Psychometric properties of the PERMA-Profiler for measuring well-being in Spanish older adults.

Abstract

Objectives: PERMA model of well-being proposed by Seligman (2011) includes hedonic and eudaimonic components to assess well-being: Positive Emotions, Engagement, Relationships, Meaning and Accomplishment. Butler and Kern (2016) have proposed a measuring instrument based on this model which has not yet been validated in the Spanish older adult population. The aim of this study is to explore the psychometric properties of the PERMA-Profiler in a sample of Spanish older adults. Method: 330 elderly people (Mage=70.21; SDage=4.75; 61.5% men) participated at baseline, of whom, 142 were measured at the second wave after 6 months. Results: The five factor structure obtained in the original scale and in other validation studies was replicated. The instrument offered good rates of internal consistency and test-retest reliability as well as good concurrent, predictive and criterion validity. Conclusions: PERMA-Profiler instrument has good psychometric properties to evaluate well-being Spanish older adults. The main limitations of the study are the use of self-reports, the absence of institutionalized participants, the relatively modest sample size or not including a measure of hedonic well-being to explore the scale concurrent validity.

Keywords: PERMA-Profiler, elderly, well-being, eudaimonic, validation, psychometric properties.

Introduction

Over the past few decades, research on well-being has proliferated (Forgeard et al., 2011; Hone et al., 2014), being the main subject of study of positive psychology (Seligman, 2011). In the case of the eldest population, emphasis has been placed on well-being and positive psychological variables (such as resilience, meaning, self-efficacy or personal fulfilment). The role of these factors in adapting to the aging process have been consistently contrasted in important recent studies (e.g., Steptoe et al., 2015). Since older adults face important life events, such as retirement, widowhood, or illness (Paúl, 2007), the transition associated with the onset of aging can be particularly difficult and challenging. Aging, therefore, entails important life transitions and often implies different losses: affective, role-related, or of physical and/or functional capabilities. Given these changes, positive psychological variables have shown a protective role in the mental health of older adults (Han et al., 2015; Madsen et al., 2019). In addition, these variables are highlighted in the models proposed in World Health Organisation (WHO) initiatives of Active Aging (International Longevity Centre of Brazil, 2015) and Healthy Aging (WHO, 2015).

The experience of wellness is an indicator of a positive trajectory in the aging process, associated with lower levels of anxiety, depression, and general stress (Archer et al., 2015; Lukaschek et al., 2017; Zhang et al., 2020). In addition, it goes further, being linked to feeling good, being able to cope positively with daily stressors while being aware of one´s own strengths and becoming an active member of society (International Longevity Centre of Brazil, 2015; Keyes 2005, 2010; Seligman 2011; OMS 2015). Older adult's well-being is associated with positive psychological variables such as perceived social support (Moeni et al., 2018), meaning in life (Zhang et al., 2018), character

strengths (Zhang et al., 2020), resilience (Smith & Hanni, 2019), good physical health and greater longevity (Steptoe, 2019).

Given these benefits, several theories have focussed on identifying the principal components of psychological well-being, that is, those which lead people to evaluate their lives in positive terms (Butler & Kern, 2016; Forgeard et al., 2011; Hone et al., 2014). Thus, there are two principal theoretical approaches to knowledge of psychological well-being and its measurement: hedonic and eudaimonic (Delle Fave et al., 2011a; Dodge et al., 2012; Stoll, 2014). The hedonic view equates happiness with pleasure, comfort and fun (Diener & Seligman, 2002), while the eudaimonic perspective regards happiness as the human capacity to pursue complex goals which have meaning for the individual and society (Della Fave et al., 2011). Based on these two broad perspectives, different theories have been developed, some of them with their own tools to evaluate psychological well-being or its specific components (Butler & Kern, 2016; Huppert, 2014; Wammerl et al., 2019).

The instruments to evaluate *hedonic well-being* have been widely validated (Cooke et al., 2016; Zhang & Chen, 2019), especially using the Satisfaction With Life Scale (Diener et al., 1985) which provides a global estimation of a person's life satisfaction. However, there is less evidence of the reliability and validity of multidimensional instruments focussed on *eudaimonic well-being* (Organisation for Economic Co-operation and Development, 2013). The most developed is the theory of Psychological Well-being (originally based on the elderly) and its corresponding questionnaire, The Psychological Well-being Scales, by Ryff and Keyes (1995), which uses a six-factor model of well-being: Self-acceptance, Autonomy, Personal Growth, Environmental Mastery and Positive Relationships. Although the Scales have been validated on a large number of different

samples, in recent years its psychometric properties have been questioned (Abbott et al., 2006; 2009).

Hedonism and eudaimonia variables are independent and not mutually exclusive (Huta & Ryan, 2010). Therefore, different authors have claimed the need to propose integrated models (e.g., Delle Fave et al., 2011b) because they consider that the highest levels of well-being are achieved by combining high scores in the hedonic and eudaimonic dimensions. This idea is also confirmed in older adults' population (Carver & Buchanan, 2016; Cosco et al., 2014), although more research must be developed to explain more deeply how both perspectives interact during aging (Araújo et al., 2017).

For this reasons, some theories have also emerged which include both hedonic and eudaimonic aspects, such as the PERMA theory, developed by Seligman (2011). It defines "well-being" as a dynamic psychosocial state that arises from the proper functioning of multiple psychosocial aspects (Butler & Kern, 2016). According to Seligman (2011, pp. 16-25), five elements are necessary in order to achieve this state of well-being: Positive emotions, Engagement, Relationships, Meaning and Accomplishment. This is not a new form of well-being, nor a notion of well-being that only encompasses these five components but rather a parsimonious model (Seligman, 2018); that is, Seligman (2018) tries to make a proposal that explains as much well-being as possible with a small number of elements, considering that these five as those which are most effective.

Positive emotions include affective aspects such as pleasure, enjoyment, gratitude or hope (Seligman, 2002). *Engagement* (or flow), refers to the psychological state in which a person becomes one with a task and, more or less, loses his sense of time and self-awareness (Seligman, 2002). *Positive relationships* consist of the positive relations with others, characterised by emotional and instrumental support, intimacy, trust, feelings of

belonging and other protective indices of physical and mental health (Carmichael et al., 2015; Chopik, 2017; Feeney & Collins, 2015; Gable et al., 2006). *Meaning* may be defined as a purpose in life or of serving something greater than one's own self (Seligman, 2002). Finally, *accomplishment* is the search for personal fulfilment driven by one's desire to meet personal goals or objectives (Giangrasso, 2018).

The importance of all of these components and their contribution to the emotional well-being of older adults has been confirmed. The beneficial effects of positive emotions (Riffin et al., 2014), engagement (Kuykendall et al., 2015), perceived positive relationships (Kern et al., 2013), meaning (Friedman & Kern, 2014) and accomplishment (Hirst et al., 2013) have been amply demonstrated. In addition, in the case of engagement, although it is an important component of successful aging (International Longevity Centre of Brazil, 2015), there have been few attempts to measure it in older adults beyond participation in activities (Butler & Kern, 2016).

Studies have investigated the model of psychological well-being proposed by Seligman (2011) among the elderly as a component of the aging process (Momtaz et al., 2016; Sorrell, 2017). However, PERMA is a novel concept, and more research is needed that delve into it in older people, for its conceptualisation and application in the field of gerontology (Momtaz et al., 2016).

Some instruments have been created to evaluate the PERMA psychological well-being model, such as The Flourishing Scale (Diener et al. 2010), Inventory of Thriving (Su et al. 2014) or The Flourishing Items (Hupper & So, 2013). However, these questionnaires suffer from certain limitations, including the lack of items to measures the various components of the PERMA model or the inclusion of other variables which are not contained in the model proposed by Seligman (2011). Hence, Butler and Kern (2016)

developed the *PERMA-Profiler,* a multidimensional instrument which measures the five well-being factors of the PERMA model.

The *PERMA-Profiler* has been translated and validated among various cultures, specifically, adult Italians (Giangrasso, 2018), Greeks (Pezirkianidis et al., 2019), German speakers (Wammerl et al., 2019), Australians (Bartholomaeus et al., 2020; Ryan et al., 2019), Turks (Demirci et al., 2017), Portuguese (Alves et al., 2023), Mexicans (Chaves et al., 2023) and Brazilians (de Carvalho et al., 2021), showing good psychometric properties. With respect to other stages of life cycle, its psychometric properties have also been studied in Chilean youths (Cobo-Rendón et al., 2020) and, to date, only two validation studies have been found for general elderly population (Hernández-Suárez et al., 2018; Payoun et al., 2020) and another one for Portuguese tourists older than 55 years old (Mendes et al., 2022); the instrument has not yet been validated in Spain and specifically not for Spanish older adults. Most of these validations (Chaves et al., 2023; Cobo-Rendón et al., 2020; de Carvalho et al., 2021; Demirci et al., 2017; Giangrasso, 2018; Pezirkianidis et al., 2019; Wammerl et al., 2019) replicate the five-factor structure of the original version by Butler and Kern (2016). Some, however, have suggested a unidimensional (Hernández-Suárez et al., 2018; Ryan et al., 2018; Tansey et al., 2017) or a second order (Bartholomaeus et al., 2020) structure. There are even researchers who, despite opting for the 5-factor structure, find a superior fit of the bifactor model, in which each item simultaneously loads on both one of the 5 specific factors and on a general factor (Wammerl et al., 2019). These versions also present adequate levels of reliability, both for the complete scale and the subscales (Giangrasso, 2018; Pezirkianidis et al., 2019; Wammerl et al., 2019).

Another positive aspect of this instrument is that, in addition to the five principal subscales to measure each of the components of the PERMA model, it also includes others which measure variables with a single item. This is especially beneficial in the case of the elderly, as brief questionnaires are useful when surveying this population group (Abd et al., 2019; Bowling et al., 2013).

Considering the absence of an instrument to evaluate Seligman's PERMA model (2011) among older adults, and the importance of psychological well-being among this population, the aim was to translate, adapt and evaluate the psychometric properties of the Spanish version of the *PERMA-Profiler* among a sample of Spanish older adults.

Method

Sample

The sample consisted of 330 older adults in the Community of Madrid, Spain, between 65 and 90 years old (M=70.21; SD=4.75), of whom 61.5% were men. A total of 142 people participated in the second wave of the study after a period of 6 months. The sociodemographic data of the sample are provided in Table 1.

Table 1. Descriptive statistics of the sample.

		Wave 1		Wave 2	
		N	*%*	*N*	*%*
Gender	Man	203	61.5	89	62.7
	Woman	127	38.5	53	37.3
Education level	Without studies	6	1.8	1	0.7
	Primary studies	19	15.8	13	9.2
	Secondary studies	37	11.2	19	13.4
	Baccalaureate studies	93	28.2	42	29.6
	University studies	175	53	67	47.1
Civil status	Married	210	63.6	108	76.1
	Widowed	53	16.1	9	6.3
	Single	23	7	9	6.3
	Divorced	32	9.7	13	9.2
	Separated	10	3	3	2.1
Sufficient economic conditions	Yes	231	70	-	-
	No	56	17	-	-
Diagnosed illnesses	Yes	160	48.5	-	-

No	170	51.5	-	-

Procedure

Firstly, the instrument by Butler & Kern (2016) was translated into Spanish using the forward-backward translation method. That is, the tool was first translated into Spanish independently by three bilingual translators and specialists in psychological well-being. The three translators then combined their versions to produce a single adaptation. Then, three different translators, also bilingual specialists in the subject, retranslated the text back into English (back translation). They met to present a unified version of the instrument in English, identical to the original by Butler & Kern (2016). Once the translation process was complete, the sample collection was carried out. All participants were provided with an informed consent form and completed the questionnaire by means of a computer assisted interview (C.A.W.I.). The study was approved by the Ethics Committee of the Francisco de Vitoria University (registration number: 34/2019) and adhered to the principles of the Helsinki Declaration (59th General Assembly of the World Medical Association, Seoul, October 2009) for research with human beings.

Measurement instruments

PERMA well-being model

PERMA-Profiler (Butler & Kern, 2016) is an instrument to measure multidimensional psychological well-being, based on the PERMA theory developed by Seligman (2011). It has a total of 23 items, three for each dimension of PERMA. It also includes 8 additional items to measure happiness (1 item), negative emotions (3 items: sadness, anger and anxiety), loneliness (1 item) and perceived physical health (3 items).

The response format is on a scale of 11 points ranging from: (i) from 0 (never) to 10 (always); (ii) from 0 (not at all) to 10 (completely); and (iii) from 0 (very bad) to 10 (excellent). The average score for the items of each dimension is calculated, with higher scores indicating greater levels of well-being in each of the PERMA components. The instrument also provides a global score, calculated as the average of the 15 PERMA items. The original version has high reliability, with an alpha value of .94 in the global score and with values in the subscales ranging between .72 (engagement) and .90 (meaning) (Butler & Kern, 2016).

Depressive symptomology

Depressive symptomology was measured using the Depression Scale of the Centre for Epidemiological Studies (CES-D; Radloff, 1977), which evaluates the appearance of symptoms of depression within the last week. The scale consists of 20 items (for example, "I feel I can't shake off the sadness, even with the help of my family or friends") with four possible responses on a Likert-type scale (from 0 = "rarely or never" to 3 = "all the time"). High scores suggest high levels of depressive symptoms. The alpha coefficient of the original scale ranged from .85 (general population) to .90 (clinical population). The cut-off which suggests a case of clinical depression is generally set equal to or above 16 on the scale (Radloff, 1977). In recent studies of older Spanish adults obtained an adequate reliability score (α = .86) (Fernández-Fernández et al., 2020). The present study showed good reliability (Cronbach's alpha), scoring .89 in the first wave and .87 in the second.

Psychological well-being – eudaimonic

Psychological well-being was evaluated using the Spanish adaptation of the Van Dierendonck (2005) version of the Psychological Well-being Scales originally proposed by Carol Ryff (Keyes et al., 2002; Ryff, 1989; Ryff & Keyes, 1995). The Spanish version was validated by Díaz et al. (2006). The scale consists of 29 items (for example, "looking back, I am happy with my life") divided into six subscales (purpose in life, environmental mastery, positive relationships, self-acceptance, autonomy, and personal growth). High scores on this scale suggest high levels of psychological well-being. The possible responses on a Likert-type scale are from 0 to 5 (0 = totally disagree; 5 = totally agree). Other studies with older adults showed good rates of reliability, with a global Cronbach's alpha of .87 (Fernández-Fernández et al., 2020). The global internal consistency (Cronbach's alpha) of the scale in the present study was .92, in both the first and second waves.

Resilience

Resilience, understood as the ability to deal with stress in a highly adaptive manner, was evaluated using the Brief Resilience Coping Scale (BRCS; Sinclair & Wallston, 2004). This is a questionnaire of 4 items with 5 possible responses on a Likert-type scale (1=does not describe me at all; 5=describes me very well), validated with Spanish older adults (Tomás et al., 2012). The internal consistency reported by the Spanish validation with older adults was high and similar to that found in the present study .76 and .83 in the wave 1 and wave 2, respectively.

Data analysis

Preliminarily, multivariate normality assumption was tested, obtaining a standardized Mardia's coefficient of 49.12 that showed non-normal data (Ullman, 2006). The factor structure (factorial validity) of the PERMA was explored by confirmatory factor analysis (CFA) via Structural Equation Modeling (SEM) methodology, testing both the five-factor structure found by Butler & Kern (2016) and other researchers (Chaves et al., 2023; Cobo-Rendón et al., 2020; de Carvalho et al., 2021; Demirci et al., 2017; Giangrasso, 2018; Pezirkianidis et al., 2019; Wammerl et al., 2019). Additionally, the single-factor (Hernández-Suárez et al., 2018; Ryan et al., 2018; Tansey et al., 2017), second order factor (Bartholomaeus et al., 2020) and bifactor (Wammerl et al., 2019) structures were also tested. Due to multivariate non-normality, the robust maximum likelihood estimation method was used and the goodness of fit of the model was evaluated by: (i) the Satorra–Bentler χ^2 robust statistic (S-B χ^2), its degrees of freedom (df), and p value; (ii) the Comparative Fix Index (CFI), as an incremental fit index; and the (iii) the Root Mean Square Error of Approximation (RMSEA) with its 90% confidence interval (CI). An adequate model fit was defined as S-B χ^2 p value ≥ 0.05, CFI ≥ 0.92, and RMSEA ≤ 0.07 (Hair, Black, Babin, & Anderson, 2014).

Subsequently, the CFA-based reliability was tested using the composite reliability (CR), because in SEM Cronbach's alpha can overestimate or underestimate the true reliability (Garson, 2012). CR values ≥ 0.70 are considered adequate (Hair et al., 2014). It was also calculated the Cronbach's Alpha of the subscales and the global score, to assess reliability in those factors that are not included in the CFA. In addition, the PERMA test-retest reliability was explored in those respondents who participate in the 6-month follow-up (n = 142), using the intraclass correlation coefficient (ICC). ICC values between

.40 and .75 represent fair to good test-retest reliability, as well as values ≥ 0.75 indicate excellent test-retest reliability (Fleiss, 1999).

Later, in addition to reporting descriptive statistics, possible gender differences in the use of the different dimensions evaluated by PERMA were explored using a t-test. These differences were also analysed for the rest of the study variables (age, depressive symptoms, psychological well-being and resilience). To quantify the magnitude of these differences Cohen's d was calculated, with values of .80, .50, and .20 indicating large, medium, and small effect sizes, respectively (Cohen, 1988).

Convergent and discriminant validity were assessed by bivariate Pearson correlations between the PERMA subscales and related variables (i.e., depressive symptoms, psychological well-being and resilience). Otherwise, to analyse predictive validity, multiple linear regression analyses were performed to test if depression and well-being (2nd wave) could be predicted from previous PERMA subscales scores (1st wave). Null hypotheses were rejected at a .05 significance level.

Finally, criterion validity was tested by performing comparisons (t-tests) in the PERMA subscales between older adults with depressive symptomatology (CES-D scores ≥ 16) and those older adults with no depressive symptomatology (CES-D scores < 16), according to cut-off points previously used in Spanish older populations (Latorre et al., 2012).

All analyses were carried out using IBM SPSS version 22.0 (Armonk, NY, USA), except SEM analyses, for which EQS version 6.2 (Encino, CA, USA) was employed.

Results

Confirmatory factor analysis

Firstly, in line with some studies (Hernández-Suárez et al., 2018; Ryan et al., 2018; Tansey et al., 2017), a one-factor model was tested in which the 15 items loaded on a single general well-being factor (Model 1). This model obtained, however, a very poor fit. Subsequently, in line with the authors of the original version (Butler & Kern, 2016) and the majority of the international validations (Chaves et al., 2023; Demicri et al., 2017; Pezirkianidis et al., 2019; Wammerl et al., 2019), the 15 items were grouped into 5 dimensions (Model 2): *positive emotions* (items 3, 13 y 22); *engagement* (items 2, 10 y 17); *relationships* (items 8, 19 y 21); *meaning* (items 7, 9 y 20); and *accomplishment* (items 1, 5 y 15). The CFA results revealed an unsatisfactory fit of the model (Table 2). Modification indices showed that adding a covariance between accomplishment items 1 and 15 would result in an improved overall fit of this model. To apply this procedure properly, it is necessary that they are items that belong to the same factor and that are theoretically related with respect to their content (Garson, 2012). Thus, given that previous research with the PERMA-Profiler have correlated the error terms of both items (Pezirkianidis et al., 2019), a third model (Model 3) was tested in which such a covariance was added. The second order model suggested by some authors (Bartholomaeus et al., 2020) was also tested. This Model 4 yielded both improper solutions (non-significant variances for some factors) and an insufficient overall fit. Ultimately, in accordance with Wammerl et al. (2019), a bifactor model was tested (Model 5). Although the model revealed good fit (see Table 2), it showed, as is often the case in this type of models (Eid et al., 2017), both improper solutions (non-significant variances) and anomalous results (non-significant factor loadings of certain items). Thus, these results indicate that the most stable and appropriate structure is the 5-factor structure (Model 3). As can be seen

in Figure 1, Model 3 does achieve adequate overall fit, also showing reasonable R2 and λ

values for all items (see Figure 1).

Table 2. Goodness of fit indices for the models assessed

Models assessed	S-B χ^2	df	p	CFI	RMSEA	RMSEA 90% CI	Anomalous results or improper solutions
Model 1. Single-factor	287.270	90	< 0.001	0.832	0.082	[0.071 - 0.092]	No
Model 2. Correlated five-factor	181.166	80	< 0.001	0.914	0.062	[0.050 - 0.074]	No
Model 3. Correlated five-factor with item 1 and item 15 correlated errors	171.908	79	< 0.001	0.921	0.060	[0.047 - 0.072]	No
Model 4. Second order general factor with five first order factors	193.483	82	< 0.001	0.905	0.064	[0.052 - 0.076]	Nonsignificant factor variances
Model 5. Bifactor with a general factor and five specific uncorrelated factors	166.658	75	< 0.001	0.922	0.061	[0.048 - 0.073]	Nonsignificant loadings and factor variances

Note. S-B χ^2 = Satorra-Bentler χ^2 statistic; *df* = degrees of freedom; *CFI* = Comparative Fit Index; *RMSEA* = Root Mean Square Error of Approximation; *RMSEA 90% CI = 90%* Confidence Interval of the Root Mean Square Error of Approximation
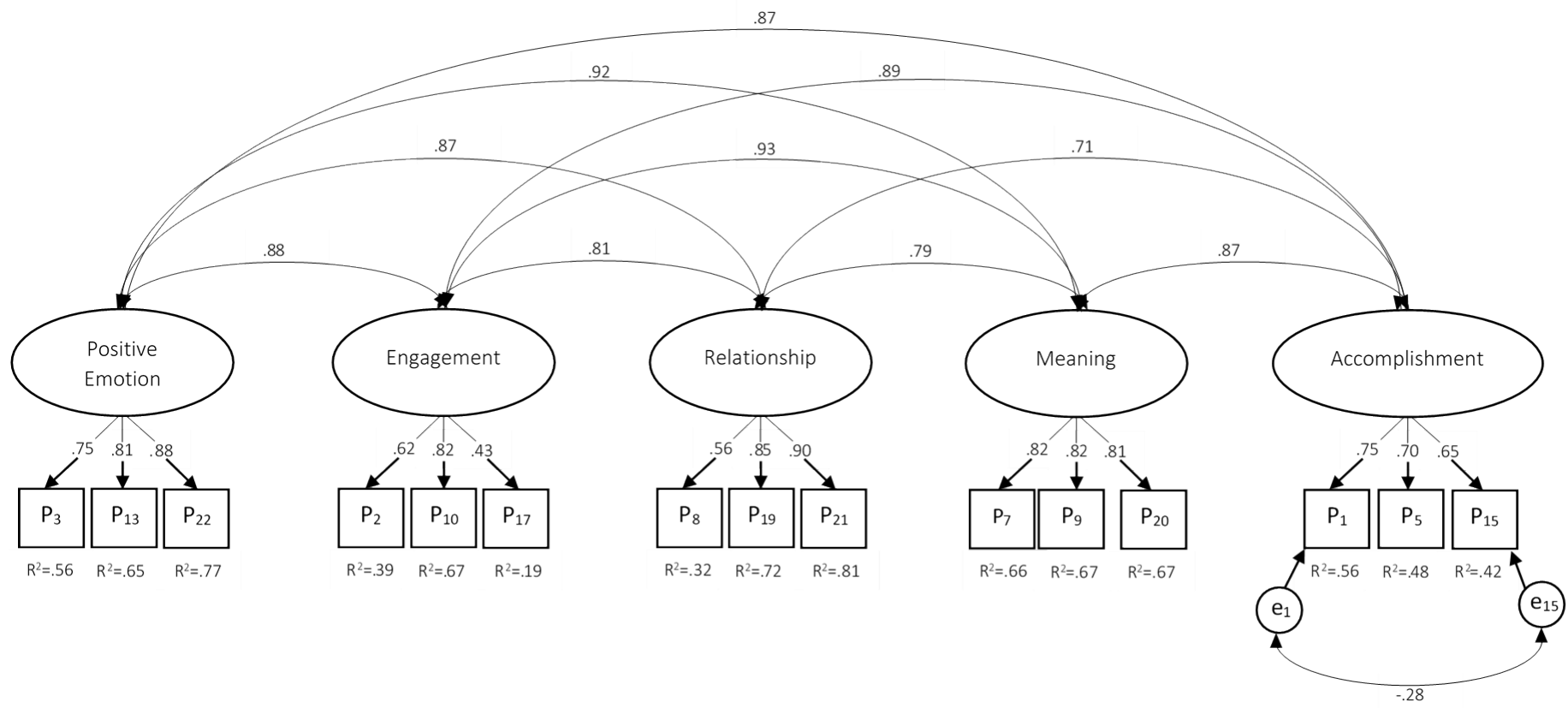
Figure 1. PERMA factor structure (Model 3) in older adults (n = 330).

Reliability

The psychometric properties of Model 3 were analysed (the reliability indexes and descriptive statistics of the dimensions are shown in Table 3). In general, the scores for composite reliability were adequate, except for the dimension of *engagement*, both in the first and second wave, and for the dimension *accomplishment* in the second wave. The Cronbach's alphas were similar to the composite reliability indices and were considered appropriate in all subscales except *engagement* (in both waves) and negative emotions in the first wave. All intraclass correlation coefficients were statistically significant showing that test-retest reliability scores were between good and excellent.

Table 3. Descriptive statistics, test-retest reliability and internal consistency for the dimensions and the total score of the PERMA scale.

PERMA subscales	M_1 (SD) n = 330	M_2 (SD) n = 142	ICC_{1-2}	α_1	α_2	CR_1	CR_2
Positive emotion	7.42 (1.47)	7.34 (1.42)	.77**	.86	.81	.86	.80
Engagement	7.21 (1.57)	7.25 (1.50)	.75**	.65	.61	.67	.66
Relationship	7.78 (1.56)	7.85 (1.52)	.83**	.78	.77	.82	.79
Meaning	7.24 (1.64)	7.10 (1.75)	.85**	.86	.87	.86	.85
Accomplishment	7.21 (1.41)	7.02 (1.39)	.73**	.70	.72	.74	.61
PERMA overall score	7.37 (1.30)	7.31 (1.23)	.87**	.93	.91	-	-
Negative emotion	3.86 (1.75)	3.84 (1.87)	.80**	.67	.75	-	-
Physical health	7.06 (1.79)	7.26 (1.50)	.84**	.90	.92	-	-
Loneliness (single item)	3.09 (2.95)	3.27 (3.12)	.42**	-	-	-	-
Happiness (single item)	7.63 (1.55)	7.67 (1.69)	.66**	-	-	-	-

Note. **p<.01; *M* = mean; *SD* = standard deviation; *ICC* = intraclass correlation coefficient; *CR* =composite reliability score; *α* = Cronbach's alpha; [1] = wave 1; [2] = wave 2

Differences between men and women

As shown in Table 4, most of the differences between men and women in the five principal subscales of the PERMA were not statistically significant, except for positive emotions, scoring men higher than women (small effect size). However, except for physical health, the additional dimensions included in the PERMA model do show statistically significant differences between these groups. Men scored lower in negative

emotions (moderate effect size) and loneliness (small effect size) and higher in happiness (small effect size) than women. Furthermore, beyond PERMA, we analysed the differences by gender for the variables of age, depressive symptomatology, psychological well-being and resilience: men showed fewer depressive symptoms than men (effect size between small and moderate).

Table 4. PERMA scores: Results of the Student's t test among men and women.

PERMA subscales	Men n = 203		Women n = 127				
	M_{men}	SD_{men}	M_{women}	SD_{women}	t	p	Cohen's d
Positive emotion[a]	7.56	1.29	7.19	1.70	2.11	0.03	.25
Engagement[a]	7.34	1.40	6.98	1.80	1.88	0.06	.22
Relationship[a]	7.89	1.38	7.59	1.76	1.65	0.10	.19
Meaning	7.33	1.57	7.08	1.74	1.32	0.18	.14
Accomplishment[a]	7.24	1.28	7.15	1.60	0.53	0.59	.06
PERMA Overall score[a]	7.47	1.11	7.20	1.54	1.73	0.08	.21
Negative emotion	3.56	1.77	4.34	1.61	-4.04	<0.001	-.44
Physical health	7.14	1.72	6.91	1.88	1.12	0.26	.12
Loneliness (single item)	2.77	2.89	3.59	2.97	-2.46	0.01	-.27
Happiness (single item)[a]	7.78	1.38	7.38	1.77	2.25	0.02	.25
Age, depressive symptomatology, psychological well-being and resilience	Men n = 298		Women n = 111				
	M_{men}	SD_{men}	M_{women}	SD_{women}	t	p	Cohen's d
Age	70.55	5.00	69.65	4.26	1.67	0.09	.19
Depressive symptomatology[a]	9.70	7.70	12.30	9.61	-2.44	0.01	-.30
Psychological well-being[a]	103.97	18.14	101.95	20.82	0.89	0.37	.10

	M	SD	M	SD	t		
Resilience[a]	14.93	2.97	14.64	3.50	0.72	0.47	.09

Note. [a] = equal variances not assumed; *M* = mean; *SD* = standard deviation; *t* = Student's t.

Concurrent validity

Convergent and divergent validity were determined by calculating Pearson bivariate correlation between each PERMA subscale, as well as the global score and the scores for depressive symptomatology, psychological well-being, and resilience, all measured at the same time (Table 5). All relations were statistically significant, except for the association between physical health and depressive symptomatology in the second wave.

In wave 1, higher scores in positive emotions, engagement, relationships, meaning, accomplishment, the general score, happiness and physical health were associated with lower levels of depressive symptomatology. By contrast, negative emotions and loneliness showed an inverse correlation to depressive symptomatology. These results were also found in wave 2, except for physical health.

For psychological well-being, results from the first wave showed a direct correlation between this variable and positive emotions, engagement, relationships, meaning, accomplishment, the general scale, happiness, and physical health. An inverse relation was found between psychological well-being and negative emotions and loneliness, with higher scores in well-being when these two dimensions scored lower. All these correlations were also found in the second wave.

Finally, positive correlations were found between resilience and positive emotions, engagement, positive relationships, meaning, accomplishment, the general scale, happiness, and physical health. Significant and inverse relations were also found between resilience and negative emotions and loneliness. These correlations were also found in the second wave.

The strongest correlations were found between the global score and psychological well-being (waves 1 and 2) and resilience (wave 2).

Table 5. Pearson (r) correlation between PERMA and depression, psychological well-being and resilience.

PERMA	Depressive symptomatology		Psychological well-being		Resilience	
	1st wave n = 309	2nd wave n = 142	1st wave n = 309	2nd wave n = 142	1st wave n = 309	2nd wave n = 142
Positive emotion	-.39**	-.46**	.64**	.61**	.38**	.55**
Engagement	-.39**	-.20*	.47**	.52**	.50**	.45**
Relationship	-.46**	-.27**	.57**	.64**	.36**	.42**
Meaning	-.56**	-.28**	.63**	.61**	.36**	.59**
Accomplishment	-.47**	-.37**	.55**	.60**	.49**	.60**
PERMA overall score	-.59**	-.39**	.68**	.73**	.54**	.64**
Negative emotion	.54**	.58**	-.45**	-.37**	-.18**	-.17*
Physical health	-.35**	-.11	.33**	.30**	.25**	.26**
Loneliness (single item)	.34**	.30**	-.36**	-.51**	-.11**	-.27*
Happiness (single item)	-.60**	-.33**	.62**	.58**	.47**	.48**

Note. **p<.01; *p<.05

Predictive validity

A stepwise multiple linear regression analysis was made to determine the predictive value of each PERMA subscale, measured in the first wave to predict depressive symptoms and psychological well-being. Gender and age were included as control variables. The results are summarised in Table 6.

For the variable depressive symptomatology in wave 1, the model was statistically significant (F=28.68; p<0.001), explaining 38% of variance using the variables of gender, age, positive emotions, relationships and meaning.

The strongest correlations were found between the global score and

psychological well-being (waves 1 and 2) and resilience (wave 2).

For psychological well-being in wave 1 the model was statistically significant (F=40.18; p<0.001), with 47% of variance explained by positive emotions, relationships and meaning.

Table 6. Multiple regression analysis with the PERMA subscales in wave 1 with the variables of depressive symptomatology and psychological well-being (n=309).

	Depressive symptomatology (n = 309)		Psychological well-being (n = 309)	
	β	Δ Adj. R^2	β	Δ Adj. R^2
Step 1		0.04**		0.00
Gender	.16**		-.06	
Age	.14*		-.11	
Step 2		0.34**		0.47**
Positive emotion	-.35**		.25**	
Engagement	.02		.01	
Relationship	-.07*		.20**	
Meaning	-.19*		.20**	
Accomplishment	-.06		.11	

Note. **p<.01; *p<.05; β = standardized Beta coefficient; Δ Adj. R^2, change in adjusted R^2 with significance levels on *F*-change.

Criterion validity

Comparing the scores for the PERMA subscales among the elderly with and without depressive symptomatology, all differences were statistically significant. Those with depressive symptomatology showed lower levels of positive emotions, engagement, relationships, meaning, accomplishment, PERMA overall score, happiness, and physical health with large effect sizes. By contrast, older adults with depressive symptomatology scored higher in negative emotions and loneliness with large effect sizes.

Table 7. Mean differences in PERMA subscales based on depressive symptomatology among participants during the first wave (n=330)

PERMA subscales	Group without depression (n = 233)		Group with depression (n = 76)				
	M	SD	M	SD	t	p	Cohen's d
Positive emotion	7.80	1.14	6.39	1.64	5.64	<0.001	.95
Engagement	7.48	1.37	6.58	1.72	4.14	<0.001	.57
Relationship	8.09	1.26	6.92	1.69	5.53	<0.001	.75
Meaning	7.64	1.36	6.21	1.73	6.56	<0.001	.87
Accomplishment	7.47	1.22	6.53	1.37	5.33	<0.001	.66
PERMA overall score	7.70	1.03	6.53	1.36	6.86	<0.001	.89
Negative emotion	3.39	1.56	5.29	1.49	-9.30	<0.001	-.98
Physical health	7.32	1.60	6.39	2.01	3.68	<0.001	.52
Loneliness (single item)	2.53	2.82	4.59	2.75	-5.54	<0.001	-.69
Happiness (single item)	8.04	1.21	6.42	1.65	7.89	<0.001	.94

Note. [a] = *M* = mean; *SD* = standard deviation; *t* = Student's t.

Discussion

The principal aim of this work was to adapt and validate the *PERMA-Profiler* questionnaire to a sample of Spanish older adults; to date, the psychometric properties of this instrument have not yet been studied in Spanish population and much less among the elderly. The results show similar psychometric properties as those found in other international versions.

In line with the original version (Butler & Kern, 2016) and other validations (Chaves et al., 2023; Cobo-Rendón et al., 2020; de Carvalho et al., 2021; Demirci et al., 2017; Giangrasso, 2018; Pezirkianidis et al., 2019; Wammerl et al., 2019), the results of the CFA replicate the original structure, suggesting five correlated factors (*positive emotions, engagement, relationships, meaning* and *accomplishment*), consisting of three items each. In particular, similar to the Greek version of the PERMA-profiler (Pezirkianidis

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et al., 2019), the five-factor model with a covariance between the measurement errors of items 1 and 15 obtained adequate overall fit.

Regarding the reliability of the instrument, the Spanish version of the *PERMA-Profiler* for the elderly generally shows good results. The internal consistency of the scale was adequate for all subscales and for the global score with the exception of the dimension of *engagement*. Similar results were found in other versions of the *PERMA-Profiler* (Butler & Kern 2016; Demirci et al., 2017; Iasiello et al., 2017; Pezirkianidis et al., 2019; Wammerl et al., 2015). It may be due to the heterogeneous nature of the construct of *engagement* which, in addition to the limited number of items in each subscale (three items per dimension), produces relatively low homogeneity (Pezirkianidis et al., 2019; Wammerl et al., 2015). For the reliability test-retest coefficient, it can be affirmed that the scales of the *PERMA Profiler* show good temporal stability, in line with the findings of other studies (Ayse, 2018; Butler & Kern, 2016; Demirci et al., 2017).

In general terms, there was no significant difference between older men and women however, as found in previous studies (Nolen-Hoeksema, 2012; Shamim & Muazzam, 2018), the results suggest that men experience more positive emotions and less negative emotions than women.

Additionally, the results for concurrent validity of the *PERMA-Profiler* show correlations between the subscales and psychological well-being and psychopathologic symptoms. The convergent validity was demonstrated by positive correlations of the PERMA subscales with measures that exclusively assess eudaimonic or psychological well-being, as is the case with other validations (Butler & Kern, 2016; Wammerl et al., 2015), as well as with resilience levels. Regarding evidence of divergent validity, negative correlations were found between these subscales and depression, as is the case in other

studies (Butler & Kern, 2016; Pezirkianidis et al., 2019). A predictive role was also found

for certain subscales, specifically *positive emotions, relationships* and *meaning*, variables

whose predictive role has been widely demonstrated (King et al., 2006; McGregor &

Little, 1998).

The findings regarding the psychometric properties of the *PERMA-Profiler* among

older adults show it is a good instrument for the evaluation of well-being among the

elderly. Some authors have pointed to the need to measure well-being among older

adults in a briefly manner using a multi-dimensional approach; that is, taking into

consideration both hedonic and eudaimonic factors (Martín-María et al., 2020). The

PERMA-Profiler meets these characteristics and thus can be considered an ideal

instrument for this purpose.

Explanatory models of aging give increasing importance to well-being, not only

from a hedonic perspective but also including eudaimonic factors such as resilience,

personal fulfilment, or the ability to create and maintain relationships (ILC-BR, 2015;

WHO, 2015). Thus, the *PERMA-Profiler* may constitute a good instrument to

operationalise and measure variables which influence different trajectories of aging. In

this line, and in accordance with the aims of the present study, different aging profiles

can be explored using the PERMA model of well-being as used to evaluate the

effectiveness of intervention programs aimed at fostering the well-being of the elderly

and the promotion of positive aging trajectories.

Regarding the limitations of the present study, it should be noted that the sample

consisted of non-institutionalised older adults within the Community of Madrid. It would

be interesting to study psychometric properties of the *PERMA-Profiler* in Spanish older

adults with a greater diversity of demographic and social characteristics. Another

limitation of the study is the use of a self-reporting questionnaire for data collection which may lead to certain biases. Other instruments used to evaluate similar constructs, such as semi-structured interviews, may help to give a more realistic estimation of the levels of well-being among the elderly (Newcomer et al., 2015). Moreover, it should be noted that, to verify the content validity, only a eudaimonic evaluation scale was used, without using one instrument based on the hedonic perspective. In this aspect, it would be useful to analyse the relations of the PERMA subscales with specific variables ("homologous") to determine the content validity and thus be able to synthesise the number of instruments used to evaluate the same constructs. Finally, although the adjustment of the five-factor model is acceptable (some fit indices reach the minimum recommended values by a relatively narrow margin) in this modest-sized study, it would be positive if future research could replicate these results using different and larger samples of older adults.

In conclusion, the results of this study are significant given the need for measurement instruments which evaluate psychological well-being of older adults briefly and with a multi-dimensional approach. This validation study presents evidence of the good psychometric properties of the instrument for Spanish older adults, with good levels of reliability and validity, in line with other international adaptations of the instrument.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval Statement

The study was approved by the Ethics Committee of the Francisco de Vitoria University (registration number: 34/2019) and adhered to the principles of the Helsinki Declaration (59th General Assembly of the World Medical Association, Seoul, October 2009) for research with human beings."

Conflict of interest Statement

No authors of this paper have any conflicts of interest.

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