

Measurement Invariance and Validity of the Satisfaction With Life Scale in Informal Caregivers

F. Javier García-Castro¹, Rebecca Bendayan², and María J. Blanca¹

¹ University of Málaga and ² King's College London (London, U.K.)

Abstract

Background: The number of informal caregivers within ageing population is increasing and there is a growing research interest to promote their well-being, and therefore there is a need for adequate measurement tools. We aim to provide validity evidence of the Satisfaction with Life Scale (SWLS) in a representative sample of British older adults, including measurement invariance across caregivers and non-caregivers. **Method:** Data was drawn from English Longitudinal Study of Ageing (ELSA). The sample consisted of 3,754 caregivers and 4,036 non-caregivers. The structure and measurement invariance were tested through a confirmatory factor analysis. Reliability and validity evidence based on relationships with other variables were also analysed. **Results:** Our results supported the one-factor structure of the SWLS, CFI = .996; NNFI = .993; RMSEA = 0.081, and measurement invariance across caregiving status. McDonald's omega was .93. Scores on the SWLS were positively correlated with quality of life, positive social support, and self-reported health, and negatively with loneliness, depression, negative social support, difficulties in activities and instrumental activities of daily living, and number of health conditions. **Conclusions:** These findings provide new psychometric evidence to support the use of the SWLS in research which focuses on caregivers and on the comparison with non-caregiver samples.

Keywords: Caregiving, ageing, measurement invariance, satisfaction with life, Satisfaction with Life Scale.

Resumen

Invarianza Métrica y Validez de la Escala de Satisfacción Vital en Cuidadores Informales. Antecedentes: el número de cuidadores informales mayores está aumentando y existe un creciente interés en la investigación sobre su bienestar, para lo cual es necesario disponer de instrumentos adecuados de medida. Se pretende proporcionar evidencias de validez de la Escala de Satisfacción Vital (SWLS) en una muestra representativa de mayores de la población británica, incluyendo invarianza factorial entre cuidadores y no cuidadores. **Método:** los datos se extrajeron del English Longitudinal Study of Ageing (ELSA). Participaron 3.754 cuidadores y 4.036 no cuidadores. La estructura y la invarianza factorial se evaluaron mediante análisis factorial confirmatorio. También se analizaron la fiabilidad y la validez basada en la relación con otras variables. **Resultados:** los resultados apoyaron la estructura unifactorial del SWLS, CFI = .996; NNFI = .993; RMSEA = 0.081, y su invarianza factorial entre cuidadores y no cuidadores. El omega de McDonald fue .93. Se encontraron correlaciones positivas con calidad de vida, apoyo social positivo y salud percibida, y negativas con soledad, depresión, apoyo social negativo, dificultades en actividades y actividades instrumentales de la vida diaria y problemas de salud. **Conclusiones:** los hallazgos proporcionan nueva evidencia empírica que apoya el uso del SWLS en investigación centrada en cuidadores.

Palabras clave: cuidados, tercera edad, invarianza métrica, satisfacción vital, Escala de Satisfacción con la Vida.

Positive psychology is focused on the factors that encourage people and societies to flourish (Seligman & Csikszentmihalyi, 2000). Within this framework, there is a growing body of evidence related to subjective well-being (Pavot & Diener, 2008), which is considered a multidimensional construct with both an affective and cognitive component (Diener et al., 1985; Diener et al., 1999). Life satisfaction is the cognitive component of subjective well-being and can be defined as the individual's appraisal of the quality of their own life (Diener et al., 1985), including the perception that one is progressing towards one's goals in life (Diener et al., 1999). Research to date has provided evidence of the association between

life satisfaction and mental and physical health outcomes such as stress, depression, and pain, among others (Bendayan et al., 2013; Esnaola et al., 2019; Karadag-Arli et al., 2018; Lee et al., 2001).

Life satisfaction has been found to be associated with better health outcomes in older adults (Gana et al., 2013; Ngamaba et al., 2017). Within an ageing population, more people are providing non-paid care to their relatives and friends; it has been estimated that these informal caregivers numbered around 4.5 million people in the UK in 2018/2019 (Powell et al., 2020). There is a growing body of research into life satisfaction and caregiving (e.g., Borg & Hallberg, 2006; Chappell & Reid, 2002; De Oliveira & Hlebec, 2016; Fauziana et al., 2018; Haley et al., 2003). Life satisfaction in informal caregivers has been found to be positively associated with self-esteem (Chappell & Reid, 2002), social support (Borg & Hallberg, 2006; Chappell & Reid, 2002; De Oliveira & Hlebec, 2016; Khusaifan & El Keshky, 2017), social activity (De Oliveira & Hlebec, 2016; Haley et al., 2003), and health (Borg & Hallberg, 2006; De Oliveira & Hlebec, 2016; Haley et al., 2003; Lee et al.,

2001), and negatively associated with stress (Haley et al., 2003; Lee et al., 2001), caregiver burden (Chappell & Reid, 2002; Fauziana et al., 2018), and depression (Lee et al., 2001). Lower levels of life satisfaction have been found among caregivers who are unemployed (Borg & Hallberg, 2006; De Oliveira & Hlebec, 2016), unmarried (De Oliveira & Hlebec, 2016), have a lower educational level (De Oliveira & Hlebec, 2016; Haley et al., 2003), and those on lower incomes (Haley et al., 2003).

Life satisfaction is traditionally assessed using the Satisfaction with Life Scale (SWLS; Diener et al., 1985), consisting of five self-report items, each rated on a 7-point Likert-type scale. The SWLS is also one of the most commonly used instruments in research focusing on caregiver well-being (e.g., Athay, 2012; Fauziana et al., 2018; Khusaifan & El Keshky, 2017; Reizer & Hetsroni, 2015). The findings show that higher scores on the SWLS are associated with higher levels of positive aspects of caregiving, social support, subjective happiness, and self-rated health, and lower levels of caregiver burden and depression (Danacı & Koç, 2018; Fabà et al., 2017; Fauziana et al., 2018; García-Castro, Holgado-Tello et al., 2021; García-Castro et al., in press; Khusaifan & El Keshky, 2017; Lin et al., 2010; Reizer & Hetsroni, 2015; Waldron-Perrine et al., 2009).

Regarding the psychometric properties of the SWLS, several studies have examined its validity based on the internal structure, testing its factor structure across gender, age, countries, and cultures (Emerson et al., 2017; Whisman & Judd, 2016). The findings generally support a single-factor structure. In a review of its measurement invariance, Emerson et al. (2017) noted that there is also empirical evidence supporting the equivalence of SWLS scores for mean comparisons across gender, but not across age or cultural groups. However, several studies have found evidence of factorial invariance across countries and age groups (e.g., Checa et al., 2019; Esnaola et al., 2017; Esnaola et al., 2019; Jang et al., 2017; Jovanovic et al., 2020). Esnaola et al. (2017) reported measurement invariance by country, gender, and age when comparing 15-year-old Spanish and Mexican adolescents. Jang et al. (2017) similarly found configural and metric invariance of the SWLS across samples of company managers from 26 countries. Factorial invariance has also been tested across levels of education with Spanish adults (Checa et al., 2019), longitudinally across adolescence (Esnaola et al., 2019) and young adulthood (Wu et al., 2009), across a clinical psychiatric sample and non-clinical sample of the general population in Serbia (Jovanovic et al., 2020), and across middle-aged and older adults from the USA, England, and Japan (Whisman & Judd, 2016). Bacro et al. (2020), in a study of the French adaptation of the SWLS, provided further support for the single-factor structure and measurement invariance across age, gender, and time. However, none of these studies focused on caregivers, and those reports which have considered caregivers tend to involve convenience samples. For example, Athay (2012), in a sample of caregivers of clinically-referred youth, provided support for the single-factor structure of the SWLS through confirmatory factor analysis and reported relationships with other variables such as caregiver strain, externalizing symptom severity, and internalizing symptom severity.

There is growing research interest in the potential positive impact of caregiving on well-being in ageing populations (e.g., Bertrand et al., 2012; García-Castro, Bendayan et al., 2021; Rafnsson et al., 2017), underscoring the need to ensure the validity of the SWLS within this population and its suitability for comparisons between

caregivers and non-caregivers in future research. The overall goal of the present study was therefore to extend knowledge about the psychometric properties (Muñiz & Fonseca-Pedrero, 2019) of the SWLS for caregiving research in ageing populations. More specifically, we sought 1) to provide validity evidence based on the internal structure of the SWLS using data from a large population sample of English older adults and to explore its measurement invariance across caregivers and non-caregivers, and 2) to analyse the reliability of test scores and obtain validity evidence based on relationships with other relevant variables, namely quality of life, loneliness, depression, social support, and health indicators (i.e., self-reported health, difficulties in activities and instrumental activities of daily living, and number of chronic health conditions). We expected to find 1) support for a single-factor structure of the SWLS for the total sample, 2) measurement invariance across caregivers and non-caregivers, and 3) positive relationships between SWLS scores and scores on quality of life, self-reported health, and positive social support, and negative relationships with scores on loneliness, depression, negative social support, difficulties in activities and instrumental activities of daily living, and number of health conditions. To the best of our knowledge, this is the first study to analyse the psychometric properties of the SWLS in a large and representative sample of an ageing population including both caregivers and non-caregivers.

Method

Participants

Data were extracted from wave 7 of the English Longitudinal Study of Ageing (ELSA; Banks et al., 2019). The total sample ($N = 7790$) consisted of main respondents with available data for caregiving status and SWLS items. We divided this sample by caregiving status into caregivers ($n = 3754$) and non-caregivers ($n = 4036$). Informal caregivers were defined as those respondents who answered *yes* when asked (in ELSA wave 7) whether they had provided any informal care to anyone in the last month. This definition is consistent with that used in previous research (Rafnsson et al., 2017; Vlachantoni, 2010). Most caregivers had been caregiving for four or more years (57.86%). Although specific data on the care recipient was limited, 212 caregivers (5.65%) provided care to their parents or parents-in-law, 247 (6.58%) to their children or grandchildren, 295 (7.86%) to their partner or spouse, and 171 (4.56%) to others; 136 respondents (3.62%) had provided care to two or more people during the last week.

Instruments

Life satisfaction. This was measured in ELSA using the Satisfaction with Life Scale (SWLS; Diener et al., 1985), which provides a global measure of life satisfaction. Life satisfaction is considered one of the cognitive components of subjective well-being (Diener et al., 1999) and it reflects a person's appraisal of his or her life. The SWLS consists of five self-report items, each rated on a 7-point Likert-type scale (1 = strongly disagree; 7 = strongly agree). Total scores range from 5 to 35, and higher scores indicate a higher level of life satisfaction.

Quality of life. This was assessed with the CASP-19 (Hyde et al., 2003), a summative scale of 19 items distributed across four domains: Control, Autonomy, Self-realization, and Pleasure

(hence, CASP). Each item is scored on a 4-point Likert-type scale (from 0 to 3). The total score ranges from 0 to 57, and higher scores indicate greater quality of life. Cronbach’s alpha coefficient for the total score in the present sample was .89, while alphas for the four subscales ranged from .55 to .84.

Loneliness. This was evaluated in ELSA using the Three-Item Loneliness Scale (Hughes et al., 2004), which was derived from the 20-item revised University of California Loneliness Scale (UCLA Loneliness Scale; Russell, 1996). The three-item version includes questions about feeling a lack of companionship, feeling left out, and feeling isolated from others. Each item is scored on a 3-point Likert-type scale (1 = hardly ever or never, 2 = some of the time, 3 = often), and the total score is calculated by summing scores for all three items. The total score therefore ranges from 3 to 9, and higher scores indicate higher levels of loneliness. Cronbach’s alpha coefficient for total scores in the present sample was .83.

Depression. This was assessed with the 8-item Center for Epidemiologic Studies Depression Scale (CES-D-8; Radloff,

1977; Turvey et al., 1999), which explores depressive symptoms experienced during the last week. Items (i.e., felt depressed, felt everything was an effort, slept restlessly, were happy, felt lonely, enjoyed life, felt sad, and could not get going) are answered using a dichotomous yes/no response (scored 0 = no, 1 = yes); the two positive items (‘were happy’ and ‘enjoyed life’) are reverse scored (0 = yes, 1 = no). The total score therefore ranges from 0 to 8, and respondents with higher scores are considered to show more depressive symptoms. Cronbach’s alpha coefficient for total scores in the present sample was .79.

Social support. Social support was measured in ELSA through questions referring to four relationship types (spouse/partner, children, friends, and extended family members) and two types of social support (positive and negative). Positive social support is that which is helpful for the individual, whereas negative social support is unwanted or a potential source of stress (e.g., Croezen et al., 2010; Lee et al., 2019). The questions for positive social support were: 1) how much they understand the way you feel about things;

Table 1
Sociodemographic characteristics of the sample

Sociodemographic variables	Percentage, or mean (M) and standard deviation (SD)			χ^2 / t
	Total sample (N = 7790)	Caregivers (N = 3754)	Non-caregivers (N = 4036)	
Gender				
Female	55.47%	66.20%	54.51%	336.73***
Male	44.53%	33.80%	45.49%	
Age	M = 66.88 SD = 9.58	M = 66.02 SD = 9.00	M = 67.67 SD = 10.02	7.67***
Level of education				
Less than secondary	22.17%	20.64%	23.59%	14.34**
Upper secondary and vocational training	40.42%	41.64%	39.30%	
Tertiary	14.66%	15.48%	13.90%	
Not stated	22.75%	22.24%	23.21%	
Employment status				
Unemployed/retired	41.03%	43.58%	38.65%	963.97***
Employed	31.40%	43.87%	19.80%	
Not stated	27.57%	12.55%	41.55%	
Marital status				
Single/divorced/widowed	22.94%	26.88%	19.28%	823.92***
Married/civil partnership	49.82%	60.87%	39.54%	
Not stated	27.24%	12.25%	41.18%	
Ethnicity				7.48*
White	94.76%	94.22%	95.27%	
Non-white	5.03%	5.46%	4.63%	
Not stated	0.21%	0.32%	0.10%	
Having children				28.79***
No	14.29%	12.09%	16.33%	
Yes	85.20%	87.43%	83.13%	
Not stated	0.51%	0.48%	0.54%	
Psychiatric problems				0.01
No	88.23%	88.28%	88.18%	
Yes	11.77%	11.72%	11.82%	
Total family wealth	M = 400309.26 SD = 904654.70	M = 407403.16 SD = 1061296.81	M = 390424.77 SD = 624049.02	7.67***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

2) how much they can be relied on if you have a serious problem; and 3) how much you can open up to them to talk about worries. The questions for negative social support were: 1) how much they criticize you; 2) how much they let you down when you are counting on them; and 3) how much they get on your nerves. Each question is rated using a 4-point Likert-type scale (0 = not at all, 1 = a little, 2 = some, 3 = a lot). Following Liao and Scholes (2017), we summed scores for each relationship type (range, 0-9) and then summed these to obtain total scores for positive and negative social support (range, 0-36 for each type of support). Cronbach's alpha coefficients for scores in the present sample were .81 for positive social support and .79 for negative social support.

Health status. Here we included both a subjective and objective measure of health. *Self-rated health* was measured in ELSA by an item that asked respondents to rate their health as poor, fair, good, very good, or excellent (from 1 = poor, to 5 = excellent). Data were also collected about the *number of health conditions*, with respondents having to indicate (yes/no) whether they had the following health conditions: high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, arthritis, asthma, high cholesterol, cataracts, Parkinson's disease, hip fracture, memory problems, Alzheimer's disease, and dementia. Responses were scored as 0 = no, 1 = yes, and hence the number of health conditions ranged from 0 to 16.

Disability. Two well-known indicators of disability were considered. *Difficulties in activities of daily living* (ADL) were assessed with the ADL index (Katz et al., 1963), which refers to six activities: dressing, walking across a room, bathing or showering, eating, getting in or out the bed, and using the toilet, each coded as 0 = no difficulties, 1 = difficulties. The total score for ADL therefore ranged from 0 to 6, with higher scores indicating more difficulties in activities of daily living. Cronbach's alpha coefficient for ADL scores in the present sample was .75. ELSA also considered *Difficulties in instrumental activities of daily living* (IADL), exploring seven activities based on those described by Lawton and Brody (1969): using a map to get around in a strange place, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden, and managing money, each of which was coded as 0 = no difficulties, 1 = difficulties. The total score for IADL thus ranged from 0 to 7, with higher scores indicating more difficulties in instrumental activities of daily living. Cronbach's alpha coefficient for IADL scores in the present sample was .71.

Procedure

ELSA (Banks et al., 2019) is a biannual, longitudinal, and nationally representative survey of English older adults. More details can be found at <https://www.elsa-project.ac.uk/>. ELSA has received ethical approval from the South Central – Berkshire Research Ethics Committee (21/SC/0030, 22nd March 2021).

Data Analysis

The internal structure of the SWLS was tested through confirmatory factor analysis (CFA). We first tested a single-factor model in which each of the five items loaded on one latent factor for the total sample. Then, in order to analyse measurement invariance, we divided the sample by caregiving status into caregivers and non-caregivers and tested the configural and metric invariance for

the single-factor model across these groups. The model was tested by constraining the factor structure to be equal across caregiving status, and by constraining the factor loadings to be equal.

The CFA was conducted using EQS 6.4 (Bentler, 2006) and was based on the polychoric correlation matrix with maximum likelihood and robust estimation methods. Model fit was examined by computing the Satorra-Bentler chi-square statistic (χ^2_{S-B}) and the following fit indices: the comparative fit index (CFI; Bentler, 1990), the non-normed fit index (NNFI; Bentler & Bonett, 1980), and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993; Steiger, 2000). Values of the CFI and NNFI close to or above .95 indicate good fit (Hu & Bentler, 1999), while for the RMSEA, values less than or equal to .08 indicate reasonable fit (Browne & Cudeck, 1993) and those below .06 a good fit (Hu & Bentler, 1999). For categorical data, it has also been proposed that values of .95 for the CFI, of .96 for the NNFI, and less than .05 for the RMSEA indicate good model fit (Schreiber, 2017). Finally, we tested the configural and metric invariance by comparing the CFI values of the models. The constrained model may be considered tenable when the decrease in CFI is less than or equal to .01 in relation to the configural model (Byrne, 2008; Byrne & Stewart, 2006; Cheung & Rensvold, 2002).

To analyse the item properties, we computed item-total correlation coefficients, eliminating the score of the respective items. Values above .30 were considered satisfactory (De Vaus, 2002). Reliability of item scores was examined by computing McDonald's omega coefficient, considering values of .70 or higher as acceptable (Viladrich et al., 2017).

Finally, and to obtain validity evidence based on relationships with other variables, we calculated Pearson correlation coefficients between SWLS scores and scores for quality of life, loneliness, depression, positive social support, negative social support, self-reported health, ADL, IADL, and the number of health conditions. Coefficients around 1.10|, 1.30|, and 1.50| were interpreted as indicating small, moderate, and strong correlations, respectively (Cohen, 1998).

Results

Descriptive Statistics

Table 2 shows descriptive statistics for SWLS total and item scores for the total sample, caregivers, and non-caregivers. Most of the skewness and kurtosis coefficients indicate deviation from the normal distribution, which justifies the use of the maximum likelihood and robust estimation methods for the CFA.

Validity Evidence Based on the Internal Structure

A CFA was conducted with the total sample in order to examine the fit of the single-factor structure. The CFI and NNFI indicated a good fit, with values above .95, while the RMSEA suggested a reasonable fit, with a value close to .08. We then examined the fit of the single-factor model for caregivers and non-caregivers separately. Both these models yielded adequate fit values. The indices related to the test for configural and metric invariance also suggested a good fit, insofar as there was no decrement in the CFI from the configural model to the model with the factor loadings constrained. Table 3 shows the fit indices for the factor invariance across caregiving status. Standardized parameter estimates for the

Table 2
Means (M), standard deviations (SD), skewness (S), and kurtosis (K) for the total sample, caregivers, and non-caregivers

SWLS items	Total sample (N = 7790)				Caregivers (n = 3754)				Non-caregivers (n = 4036)			
	M	SD	S	K	M	SD	S	K	M	SD	S	K
In most ways my life is close to my ideal	5.09	1.46	-1.04	0.39	5.12	1.43	-1.05	0.42	5.06	1.48	-1.02	0.36
The conditions of my life are excellent	5.06	1.49	-0.94	0.15	5.12	1.47	-0.97	0.24	5.02	1.52	-0.91	0.06
I am satisfied with my life	5.41	1.38	-1.30	1.24	5.45	1.35	-1.33	1.35	5.37	1.40	-1.27	1.13
So far, I have gotten the important things I want in life	5.57	1.31	-1.43	1.89	5.62	1.29	-1.49	2.16	5.52	1.32	-1.38	1.67
If I could live my life over, I would change almost nothing	4.68	1.72	-0.57	-0.79	4.72	1.71	-0.58	-0.75	4.64	1.74	-0.55	-0.83
Total Score	25.81	6.29	-0.96	0.53	26.02	6.24	-1.03	0.73	25.62	6.34	-0.90	0.36

Note: Items are reproduced from Diener et al. (1985)

Table 3
Fit indices for the single-factor model of the SWLS

Model	χ^2_{s-B}	df	CFI	NNFI	RMSEA	Δ CFI
Total sample	259.68	5	.996	.993	0.081 [0.073, 0.089]	
Caregivers	137.28	5	.996	.993	0.084 [0.072, 0.096]	
Non-caregivers	104.46	5	.997	.993	0.070 [0.059, 0.082]	
Configural invariance	237.27	10	.997	.993	0.076 [0.068, 0.085]	
Equality constraints on factor loadings	219.51	14	.997	.996	0.061 [0.054, 0.069]	<.001

Note: N = 7790; Caregivers, n = 3754; Non-caregivers, n = 4036; χ^2_{s-B} = Satorra-Bentler chi-square; df = degrees of freedom; CFI = comparative fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation with 90% confidence interval; Δ CFI = CFI configural invariance model – CFI constrained model

models corresponding to the total sample, caregivers, and non-caregivers are shown in Figures 1, 2, and 3, respectively; all values are statistically significant.

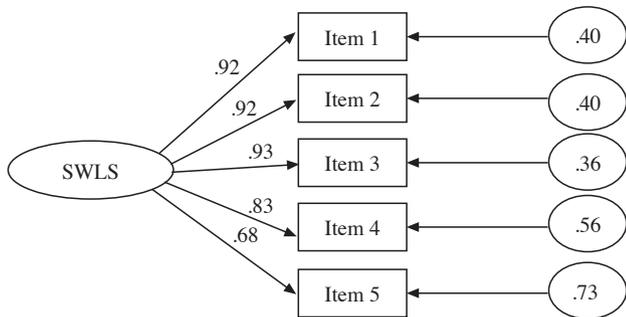


Figure 1. Single-factor model of the SWLS with standardized factor loadings for the total sample

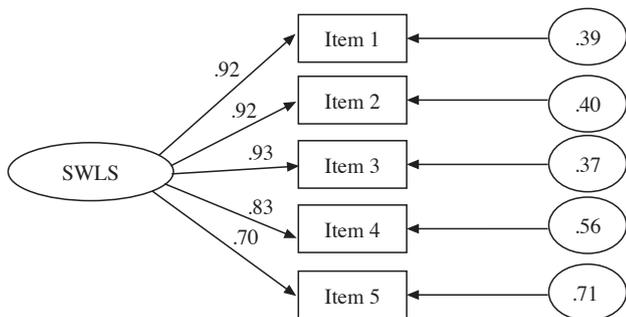


Figure 2. Single-factor model of the SWLS with standardized factor loadings for caregivers

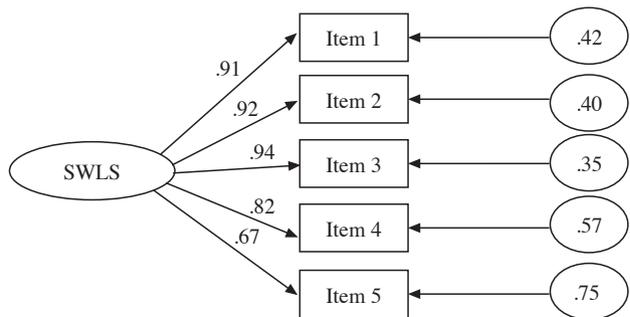


Figure 3. Single-factor model of the SWLS with standardized factor loadings for non-caregivers

Item-Total Correlation and Estimation of Score Reliability

Table 4 shows the corrected item-total correlations for caregivers and non-caregivers. All values were above .30, and therefore satisfactory. Table 4 also displays McDonald’s omega coefficients. The values obtained of .93 for the total sample, .94 for caregivers, and .93 for non-caregivers indicate satisfactory and similar reliability of test scores.

Validity Evidence Based on Relationships With Other Variables

Missing data in correlates were imputed via multiple imputation by chained equations. The proportion of missing data for these variables was always below 30%: Quality of life (n = 427, 5.5%), control (n = 63, 2.1%), autonomy (n = 184, 2.4%), self-realization (n = 139, 1.8%), pleasure (n = 117, 1.5%), loneliness (n = 102, 1.3%), depression (n = 71, 0.9%), positive social support (n = 397,

5.1%), negative social support ($n = 593, 7.6\%$), self-reported health ($n = 3, <.01\%$), ADL and IADL ($n = 1, <.01\%$), and number of health conditions ($n = 1810, 23.2\%$). Analyses were performed across 30 imputed datasets and combined using Rubin's rules (Rubin, 1987). Sensitivity analyses revealed similar patterns, with only minor differences (ranging from $-.02$ to $.05$) between the correlation coefficients obtained with imputed and complete cases.

The results showed that SWLS scores were positively related to quality of life and its subscales (CASP-19), positive social support, and self-reported health, and negatively related to loneliness (UCLA), depression (CES-D-8), negative social support, number of health conditions, difficulties in ADL, and difficulties in IADL (Table 5). The association of SWLS with quality of life and its subscales, loneliness, and depression was strong, insofar as all correlations were around $|.50|$; the other correlations were weak or moderate. These associations were found for the total sample and were consistent across caregiving status.

Discussion

The aim of this study was to extend knowledge about the psychometric properties of the SWLS for caregiving research,

With respect to validity evidence based on relationships with other variables, the results are again consistent with previous research. Scores on the SWLS were positively correlated with scores on quality of life (Vera-Villarroel et al., 2012), positive social support (Borg & Hallberg, 2006; Chappell & Reid, 2002; De Oliveira & Hlebec, 2016; Khusaifan & El Keshky, 2017; Lee et al., 2020; Waldron-Perrine et al., 2009), and self-reported health (López-Ortega et al., 2016; Reizer & Hetroni, 2015; Van Beuningen, 2012), and negatively correlated with loneliness and depression (Khusaifan & El Keshky, 2017; Lee et al., 2001, López-Ortega et al., 2016; Lee et al., 2020); these associations held for the total sample and for both the caregiver and non-caregiver groups. We also found negative associations between SWLS scores and negative social support, the number of health conditions, and difficulties in ADL and IADL. Although the latter associations have been reported in previous studies of life satisfaction in ageing populations (Elmståhl et al., 2020; Liu et al., 2020; Martyr et al., 2018; Puvill et al., 2019), to the best of our knowledge there are no studies that have examined the association between life satisfaction and indicators of multimorbidity (i.e., number of conditions) and disability (e.g., ADL and IADL) in caregivers. These findings not only provide new validity evidence for the

Table 4
Corrected item-total correlations for the SWLS, and McDonald's omega

SWLS items	Total sample (N = 7790)	Caregivers (n = 3754)	Non-caregivers (n = 4036)
In most ways my life is close to my ideal	.83	.84	.82
The conditions of my life are excellent	.82	.82	.82
I am satisfied with my life	.84	.85	.84
So far, I have gotten the important things I want in life	.75	.76	.74
If I could live my life over, I would change almost nothing	.62	.64	.60
McDonald's omega	.93	.94	.93

Note: Items are reproduced from Diener et al. (1985)

using data from a large population sample of English older adults. We provide validity evidence based on the internal structure of the scale and on relationships with other relevant variables, and also report the reliability of test scores and measurement invariance across caregivers and non-caregivers.

Regarding validity based on the internal structure, the CFA supported the single-factor structure, which is in line with the results obtained in other populations (Checa et al., 2019; Vázquez et al., 2013; Whisman & Judd, 2016), and also with caregivers of clinically referred-youth (Athay, 2012). The analysis of configural and metric invariance also provided evidence supporting the use of the SWLS in the caregiver population, including for comparisons with non-caregiver samples. In addition, the values of McDonald's omega coefficient (around .93) indicated satisfactory and similar reliability of test scores for both caregivers and non-caregivers. These findings provide further evidence about the factorial invariance of the SWLS, which has already been reported across gender, age, countries, cultures, marital status, level of education, and clinical and non-clinical samples (Bacro et al., 2020; Checa et al., 2019; Emerson et al., 2017; Esnaola et al., 2017; Jang et al., 2017; Jovanovic et al., 2020; Whisman & Judd, 2016), and they are crucial for future research into life satisfaction among caregivers and for comparisons in terms of caregiver status.

Table 5
Correlations between SWLS scores and scores on other variables

Variables	SWLS		
	Total sample (N = 7790)	Caregivers (n = 3754)	Non-caregivers (n = 4036)
Quality of life	.68***	.69***	.66***
Control	.50***	.51***	.49***
Autonomy	.46***	.47***	.45***
Self-realization	.63***	.64***	.61***
Pleasure	.54***	.57***	.51***
Loneliness	-.52***	-.54***	-.51***
Depression	-.48***	-.48***	-.48***
Positive social support	.41***	.43***	.39***
Negative social support	-.16***	-.18***	-.14***
Self-reported health	.35***	.33***	.36***
ADL	-.23***	-.21***	-.25***
IADL	-.24***	-.21***	-.27***
Number of health conditions	-.18***	-.17***	-.19***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; ADL = difficulties in activities of daily living; IADL = difficulties in instrumental activities of daily living

SWLS based on relationships with other variables in caregivers but also highlight the need for further longitudinal research to improve our understanding of the relationship between physical and mental health in this population.

The present study has both limitations and strengths. Regarding the former, data on the type of care provided and the relationship to the care recipient were limited, and hence additional smaller group comparisons were not possible in the present study. A task for future research is therefore to consider these caregiving characteristics and to examine potential differences in the association with the correlates analysed here. The fact that nearly 60% of our sample were long-term caregivers suggests that the associations found with other variables are likely to be representative of this population, although the heterogeneity among medium- and short-term caregivers limits our ability to perform comparisons based on caregiving duration. Further longitudinal research taking into account caregiving duration is needed. It should also be noted that although ELSA includes a representative sample of the English population, not all respondents provided an answer for caregiving status or all items of the SWLS, which may limit the generalizability of results. Furthermore, data were extracted from self-reports, and therefore potential recall bias cannot be ruled out. Finally, our aim here was to provide validity evidence supporting the use of the SWLS in the caregiver population and for comparisons with non-caregiver samples, to which end we employed a cross-sectional design. Consequently, no directionality or causality can be inferred from our findings.

Despite the aforementioned limitations, a major strength of this study is its unique and large sample size, which is not only expected to be representative of the ageing population in England but also of those within this population who are informal caregivers. In an ageing society with an increasing number of older adults fulfilling a caregiving role, research into ways of improving their life and well-being is a priority. The present study is the first to provide validity evidence for the SWLS in a large sample of caregivers and to confirm its adequacy for comparisons between caregivers and non-caregivers. These findings have both methodological and, potentially, public health implications, insofar as the assessment of life satisfaction with the SWLS could provide a quick screening of the psychological health status of informal caregivers, thereby helping to identify those in need of support.

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