Negative Affect Schedule (PANAS; [Watson et al., 1988](#)), in its Spanish version ([López-Gómez et al., 2015](#)). The PANAS comprises 20 items distributed across two subscales, positive and negative affect, and each item is rated on a 5-point Likert-type scale (1 = *very slightly or not at all*; 5 = *extremely*). Higher scores indicate higher levels of positive or negative affect. PANAS. Cronbach's alpha coefficient in the Spanish version was .92 for positive affect scale and .88 for negative affect scale. McDonald's omegas for the two subscales in the present sample were .71 and .76, respectively.

Emotional intelligence was evaluated with an abbreviated version of the Trait Meta-Mood Scale (TMMS; [Salovey et al., 1995](#)), in its Spanish version (TMMS-24; [Fernández-Berrocal et al., 2004](#)). This scale comprises 24 items rated on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*) and distributed across three dimensions (eight items each): Attention, Clarity, and Repair. Higher scores indicate greater emotional attention, clarity, and repair. Test-retest correlation in the Spanish version was .60 for attention, .70 for clarity, and .83 for repair, being the internal consistency above .85. McDonald's omegas in the present sample were .88, .88, and .91, respectively.

Resilience was assessed with a brief version of the Connor-Davidson Resilience Scale (CD-RISC 10; [Campbell-Sills & Stein, 2007](#)), specifically the Spanish version ([Notario-Pacheco et al., 2011](#)) that has been validated in breast cancer patients ([Alarcón et al., 2020](#)). This instrument comprises 10 self-report items, each rated on a 5-point Likert-type scale (0 = *not true at all*; 4 = *true nearly all the time*), and higher scores indicate greater resilience. Test-retest correlation in the Spanish version was .71 and Cronbach's alpha coefficient was .85. McDonald's omega in the present sample were both .85.

Self-Esteem was evaluated with the Self-Esteem Scale (SES; [Rosenberg, 1965](#)), in its Spanish version ([Atienza et al., 2000](#)). Each of the 10 scale items is rated on a 4-point Likert-type scale (1 = *strongly disagree*; 4 = *strongly agree*), and higher scores are indicative of higher self-esteem. Cronbach's alpha coefficient for women in the Spanish version was .86. McDonald's omega in the present sample were .86.

Optimism was assessed using the Life Orientation Test-Revised (LOT-R; [Scheier & Carver, 1994](#)), in its Spanish version ([Cano-García et al., 2015](#); [Otero, Luengo, Romero, Gómez, & Castro, 1998](#)). Each of the 10 scale items is rated on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*), and three scores are obtained: optimism, pessimism, and total. High total scores indicate high optimism (after first

reversing scores on the pessimism items). The Cronbach's alpha coefficient for total score in the Spanish version was .78. McDonald's omegas in the present sample were .68, .53 and .65, respectively.

Flourishing was evaluated with the Flourishing Scale (FS; [Diener et al., 2010](#)), in its Spanish version ([De la Fuente et al., 2017](#)). This scale comprises eight items, each rated on 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*), and higher scores indicate higher level of flourishing. Cronbach's alpha coefficient in the Spanish version was .81. McDonald's omega in the present sample was .82.

Depressive, anxiety, and stress were assessed with the Depressive, Anxiety, and Stress Scales (DASS-21; [Lovibond & Lovibond, 1995](#)), in their Spanish version ([Daza et al., 2002](#)). Each of the 21 scale items is rated on a 4-point Likert-type scale (1 = *did not apply to me at all*; 4 = *applied to me very much or most of the time*), and higher scores indicate a higher level of depression, anxiety, or stress. Cronbach's alpha coefficients in the Spanish version were .93 for depression, .86 for anxiety and .91 for stress. McDonald's omegas in the present sample were .87, .89 and .91, respectively.

Procedure

The study was approved by the Ethics Committee of the University of Malaga and conducted in accordance with the ethical standards of the Declaration of Helsinki. The sample was recruited following a convenience sampling strategy. All participants were volunteers and all those who were invited to participate agreed to do so. They were informed about the study objectives and procedures, with informed consent being signed prior to any data collection. Given the combined length of the questionnaires we were using to obtain validity evidence based on relationships with other variables, and with the aim of reducing fatigue among respondents, we randomly divided the sample into two groups (around 50%), each of which completed a different set of instruments, distributed as follows according to the number of items involved: Subsample 1 ($n = 104$) completed the SWLS, NAPAS, SES, CD-RISC10, and TMMS-24, while subsample 2 ($n = 118$) responded to the SWLS, PANAS, FS, LOT-R, and DASS-21. Participants completed the instruments as part of their first visit to the association for women with breast cancer. This initial visit involves an individual session (of around an hour) with a psychologist in which new members are informed about the work and functioning of the association. At the end of this session, they completed the questionnaires in the presence of the psychologist, who clarified any doubts as necessary. Women were randomly assigned to complete one of the two sets of instruments.

Data analysis

Validity based on the internal structure of the SWLS was tested through confirmatory factor analysis (CFA). In accordance with previous evidence, we began by testing a single-factor model using EQS 6.4. Specifically, we used the polychoric correlation matrix with maximum likelihood and robust estimation methods, and we computed the Satorra-Bentler chi-square statistic ($S-B \chi^2$) with the following goodness-of-fit indices: comparative fit index (CFI), non-normed fit index (NNFI), and the root mean square error of

Table 2 Descriptive statistics for items of the SWLS, the SWLS total score, and for the other variables considered in the study.

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
In most ways my life is close to my ideal (SWLS)	222	4.31	1.44	-0.59	-0.27
The conditions of my life are excellent (SWLS)	222	4.24	1.41	-0.44	-0.33
I am satisfied with my life (SWLS)	222	4.55	1.45	-0.51	-0.26
So far, I have gotten the important things I want in life (SWLS)	222	5.12	1.40	-1.01	0.72
If I could live my life over, I would change almost nothing (SWLS)	222	3.92	1.77	0.08	-1.09
Life satisfaction (SWLS total)	222	22.14	5.79	-0.43	0.16
Subsample 1					
Positive affect (NAPAS)	104	18.26	4.53	0.07	-0.31
Negative affect (NAPAS)	104	14.28	4.90	0.68	0.06
Self-esteem (SES)	100	30.58	5.31	-0.05	-0.75
Resilience (CD-RISC 10)	100	25.40	7.12	-0.68	0.44
Attention (TMMS-24)	103	26.33	6.97	0.01	-0.69
Clarity (TMMS-24)	103	26.17	6.78	0.07	-0.78
Repair (TMMS-24)	103	26.55	7.94	-0.11	-0.94
Subsample 2					
Flourishing (FS)	118	44.58	5.90	-0.79	0.57
Positive affect (PANAS)	117	27.98	5.68	0.02	0.66
Negative affect (PANAS)	117	25.88	6.66	0.31	-0.58
Optimism (LOT-R)	116	7.78	2.01	-0.12	-0.52
Pessimism LOT-R)	116	5.41	2.14	-0.19	-0.05
Optimism total (LOT-R)	116	14.37	3.32	0.39	-0.43
Depression (DASS-21)	114	5.63	4.67	0.93	0.62
Anxiety (DASS-21)	114	5.75	5.22	1.07	0.32
Stress (DASS-21)	114	8.02	5.53	0.47	-0.79

approximation (RMSEA). Values of the CFI and NNFI close to or above .95 were interpreted as a good fit (Hu & Bentler, 1999), while values of the RMSEA less than .08 were considered as indicating a reasonable fit (Browne & Cudeck, 1992), and those less than .06 as a good fit (Hu & Bentler, 1999).

We also computed corrected item-total correlation coefficients, considering values above .30 as satisfactory (De Vaus, 2002). The reliability of test scores was analyzed by computing McDonald's omega coefficient, considering values of .70 or higher as satisfactory (Viladrich et al., 2017).

Finally, we obtained validity evidence based on relationships with other variables by calculating Pearson correlation coefficients between SWLS scores and scores on affect, self-esteem, resilience, emotional intelligence, flourishing, optimism, depression, anxiety, and stress. Following Cohen's criterion, we considered coefficients of $|\leq .10|$ as small, of $|\leq .30|$ as moderate, and of $|\geq .50|$ or higher as strong correlations.

Results

Table 2 shows descriptive statistics for the items and the total score on the SWLS, as well as for the other variables considered in the study.

Validity evidence based on internal structure

Results from the CFA showed that all goodness-of-fit indices were adequate according to the aforementioned criteria, CFI = .99, NNFI = .99, RMSEA = .046 [.01, .11]. The S-B $\chi^2(5)$

was 7.36, $p = .19$, which, by being non-statistically significant, indicates fit between the hypothesized model and observed correlations. Estimations for the standardized parameters are shown in Table 3, and all values are statistically significant.

Corrected item-total correlation and reliability of SWLS scores

Table 3 also shows the corrected item-total correlations for each item of the SWLS. All correlations were higher than the cut-off of .30. The value of McDonald's omega coefficient was .80, indicating satisfactory reliability of SWLS scores.

Validity evidence based on the relationship with other variables

Five participants from each subsample had a missing value on some of the measures (CD-RISC 10, PANAS, LOT-R, DASS-21). However, Little's MCAR test was not statistically

Table 3 Standardized factor loadings for the single-factor model of the SWLS and corrected item-total correlation.

Item	Loading	Corrected item-total correlation
1	.72	.71
2	.65	.58
3	.82	.76
4	.60	.59
5	.55	.52

Note. $N = 222$.

Table 4 Correlations of SWLS scores with other variables.

Variables	<i>n</i>	Life satisfaction (SWLS)
Subsample 1		
Positive affect (NAPAS)	104	.62***
Negative affect (NAPAS)	104	-.59***
Self-esteem (SES)	100	.69***
Resilience (CD-RISC 10)	100	.50***
Attention (TMMS-24)	103	-.15
Clarity (TMMS-24)	103	.35***
Repair (TMMS-24)	103	.47***
Subsample 2		
Flourishing (FS)	118	.69***
Positive affect (PANAS)	117	.24**
Negative affect (PANAS)	117	-.13
Optimism (LOT-R)	116	.42***
Pessimism LOT-R)	116	-.25**
Optimism total (LOT-R)	116	.42***
Depression (DASS-21)	114	-.47***
Anxiety (DASS-21)	114	-.31**
Stress (DASS-21)	114	-.30**
Note:		
*** $p < .001$,		
** $p < .01$.		

significant, $\chi^2 (21) = 18.27$, $p = .63$ (subsample 1) and $\chi^2 (28) = 124.90$, $p = .63$ (subsample 2), indicating that missing values were completely at random. We therefore proceeded with the analysis using completed cases for each variable.

Table 4 shows correlations between the SWLS and the other measures used in the study, specifying the number of participants. SWLS scores showed strong positive correlations with scores on positive affect (NAPAS), self-esteem, flourishing, and repair, and moderate positive correlations with scores on positive affect (PANAS), optimism, and clarity. Scores on the SWLS also showed strong negative correlations with scores on negative affect (NAPAS) and depression, and moderate negative correlations with scores on pessimism, anxiety, and stress.

Discussion

The aim of this study was to analyze the psychometric properties of the SWLS, examining the reliability of test scores and providing validity evidence for the use of the SWLS total score as a global measure of life satisfaction in a sample of Spanish women with breast cancer. This evidence would support the use of the SWLS in the assessment and prediction of psychological adjustment among women experiencing this kind of cancer. To this end, we first examined its internal structure and the reliability of test scores, and then obtained validity evidence based on the relationship with positive psychological variables (affect, self-esteem, resilience, emotional intelligence, flourishing, and optimism) and variables indicative of psychological adjustment (depression, anxiety, and stress).

Regarding the internal structure of the SWLS, the results confirmed, as expected, the single-factor structure observed in previous studies with clinical and non-clinical populations (e.g., Amtmann et al., 2019; Emmerson et al., 2017), including with cancer patients (Lorenzo-Seva et al., 2019; Nooripour et al., 2021). The homogeneity indices for all items were satisfactory, as was the reliability of scores. Reliability estimated with McDonald's omega yielded a value of .80, slightly lower than that reported in previous studies with cancer patients (Lorenzo-Seva et al., 2019; Nooripour et al., 2021) and in the general population (Hinz et al., 2018; Vázquez et al., 2013; Yun, Rhee, Kang, & Sim, 2019), where coefficients were close to .90. However, our value is similar to the Cronbach's alpha obtained in a study involving a mixed clinical sample (Amtmann et al., 2019). Overall, the results confirm that the SWLS is a unidimensional measure of the LS construct, and that higher scores correspond to higher levels of this aspect of subjective well-being. These results support the use of the SWLS total score in Spanish women with a diagnosis of breast cancer.

The mean score on the SWLS found in the present study ($M = 22.14$) is lower than that reported in the Spanish general population ($M = 24.1$; Vázquez et al., 2013 and $M = 25.08$; Vázquez et al., 2015) and among patients with different types of cancer ($M = 27.1$; Lorenzo-Seva et al., 2019). However, it is similar to the mean score obtained in a study of women with breast cancer ($M = 21$; Cipora et al., 2018), and it falls within the range of scores reported by Cerezo et al. (2020), who found that LS depended on the psychological adjustment of these patients ($M = 19.84$ in the psychologically vulnerable group vs. $M = 23.81$ in the psychologically adjusted group). These results suggest that breast cancer patients may have a different evaluation of their satisfaction with life as a whole, compared with other cancer patients. It is important to remember here that breast cancer differs from other cancers in that it mainly affects women and has a specific impact on the external and visible part of their body. The fact that breast cancer patients show decreased LS in comparison with the general population suggests they should be offered psychological support based on the assessment of specific needs (Cerezo et al., 2020) so as to help them face the experience of breast cancer and to promote their subjective well-being.

Regarding validity evidence based on the associations with other variables, the results, in line with what was expected, showed that SWLS scores are strongly (coefficients of .50 or higher) and positively correlated with positive affect (NAPAS), self-esteem, resilience, and flourishing, and moderately and positively correlated with optimism. This is consistent with previous studies involving different populations (Aishvarya et al., 2014; Di Fabio, Palazzeschi, & Bucci, 2017; Diener et al., 2010; Hinz et al., 2018; Jovanović et al., 2020), as well as research with cancer patients (Alarcón et al., 2020; Jovanović, 2016). Scores on the SWLS were also positively correlated with clarity and repair, but not with attention. The relationship between LS and emotional intelligence has not been studied previously using the SWLS and the TMSS-24 in women with breast cancer, although our findings are in line with results from non-clinical samples (Sánchez-Álvarez, Extremera, & Fernández-Berrocá, 2015). Clarity refers to the perceived ability to

understand one's own feelings, while repair reflects beliefs about the ability to manage negative feelings and focus on positive ones. Higher scores on these dimensions of emotional intelligence are therefore indicative of a greater ability to manage emotions, hence the association with LS. By contrast, higher scores on attention, which refers to the extent to which an individual notices and reflects upon his or her feelings, have been linked to negative affect and rumination (Sánchez-Álvarez, Extremera, & Fernández-Berocal, 2015).

We also found that SWLS scores were negatively correlated with scores on negative affect (NAPAS), pessimism, depression, anxiety, and stress, which again is in line with what was expected and with previous studies involving different populations (Hinz et al., 2018; Jovanović, 2016; Jovanović et al., 2020; Lorenzo-Seva et al., 2019; Nooripour et al., 2021). It should be noted that in the present study the two affective components of well-being yielded a higher correlation with SWLS scores when measured with the NAPAS than with the PANAS. As to why this was the case, it is possible that the descriptive language used in the NAPAS reflects more clearly the emotional state of women who are dealing with the experience of breast cancer.

Overall, the findings support the potential use of the SWLS total score for the purposes of psychological diagnosis in women with breast cancer, insofar as it is a predictor of a set of variables which are indicative of psychological adjustment among individuals facing this type of cancer. The results suggest that women with a higher level of LS also score higher on other positive personality traits and positive subjective experiences. Specifically, these women show the propensity to experience positive emotions, expect good outcomes in life, emphasize the bright side of life and find purpose in it, and to identify and regulate their own emotions. They also have a more positive view of themselves, are more resilient in the face of adversity, and show better psychological adjustment overall, with lower levels of depression, anxiety, and stress. Conversely, women with a low level of LS also tend to experience fewer positive subjective experiences and higher levels of depression, anxiety, and stress, which may indicate psychological maladjustment and the need for psychological therapy to improve their well-being. Given that LS is positively associated with positive variables, psychological interventions may be complemented with strategies based on positive psychology, helping patients to flourish, to achieve an optimal affective and emotional state, and to cope more successfully with the disease process.

This study has a number of limitations. First, the sample was recruited using a convenience sampling strategy and all participants were voluntarily attending an association for women with a breast cancer diagnosis, which may limit the generalization of results. Further research should aim to include participants from other contexts such as hospitals or health centers, etc. Second, although LS is a subjective construct that is most appropriately measured through self-reports, this procedure may be affected by response bias (e.g., social desirability, order effect bias). Third, we have only studied certain psychometric properties of the instrument and further research is needed to provide more validity evidence. For example, it would be important to explore

factorial invariance and differential item functioning across different groups (e.g., in terms of age, breast cancer stage). These limitations notwithstanding, our study has two important strengths insofar as we add to knowledge about the use and interpretation of SWLS scores with breast cancer patients, providing more information about reliability and validity, and also extend knowledge about the relationship between LS and a number of positive variables, namely affect, self-esteem, resilience, emotional intelligence, flourishing, and optimism, an association that has scarcely been analyzed in instrumental studies. In addition, our study adds to existing evidence about the relationship between LS and variables inherent to psychological maladjustment such as depression, anxiety, and stress.

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