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Propiedades psicométricas de una escala de resiliencia en cuidadores familiares de adultos mayores

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Resumen

El cuidado de un adulto mayor se ha estudiado no solo como una circunstancia generadora de estrés y deterioro del bienestar para el cuidador, sino también, desde la perspectiva de la psicología positiva, como la disposición de los cuidadores para reaccionar de manera resiliente ante las dificultades experimentadas. El objetivo del presente estudio fue realizar la validación de constructo del *Inventario de Resiliencia (IRES)* mediante algunos procedimientos exploratorios y confirmatorios. Para ello, se colectaron datos de dos muestras independientes de cuidadores familiares de adultos mayores en la ciudad de Hermosillo, México: la primera con 125 cuidadores de 19 a 73 años (M_{edad} = 47.8, *DE* = 12) para los análisis factoriales exploratorios; y la segunda con 160 cuidadores de 19 a 82 años (M_{edad} = 48.7, *DE* = 13) para los análisis factoriales confirmatorios. Los análisis revelaron dos dimensiones claras y robustas estadísticamente en el IRES con 12 ítems: la resiliencia instrumental y la resiliencia emocional. En conclusión, la presente investigación muestra que el IRES es un instrumento válido para la medición de la resiliencia en una población mexicana de cuidadores familiares de adultos mayores.
Palabras clave: resiliencia, cuidadores familiares, adultos mayores, validación.

Psychometric properties of a resilience scale in family caregivers of older adults

Abstract

Caring for an elder relative has been studied not only as a stress generating circumstance and a loss of well-being for the caregiver but also, from the perspective of positive psychology, as the study of caregivers' dispositions to respond to difficulties experienced in a resilient manner. The aim of this study was to test the construct validity of a resilience inventory employing exploratory and confirmatory procedures. To that end, data were collected from two independent samples of family caregivers of older adults in the city of Hermosillo, Mexico: 125 caregivers aged 19 to 73 years (M_{age} = 47.8, *SD* = 12) to perform exploratory factor analyses and 160 caregivers aged 19 to 82 years (M_{age} = 48.7, *SD* = 13) to conduct confirmatory factor analyses. The analyses revealed two clear and statistically robust dimensions in the RESI with 12 items: instrumental resilience and emotional resilience. This study shows that RESI is a valid instrument to assess resilience in a Mexican population of family caregivers of older adults.
Keywords: resilience, family caregivers, older adults, validity.

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Introduction

Within the geriatric and gerontological research, the role of family caregivers has gained increasing importance, because they devote most part of the day-to-day assistance to actions provided to non-institutionalized older adults. Unfortunately, during the consolidation of caregiver studies, a trend has been reproduced, also generally found in psychology, of placing greater emphasis on psychopathology (anxiety, depression, stress, overburden) and less on what actually implies mental health. Accordingly, current knowledge of the positive aspects of the care activity is highly limited (Autio & Rissanen, 2018; Bangerter, Griffin, & Dunlay, 2018).

Positive psychology is a perspective which raises the need to understand those conditions, processes, and mechanisms to boost the maximum capacity of individuals (Castro, 2012; Pawelski, 2016); its application in studies on caregivers may enrich the understanding of those aspects that enable the psychosocial adjustment of individuals in their capacity as caregivers (Stansfeld et al., 2017). Resilience is one of the most interesting attributes in positive psychology, since it is perhaps the best representative of the capabilities or human processes to successfully adapt to adverse or traumatic situations and overcome them quickly (Southwick, Pietrzak, Tsai, & Krystal, 2015; Ungar, 2018).

In general, resilience has been defined as the good adaptation under strenuous circumstances, or as the success in achieving developmental tasks in the presence of serious challenges (Masten & Cicchetti, 2016). Adverse situations are the psychosocial risk factors which may impact the psychological development of human beings, such as poverty, illness, or exposure to stress conditions (Bell, 2017). "Good adaptation" may be operationally defined through indicators in connection with functional competency in specific developmental domains, which imply behavioral achievements expected in specific areas (Garmezy & Devine, 1984; Masten & Tellegen, 2012).

Resilience is a complex construct which, to be inferred, requires three conditions: first, the existence of a risk in the person's psychological development; second, the assessment of the psychological dispositions enabling behaviors to overcome risks, and third, it is an adaptive competence according to age and the culture the person belongs to (Gaxiola et al., 2011).

In the first place, there is no resilience without any risk to overcome; first, it is necessary to specify the risks people present in their development. A risk factor is defined as any condition linked to a high probability of occurrence of an adverse event, that is, of impacting health (Nexoe, Halvorsen, & Kristiansen, 2007). To be a caregiver of an older adult means to generate potential risks for the development of the individual since it has been widely documented that care activities create high demands scarcely met through supportive resources, where it is common to observe anxiety, depression, fatigue, loneliness and different indicators of general deterioration of the physical and emotional status, as well as the quality of life of a person assuming the role of caregiver (Domínguez-Guedea et al., 2011; Dias et al., 2016; Fernández-Lansac & Crespo, 2011).

The second requirement to infer resilience consists of having a set of psychological dispositions, understanding the latter as interaction trends related to typical social circumstances (Ribes, 1990). Such conceptualization offers the opportunity to locate resilience out of the mentalist structures or personality features and establish it as a probabilistic and objective natural phenomenon, starting from the historical and present interactions of the individuals with their environment. Within the framework of empirical research, Gaxiola et al. (2011) identified ten dispositional dimensions related to resilience, namely: positive attitude, sense of humor, perseverance, religiousness, self-efficacy, optimism, goal orientation, empathy, flexibility and coping. In that regard, the dispositional variables may be assessed through observation or self-report of those under study, since they are common individual characteristics with effects in day-to-day behaviors.

The third requirement to infer resilience consists of electing a measurement of competence in accordance with the age and culture of the persons; furthermore, the action shall satisfy at least one success of a behavior usually affected by the risk conditions selected (Masten & Tellegen, 2012; Ungar, 2019).

Resilience has been assessed according to the performance of the persons under risk in the labor context (Shatté, Perlman, Smith, & Lynch, 2017; Yildiz, 2019), school (Mwangi, Ireri, & Mwaniki, 2017; Taylor, Minich, Schluchter, Espy, & Klein, 2019), behavioral adjustment (Sint Nicolaas et al., 2016), psychosocial adjustment (Lan & Wang, 2019; Sanjuan-Meza, Landeros-Olvera, & Cossio-Torres, 2018), and physical health (Ghanei Gheshlagh et al., 2016; Seiler & Jenewein, 2019), so the domains where resilience is assessed change according to development. For instance, the measurements of resilience in adult youth may show higher than average performance scores in the domains of development of the profession, in social relationships and physical well-being (Tusaie & Dyer, 2004).

The study of resilience in family caregivers of older adults is still in a pioneer stage since only a few studies are addressing how the caregiver may resist "the stress she/he is submitted to and the opportunity for their personal development" (Fernández-Lansac & Crespo, 2011, p.22).

A contradiction has occurred by assuming mental health condition status based on measurements of psychopathological indicators (Borsje et al., 2016, Chan et al., 2016; Machisa, Christofides, & Jewkes, 2018); hence, there is less knowledge of the positive aspects of the care duty. There are hardly any works studying the overburden and depression of caregivers in juxtaposition with positive psychological variables, such as resilience (Jones, Killett, & Mioshi, 2019a; Mulud & McCarthy, 2017; Palacio, Krikorian, & Limonero, 2018). Resilience may be related to the subjective well-being (Domínguez-Guedea et al., 2011; Joling et al., 2016), to the direct and reassessed coping in the face of problems (Cerquera, Pabón, & Ruíz, 2017; Valadez-Roque, Martín del Campo-Arias, & Hernández-Arenas, 2017), in addition to the use of social support resources (Crespo & Fernández-Lansac, 2015; Jones, Woodward, & Mioshi, 2019b; Ong et al., 2018).

In view of the need to enrich the body of knowledge on resilience in persons who take care of their older relatives with health problems, this study is aimed to performing the construct validation of the Resilience Inventory – RESI in family caregivers of older adults in the city of Hermosillo, Sonora, Mexico. The instrument to be analyzed was originally designed and validated in a population of housewives under risk of violence (Gaxiola et al., 2011), being an instrument which enables its application and verification of the factorial structure in other populations also exposed to risks in their development, such as family caregivers. To that end, this study reports the construct validation through exploratory and confirmatory procedures.

Method

Type of study

Cross-sectional, empirical, quantitative, instrumental type study, since data from the participants were collected and analyzed in a particular period of time and also the psychometric properties of the instrument were adapted and studied (Montero & León, 2007).

Participants

Through a non-probabilistic convenience sampling, data were collected of two separate samples of persons acting as caregivers of a functional dependent older adult. Sample 1 consisted of 125 cases to perform exploratory factor analyses and, sample 2 was made up of 160 cases to develop confirmatory factor analyses. The size of the first sample was determined by psychometric criteria suggesting five to ten participants per each item that would be included (Treiblmaier & Filzmoser, 2010), whereas the size of the second sample was estimated with ten to twenty cases per parameter (Kline, 2016). Accordingly, 6.2 cases were estimated per item for the first sample, in connection with 20 variables to analyze in exploratory procedures; in the case of confirmatory analyses, approximately 15 parameters were estimated.

The inclusion criteria in both samples were: to be a relative of an older adult and provide assistance in at least one of the activities indicated in the checklist of basic and instrumental activities described in the instrument section. The cases where the family caregivers received some economic compensation for the performance of their care duties were excluded. The cases where 80% or more data were missing in the items of the set of instruments applied were eliminated. The characterization of each sample of caregivers is presented below:

- Sample 1: Most of the caregivers (92.5%) and older adults care recipients (70.6%) (70.6%) were women. The ages of the caregivers varied from 19 to 73 years ($M = 47.8$, $SD = 12$) and the ages of the older adults receiving such care varied from 60 to 102 years ($M = 77.5$, $SD = 8.8$). Most of the caregivers were sons/daughters of the older adult (73.1%), followed by grandchildren (8.1%) and spouses (7.5%), whereas 11.3% had some other type of relationship, such as brothers/sisters, nephews/nieces, daughters in law, etc. With respect to educational level, 24% had completed the highest grade of elementary school, 21.4%, junior high school, 33.2%, high school and 21.4%, college or post graduate studies.
- Sample 2: The characteristics of this sample were similar to those of the first sample: (a) most of the caregivers (86.5%) and older adults care recipients (73.6%) were women; (b) the ages of the caregivers varied from 19 to 82 years ($M = 48.7$, $SD = 13$) and those of the older adults varied from 60 to 102 years ($M = 78.35$, $SD = 8.8$); (c) 75.7% of the participants were sons (daughters) of the older adults, 7.4%, spouses, 5.9 % grandsons and granddaughters and 11% had some other type of relationship (brothers, nephews and others); (d) with respect to educational level, 20.3% had completed elementary school, 13.5%, junior high school, 33.8%, high school and 32.4% had gone through college or graduate school.

Instruments

A questionnaire of socio-demographic data was applied with questions on sex, age, family composition, relationship

with the caregiver, education of the caregiver and earnings of the caregiver and of the older adult receiving such care.

In order to identify whether the potential participant met the inclusion requirement consisting of providing assistance to older adults, a checklist of 23 basic and instrumental activities of daily living was applied, where an older adult may require assistance, such as bathing, going up and down stairs, dressing/undressing; examples of instrumental activities include: cooking their own food, going shopping, managing their own money, moving around town. Such activities were taken from the Barthel Index (Mahoney & Barthel, 1965) and the Instrumental Activities of Daily Living Scale (Lawton & Brody, 1969) since they are widely used instruments, both nationally and internationally, as part of the comprehensive geriatric assessment (Cano-Gutiérrez, Borda, Reyes-Ortíz, Arciniegas, & Samper-Ternent, 2017; Centro Nacional de Excelencia Tecnológica en Salud, 2018; Flores, Cruz, González, López, & Abizanda, 2014). It is worth mentioning that it was not the original format of those scales which was applied, and the intention was not to analyze the functionality of the older person receiving care; we only listed the activities to ask whether the caregiver assisted their older relative in one or more of them. When a caregiver responded that he was the provider of assistance in any of the items, it was then assumed that the inclusion criteria of the sample had been satisfied.

The instrument to be validated with family caregivers of older adults was the Resilience Inventory – RESI, originally designed and validated by Gaxiola et al. (2011) in a population of mothers with elementary school children. The version used consisted of 20 items grouped in the following factors: positive attitude (four items; $\alpha = .81$), sense of humor (two items; $\alpha = .65$), perseverance (two items, $\alpha = .71$), religiousness (two items; $\alpha = .95$), self-efficacy (two items: $\alpha = .83$), optimism (two items; $\alpha = .73$), coping (four items; $\alpha = .68$) and goal orientation (two items; $\alpha = .81$). The total internal consistency result of the instrument is represented in a value $\alpha = .93$.

RESI instructions ask the respondent to indicate the frequency with which he had felt, thought or responded as indicated by the items, in the last month. Response options in *Likert* -type format of four points were applied (1 = never, 2 = a few times, 3 = many times, 4 = always), in contrast to the original document which used five response options: nothing (1) to completely (5). Furthermore, three light adjustments were made to the grammatical structure of several items. Both modifications attended the need to simplify the stimuli through which caregivers would express their resilience level

Procedure

The sample was contacted through organizations providing older adult services and through personal acquaintances. For the first form of contact, health units of first, second and third level of care were used (community clinics, general hospitals, and mental health centers), as well as civil society organizations and community religious groups. The general project from which this study is derived was presented. Ethical considerations of the research were analyzed where there was a formally established ethics committee and collaboration agreements were reached between the research team and the authorities of the different organizations. After the approval from the authorities, relatives of the older adults who received such care were contacted. The aims of the project and the general approach were explained through a Letter of Consent, inviting them to participate voluntarily.

Home visits were programmed with the caregivers who agreed to take part in the study in order to collect the total information. Since together with the instruments of this study, others were applied as part of the general research project leading to the present study, two to five sessions for each participant were necessary, with an average of one-hour duration each. The socio-demographic data and the checklist on basic and instrumental activities where the persons receiving care required assistance were collected through a structured interview. The RESI Inventory was responded in an average of 10 minutes, either independently, by caregivers who preferred it, or assisted by the interviewer by those who requested it.

Data Analysis

The statistical package SPSS Statistics 19 was used for descriptive and exploratory factor analyses; the Winsteps 3.75 program was used to conduct the Rasch analysis, and the EQS 6.1 for the confirmatory factor analysis of the instrument to be validated.

The sequence of the analysis was as follows: 1) frequency analysis to identify missing values, proceeding to replace it with the mode value in the identified cases; 2) descriptive statistics including mean, standard deviation and asymmetry to observe any abnomality in the distribution; 3) review of the tolerance values to identify possible multicollinearity among items; 4) Rasch analysis for the whole set of items of the instrument to be validated, observing affinity values (logits), internal and external fits, Point biserial correlation and discrimination value; 5) factorability of the data matrix through the Kaiser-Meyer-Olkin (KMO) test, Barlett´s sphericity test and the Determinant value of the matrix;

6) Horn´s parallel analysis to know the optimum number of factors to be retained; 7) exploratory factor analysis with the factorization method of principal axis and the oblique rotation method; 8) confirmatory factor analysis through structural equations, considering as the goodness of fit indicators of the model the ratio $x^2/df/\leq 3$, a value of the comparative fit index (CFI) ≥.95 (Schermelleh-Engel, Moosbrugger, & Müller, 2003), a value of the standardized root mean squared residual (SRMR) <.08 and a value of the root mean square error of approximation (RMSEA) <.06 (Hu & Bentler, 1999). A significance level of $p \leq .05$ was established. The Cronbach´s alpha coefficient (Nunnally & Bernstein, 1994) was used to determine the reliability of the instrument.

Ethical Aspects

This study was conducted in accordance with the Ethical Principles and the Code of Conduct for Psychologists of the American Psychological Association (2017). The protocol of the project which led to this article was assessed and approved by the Committee of Bioethics in Research, Department of Medicine and Health Sciences of the University of Sonora (approval folio: DCMCS/CBIMCS/D-1).

Results

Sample 1: Exploratory validation analysis

Originally, the missing values percentage for each one of the items was checked, identifying that most of the missing data pertained to five cases in one item (4% of the total sample) and one case in a different item (.8% of the total sample, hence, the base showed no serious problems in that sense; the few missing data were replaced by the mode value of the distribution). With respect to the irregularity in the distributions, it was detected that the item "I was able to face the situations of my life, no matter how difficult they were" was strongly biased, given its asymmetry value of -1.4, so it was decided to remove it from further analysis. Furthermore, the multicollinearity inspection revealed that the item "My religious beliefs gave sense to my life" showed a tolerance value of .243, referring a very high squared multiple correlation and potentially destabilizing the whole set of data, reason why it was removed from subsequent procedures.

Next, a Rasch analysis was applied for the 18 remaining items, in order to verify the precision of the items, since, as mentioned in the instrument section, at least four of the eight RESI factors show a low internal consistency value (≤.73), whereas the total scale reveals a highly satisfactory Cronbach´s alpha value (.93). Such circumstance forced to verify the contribution of the set of items, not only in a scale formed by eight factors but in terms of a global resilience measure. Results show a satisfactory internal and external fit in most of the items submitted; notwithstanding, the items "I looked for support of others when I needed their help" and "I thought the future would be better than the current time" showed infit and outfit values of ≥1.63, a very low discrimination power (.25) and a deficient biserial point correlation (≤.38), compared to the rest of the items; both items were eliminated from further analyses.

The following indicators were obtained to determine the factorability of the data matrix: a) a value of .82 in the KMO test; b) a value of .001 as a determinant of the matrix and; c) a value of $X^2 = 691.283$, $p \leq .000$ in the Bartlett´s sphericity tests. With the above evidence, it was concluded that the data matrix is factorizable, so it was proceeded to carry out the corresponding analyses in order to assess the psychometric properties of the resilience measure in caregivers.

A parallel analysis was performed comparing the original values of the principal components with the values obtained from a database with random data. The contrast of random data with respect to those of the study containing 16 variables and 125 cases revealed the relevance of removing two factors at the most. Next, factor analyses by principal axis were performed, removing two factors which explain 54% of the variance of the resilience construct in a theoretically coherent manner including satisfactory psychometric properties. The Promax rotation was used, given the high correlation between the two factors.

Of the 16 items submitted to analysis, only 13 reached factor saturation ≥.35; these were grouped in two factors with adequate internal consistency, even for the total reliability of the instrument. The first factor in the inventory integrates items related to actions to reach desirable results, overcome difficulties, reinterpret problems as a contributing experience, in addition to a positive expectation with respect to the capability to obtain what one wishes, where all these items pertain to self-efficacy, persistence, goal orientation, resolution coping and positive attitude indicators. That factor was named *Instrumental Resilience*, because it reflects specific behaviors and actions of the caregiver to adapt to hardship. The second component of the factorial structure was named *Emotional Resilience*, because it includes items indicating an emotional disposition characterized by a positive attitude, sense of humor and religious attachment to overcome difficulties. According to the Cronbach´s alpha value, the internal consistency of the first factor was .84 and the second, .83. The consistency of the total scale was .88, recording a correlation coefficient between factors of .48.

To complete the review of the psychometric properties of the set of items composing the solution of two factors, Rasch analysis was applied once again for the items of each factor and the results appear in Table 1. The affinity values show a wide range of the set of items to capture the attribute, within which, the item "I was happy despite my problems" assumes a greater sensitivity in relation to the Emotional resilience with respect to the rest of the items of this factor, since the 1.02 value represents at least a one logit difference compared to the other items composing the scale. As the main result of this analysis, it was found that all the items show satisfactory internal and external fit values (.5 to 1.5) for perception scales and that the biserial point correlation coefficient in each one is either acceptable or moderate. Furthermore, the empirical discrimination of the two items is indicated, describing the strength with which they distinguish the people who really have the attribute; where 1 is the expected value, the levels of most of the items are good and a couple of cases are considered acceptable.

Sample 2: Analysis of confirmatory validation

The analyses applied to the participants' answers in the second sample were performed to examine the structure of two factors as components of the family caregiver resilience. To that end, confirmatory factor analyses were run by using structural equations, considering, as observed variables, the raw scores of each item showing appropriateness in the exploratory analyses and, as latent variables, the factors they pertain to. It is worth mentioning that in the process of this analysis it was identified that the measurement error of the item "My religious beliefs gave sense to my life" established an elevated covariance with the item "My religious faith helped overcome my problems", situation which seemed comprehensible given the similarity of the item´s content. It was decided to remove the first of those two items given its lower regression value (weight). Such procedure allowed to observe the favorable fit of the model, without the need to carry out any other modification. The final model appears in Figure 1.

This analysis revealed a structure which was consistent with the structure found in the exploratory validation, establishing significant regression coefficients for each item with respect to their latent variable; the estimated model showed acceptable fit levels, reaffirming the validity of the measure. The final results showed no negative variances or correlation values ±1, suggesting the suitability of the model´s calculation; also, the critical value of the sample size was 144, with a significance level of .001, securing the appropriateness of the number of cases used for this analysis SRMR = .053; RMSEA = .055 [.027, .080]; X^2/df = 78.814/53, p = .012; CFI = .952.

Table 1.

Exploratory factor analysis by principal axis factoring with Promax rotation, Rasch analysis values, and descriptive statistics for 13 RESI items in family caregivers (n = 125)

Item contents	F1	F2	h²	Affinity (logits)	Internal fit	External fit	rPbis	DISCR	M	SD	Asymmetry
I had goals and expectations in life	.861		.61	-0.53	0.93	0.86	.72	1.13	3.36	.723	-.799
I struggled to obtain what I wished	.795		.63	-0.09	0.79	0.82	.77	1.24	3.26	.772	-.692
I looked for persons with whom I could learn	.726		.49	0.26	1.11	1.13	.70	0.90	3.23	.834	-.884
I faced my problems immediately	.713		.48	0.79	1.04	1.10	.67	0.92	3.37	.690	-.634
I tried to learn something positive, including problems I faced	.661		.51	-0.20	0.99	0.99	.71	1.03	3.30	.698	-.786
I felt I could solve or overcome my life problems	.576		.53	-0.66	0.98	1.02	.68	1.00	3.42	.688	-.923
Problems were a challenge for me	.471		.35	0.44	1.16	1.14	.62	0.77	3.43	.639	-.682
My religious faith helped me overcome my problems		.952	.75	-0.10	0.86	0.78	.75	1.17	3.31	.911	-1.05
My religious beliefs gave sense to my life		.902	.70	-0.13	0.89	0.79	.73	1.12	3.33	.905	-1.09
I was happy, despite my problems		.655	.53	1.02	0.91	0.97	.73	1.11	3.22	.694	-.332
I was able to smile, despite my problems		.632	.58	-0.52	0.89	0.98	.73	1.09	3.35	.755	-1.02
I kept my sense of humor even in hardship		.563	.46	0.28	1.14	1.12	.71	0.84	3.06	.830	-.550
I saw life and things which occurred as positive		.350	.38	-0.55	1.25	1.24	.64	0.68	3.15	.718	-.370

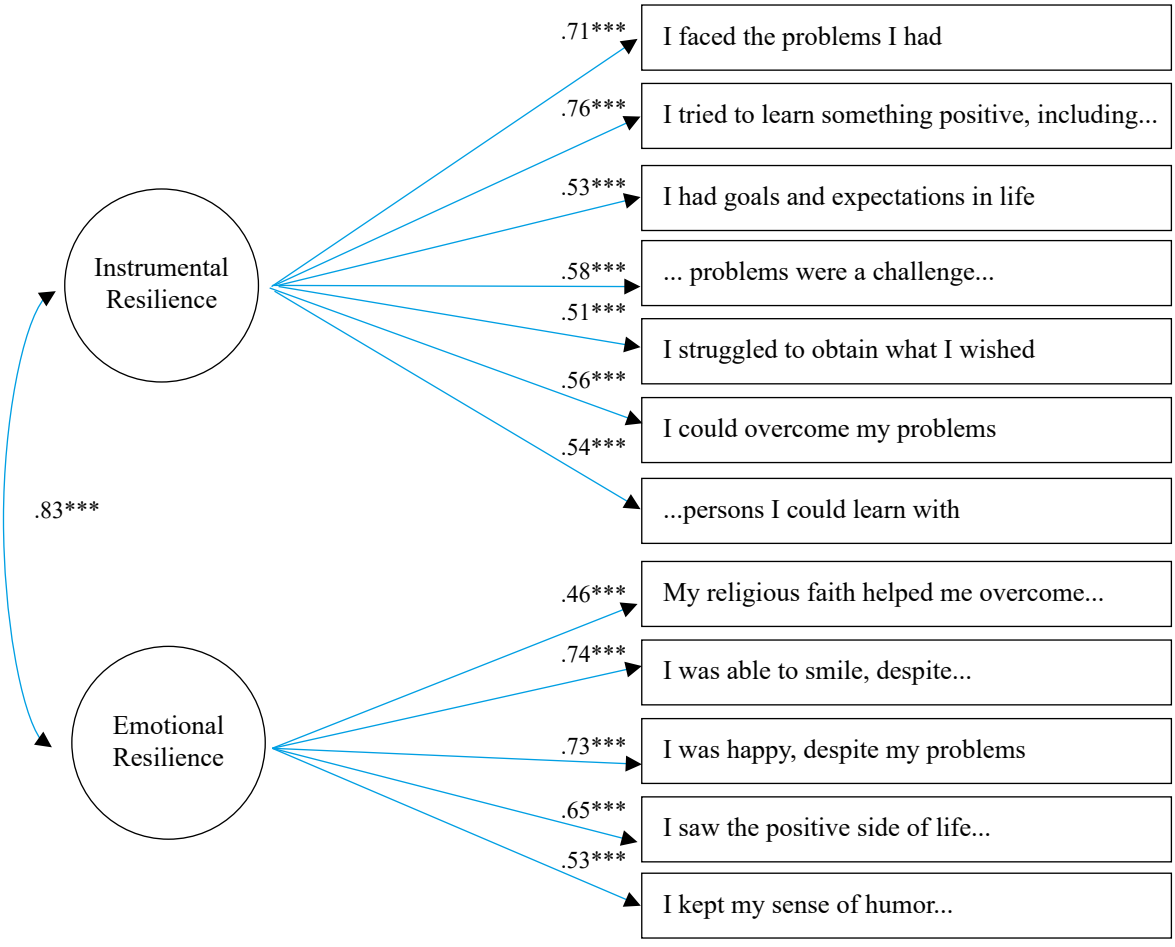

Figure 1. Model of the confirmatory factor analysis of the RESI structure in family caregivers (n = 160)
Note. *** $p < .001$

Discussion

The study of resilience has faced conceptual problems which have resulted in methodological problems when those were addressed; hence, conceptual alternatives are required to clarify their assessment. The proposal is that resilience may stop being a concept related to the absence of psychopathology to become a phenomenon implying the expression of competence or adaptive behavior.

The aim of this study was to perform a construct validation of the Resilience Inventory in a sample of family caregivers of older adults. The results of the exploratory and confirmatory analyses were highly satisfactory and provide evidence of the RESI's validity and reliability, revealing two factors: *Instrumental resilience* and *Emotional resilience.* This can be demonstrated by having obtained a Cronbach´s alpha coefficient of >.80 both for full reliability and per factor and the report of the goodness of fit tests for the proposed model: the quotient of x^2 between the degrees of freedom was 1.49 versus higher than 3, a RMSEA value of <.06 (for a 90% confidence interval, a lower limit <.05 and an upper limit not exceeding .08), an SRMR value <.08 and a CFI value ≥.95.

Gaxiola et al. (2011) originally studied RESI's validity in a population of mothers with elementary school children, in contrast with the present study which included from young adults to adults over 70.

The original dimensions of the RESI, *Coping, Perseverance, Self-efficacy* and *Goal Orientation* contain items grouped in the *Instrumental Resilience* factor. The dimensions *Positive Attitude, Sense of humor* and *Religiousness* contain items grouped specifically in the *Emotional Resilience* factor, except for the items "I try to learn something positive, including the problems I face"

and "I try to be with persons where I can learn something positive", which were more clearly explained with the *Instrumental Resilience* factor.

Compared to other studies that applied resilience scales validated in a non-caregiver population, Cerquera et al. (2017) obtained an internal consistency slightly acceptable (.79), while Jones et al. (2019b) found a hardly acceptable internal consistency (of almost .70). In both studies, the Cronbach´s alpha coefficient was lower than the RESI.

Compared to other validation studies in caregivers, in the one performed by Crespo, Fernández-Lansac, & Soberón (2014), who used the Connor-Davidson´s Resilience Scale (CD-RISC), the internal consistency values for the factor *Coping and perseverance*, with items such as "I am able to face anything", were similar, in comparison to the *Instrumental Resilience* of this study, with items such as "I faced problems immediately".

Maneewat, Lertmaharit, & Tangwongchai (2016) used the Caregiver Resilience Scale (CRS), which is composed of five specific dimensions related to the competences of the caregiver: *Physical competence, Relationship competence, Emotional competence, Cognitive competence* and *Spiritual Competence*; notwithstanding the fact that no confirmatory analyses were performed, it has a similar total internal consistency (.87 compared to .88 of the RESI). Furthermore, Perrin et al. (2018) examined the Adult Resilience Scale (RSA) in populations of Argentina and Mexico, with four factors: *Social support, Personal competence, Family coherence* and *Social Competence*, which showed a higher Cronbach´s alpha than the RESI, .94; however, the size of the Mexican sample was smaller because it pertained to 20 participants, including not only the family caregivers, but also, professionals and friends.

Instrumental and emotional resilience are two useful resources for caregivers, since they address their duty toward desired goals and perseverant actions (Maneewat, Lertmaharit, & Tangwongchai, 2016), They also led their emotions toward optimism and positive attitude (strength and self-confidence in the RESI-M with minor caregivers in the Toledano-Toledano´s version, 2019). They are consistent with the literature on resilience, with the added characteristic that they also summarize it.

One of the RESI´s strengths with respect to other recently validated instruments is that in Mexico, only one other scientific report of a resilience scale validated in a population of older adult caregivers (Perrin et al., 2018) has been found, thus contributing to filling a methodological gap in Mexican research on caregivers, which is scarce itself. In that sense, and in accordance with Ungar (2019), the validation of resilience measures is necessary because depending on the social context where such attribute is assessed, the results show the idiosyncratic nature of the local culture. Another contribution is that none of the studies identified by the authors on family adult caregivers had applied a resilience scale submitted to Rasch´s model. The reduction of the RESI to 12 items suggests its brief administration by other researchers.

This study has certain limitations: first, it was not possible to identify the sensitivity of the change of life of the participants throughout time by means of the RESI´s test-retest reliability, given the cross-sectional design. Second, the RESI was not compared with other instruments which assess constructs related to resilience (self-efficacy, subjective well-being, optimism) in order to assess convergent validity, nor with instruments showing psychopathology indicators (depression and overburden) to assess divergent validity.

It is suggested that, in future studies, the scale used in this study to assess resilience be analyzed longitudinally as for differences by sex and be compared in terms of efficacy with the tools available for adult population in Mexico.

In short, the present study confirmed the construct validity of a resilience instrument for family caregivers of older adults. The RESI has appropiate psychometric properties for its use at community level.

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