Factorial structure Scale Zarit Burden Interview in caregivers of patients with stroke

Estrutura fatorial da Escala Zarit Burden Interview em cuidadores de pacientes com acidente vascular encefálico

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RESUMO

Este artigo objetiva verificar a validade de constructo, confiabilidade, a validade convergente e discriminatória e a consistência interna do modelo Pentadimensional da Escala Zarit Burden Interview. Trata-se de um estudo metodológico realizado com 136 cuidadores informais de paciente com sequela de acidente vascular encefálico, no período de abril a junho de 2013 em João Pessoa-PB. Para análise dos dados, realizou-se o Alfa de Cronbach, análise fatorial confirmatória, a confiabilidade composta e a variância média extraída. Os resultados da validação de constructo evidenciaram indicadores de ajuste melhores do que a versão o modelo unidimensional. O alfa de Cronbach para o total da escala foi 0,80, a confiabilidade composta e a variância média extraída apresentaram valores estatisticamente significativos. Por fim, a análise fatorial confirmatória evidenciou a estrutura fatorial hierárquica como mais adequado para medir a sobrecarga de cuidadores de pacientes com acidentes vascular encefálico. O modelo Pentadimensional da Escala Zarit Burden Interview mostrou-se válido e confiável.

Palavras-chave: Psicometria; Acidente vascular cerebral; Cuidadores.

ABSTRACT

This article aims to verify the construct validity, reliability, convergent and discriminant validity and internal consistency of the five-dimensional model of the Zarit Burden Interview Scale. This is a methodological study was conducted with 136 informal caregivers of patients with stroke sequelae, in the period April-June 2013 in the city of João Pessoa-PB. For data analysis, the Cronbach's alpha was conducted confirmatory factor analysis, composite reliability and average variance extracted. The construct validity of the results of the theoretical model of five factors conducted showed better adjustment indicators than the version the one-dimensional model. The Cronbach's alpha for the total scale was 0.80, the composite reliability and average variance extracted statistically significant values. Finally, the confirmatory factor analysis showed the hierarchical factor as a more suitable for measuring the overload of caregivers of patients with stroke, considering both the size of the construct as indexing of the items and their respective factor. The five-dimensional model of the Zarit Burden Interview Scale proved to be valid and reliable.

Keywords: Psychometrics; Stroke; Caregivers.

NOTA

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INTRODUCTION

Stroke is the most common cause of severe disability resulting from changes in mobility, behavior, mood, cognition, speech and sensory loss. Physical and cognitive-behavioral sequelae compromise the functional capacity of the individual, often resulting in loss of independence and autonomy and also often requiring assistance in activities of daily living [1].

When returning to the home, the care provided to the patient with a stroke sequel is usually performed by a family member, called an informal caregiver, who is almost always unprepared for the challenges of caring for a person with limitations to perform simple activities[2]. In this context, the requirement to provide care increases the risk of caregivers neglecting their own health, which can result in physical, social and financial physical overload[3].

The concept of overload is not a recent one, being used since 1946, referring to the consequences in those who are in close contact with a psychiatric patient, severely disturbed, the English Literature denominates the term by means of the nomenclature burden. The discussions were initially directed at the accumulated overload in the families of patients treated at home and, more recently, by the family unit as a care subject[4].

However, it was only in 1985 that Platt presented a more elaborate definition of this overload, relating it to the presence of adverse events that affect the lives of family members5. It can be objective and subjective. Objective overload refers to the requirement of care provided by the severity and type of the patient's dependence and behavior, the consequences or impact on the various dimensions of the caregiver's life, while the subjective overload is related to the psychological consequences to the family[4].

Although there is no consensus regarding the concept of overload, this definition has been seen as a multidimensional construct that covers the biopsychosocial sphere, being influenced by factors such as: time available for care, financial resources, psychological, physical and social conditions, attributions and distribution[6-7], making it necessary to administer a measure that evaluates the overload. There are several instruments of measures on the subject[8], among them the Zarit Burden Interview Scale (ZBI), elaborated by Zarit[9], composed of 22 items and validated for Brazil by Taub[10].

Originally, ZBI was developed in 1980 containing 29 items, designed to assess the subjective overload experienced by informal caregivers[9]. A few years later, the scale was reduced to 22 items[11] and in 1991 the 22 item version was produced with two factors, subjective overload and objective overload[12]. While the first version was scored using a Likert scale.

The "loss of control" factor encompasses the expectations that the caregiver has regarding caring, regarding the future, his / her abilities to care, financial resources and so on. The "sacrifice" factor intends to evaluate the impact on the caregiver, associated to the care delivery, in terms of privacy, health, social limitation. The third dependence factor reflects the relationship of dependence of the patient with the caregiver. The fourth "Fear / Anguish" factor reflects the implications on the relationship between caregiver and patient. The fifth "Self-criticism" factor is aimed at assessing the caregiver's perception of self-efficacy, that is, the perception about the performance of his role.

The items that were in different factors in the structure used in the above studies were items, 7, 8, 9, 14 and 18.

Subsequently, several attempts to find latent dimensions of the ZBI were made, among them, two validation studies were carried out in China and Portugal[13-14] in which 5 factors were identified through the construct validity of 21 items of scale: loss of control, sacrifice, dependence, fear/anguish and self-criticism, item 22 being excluded due to its generality.

One aspect of great relevance in factorization is the distribution of items in the different factors that make up the scale, since each factor represents a sub-construct to be evaluated. In this perspective, it is observed that the distribution of some items-factor of the structure used in the study of Ferreira et al.[14], diverged from the study by Lu et al.[13], a condition that can be justified by the semantic difference between the two countries. Such divergences may result in a misjudgment of the factors related to overburden in different societies. Thus, we observed in this study the need for an analysis both semantic and content representativeness in relation to the distribution of items in the respective factors to avoid biases related to linguistics.

Currently in Brazil, the ZBI uniforms scale is one of the most used in the studies that evaluate the caregiver overload. In this perspective, the motivation to verify through psychometric tests the reliability of the 5-D version of ZBI, as well as to verify which version allows a more accurate evaluation of the caregiver overload, in order to plan more appropriate, specific and individualized interventions that minimize the negative impact of the process of caring for a patient with a stroke sequel.

In view of the above, the following objectives can be highlighted: Verify the construct validity, reliability, convergent and discriminatory validity of the Zarit Burden Interview ZBI Pentadimensional version and compare it to the unifatorial version. In order to do so, the statistical technique of structural modeling analysis will be used in this study, which has the advantage of taking into account, the theory, to define the items belonging to each factor, as well as to present indicators of goodness of fit

that allow to decide objectively on the construct validity of the evaluated measure.

METHOD

The study population were caregivers of patients with sequelae of stroke. Inclusion criteria for caregivers included: age equal to or greater than 18 years and being the primary caregiver. The sample consisted of 136 caregivers.

This sample was calculated in the statistical package G Power 3.1; it is a software designed to calculate statistical power (ie, the hypothesis test), based not only on the 'n' required for the research, but also on the type of calculation to be performed (15).). For the data collection of this study, considering a probability of 95% (p <0.05), magnitude of the sample effect (r □ 0.30) and a hypothetical power pattern (π ³ 0,80); (n = 136 subjects) was sufficient for the present study (having as indicators: t ³ 1.98, π ³ 0.93, p <0.05).

The Brazilian version (10) consists of 22 items, with a score varying from 1 to 5, and obeys the following scores: intense overload (score between 61 and 88), moderate to severe overload (scores between 41 and 60), overload moderate to mild (scores between 21 and 40) and absence of overload (scores below 21).

The ZBI scale was applied to caregivers of patients with stroke from April to June 2013. Prior contact was made with the Health Districts of the city of João Pessoa-PB Brazil, to authorize the research, after release and approval of the Ethics Committee. At the first moment, a random selection was carried out with an average of 40 Family Health Units, in which the supporters and nurses of each Unit were contacted, who reported through the records, the patients who suffered from stroke and had a sequel. Data collection was started in the patients' homes, followed by a health agent.

In order to meet the objectives of the study, in the year 2015, an initial assessment was made of the theoretical dimension, that is, the adequacy of each item to the five factors presented in the ZBI pentadimensional version of the studies of Ferreira et al.), and by Lu et al.[13] by four Brazilian judges. This procedure was necessary due to the differences in item-factor distribution that the cited studies presented, in addition to the cultural differences between Brazil and the countries that were studied. The judges were selected through the curriculum lattes based on their experience in the subject, and personally contacted to respond to an instrument built by the researcher. The existing divergences were made through the Delphi technique[16], until they reached a consensus.

After structuring a new factorial version of the ZBI pentadimensional scale, psychometric tests were performed to analyze and compare the pentadimensional versions proposed by Ferreira et al. [14], and by Lu et al. [13] by four brazilian judges.

In the analysis of the data, the statistical package SPSS for Windows, version 21.0 was used in order to perform descriptive analysis and the Cronbach's Alpha in order to ascertain the internal consistency of the scale. The factor analysis was performed through AMOS GRAFICS 21.0. This type of analysis is adequate to verify if a given factor structure is adequate to the data, since it allows: (a) specification and comparison of theoretically relevant models and (b) first and second orders. The following adjustment indicators were considered[17-18].

The covariance matrix was considered as input, and the ML (Maximum Likelihood) was adopted. This analysis presents some indices that allow to evaluate the fit quality of the proposed model, such as[17,19-21].

• χ^2 (chi-square) tests the probability of the theoretical model to fit the data; the higher this value, the worse the adjustment. This has been little used in the literature, being more common to consider its ratio in relation to the degree of freedom (χ^2/g.l.). In this case, values up to 3 indicate an appropriate adjustment.

• *Average Square Residual Root (SRR)*, which indicates the adjustment of the theoretical model to the data, as the difference between the two approaches zero.

• *Comparative Fit Index (CFI)* compares, in general, the estimated model and the null model, considering values closer to one as indicators of satisfactory adjustment. That is, a score greater than 0.90 indicates that the intended model would best represent the construct to be confirmed.

· O *Tucker-Lewis Index* (TLI) compares, in general, the estimated model and the null model, considering values closer to one as indicators of satisfactory adjustment.

· *Goodness-of-Fit Index (GFI)* and *Adjusted Goodness-of-Fit Index (AGFI)* are analogous to R^2 in multiple regression. Therefore, they indicate the proportion of variance-covariance in the data explained by the model. These range from 0 to 1, with values at 0.80 and 0.90 or higher, indicating a satisfactory fit.

· *Root-Mean-Square Error of Approximation* (RMSEA), with its 90% confidence interval (IC90%), is considered an indicator of "badness" of adjustment, that is, high values indicate an unadjusted model. It is assumed that RMSEA should be between 0.05 and 0.08, accepting values up to 0.10.

· *The Expected Cross-Validation Index (ECVI)* and the *Consistent Akaike Information Criterion (CAIC)* are indicators commonly used to assess the suitability of a given model over another. Low ECVI and CAIC values express the best fit model.

Finally, it was tried to know evidences of construct

validity (convergent validity, discriminant validity and composite reliability). In this case, the extracted mean variance (VME) was calculated, which indicates how much the construct explains the set of items, being a value 0.50 indicative of convergent validity. If the square root of the VME of each factor is taken into account, comparing it with the correlation between the factor pairs (Φ), if its value is higher, discriminant validity is indicated. The composite reliability (CC) is a complementary indicator of measurement accuracy, where the value must be equal to or greater than 0.70 to attest to this parameter[22-23].

During the research, all ethical and legal aspects involving human beings, as recommended by Resolution No. 466/12, of the National Health Council were fulfilled. The project was sent to the Ethics Committee of the Health Sciences Center of the Federal University of Paraíba and approved under protocol no. 0279/13 and CAAE: 13778313.3.0000.5188. During the execution of the research, the principle of autonomy and privacy was respected, especially with regard to the Term of Free and Informed Consent, an indispensable instrument for conducting research involving human beings.

RESULTS

Table 1 shows the item-factor distribution of the ZBI pentadimensional scale version of the studies by Ferreira et al. [14], and by Lu et al. [14]. The items that are in divergent factors were: item 7, item 8, item 9, item 14 and item 18; verified these item-factor divergences in both studies. The last column of the table presents the factorial structure of the scale proposed by Brazilian judges, based on the theoretical and psychometric perspective of the measure.

Based on the evaluation of the item-factor distribution presented in Table 1, an analysis of the item breakdown was carried out with the purpose of starting from the assumptions of the Classical Theory of Tests, to verify if the items had the capacity to discriminate people with magnitudes close to, that is, to discriminate those from the lower and upper groups with respect to the measured construct[20].

Thus, as shown in Table 2, a total score of this instrument was calculated and then its median; the respondents with scores below the median were classified as being of the lower group, while those with scores above the median were defined as those of the upper group. For this, each of the items of this measure was considered, then the *t Test* for independent samples was calculated, comparing the two groups previously listed. From these tests it can be observed that all the items of the scale were able to discriminate people with magnitudes close (statistically significant difference). These items were retained in the scale, justifying themselves later in the factorial analysis.

Table 3 shows that the structure proposed by Brazilian judges presented the best psychometric indicators to assess the overload in caregivers; (Lambdas, λ) within the expected range | 0 - 1 |, statistically different from zero (t> 1) , 96, p <0.05).

In Table 4, it is possible to observe the results of the prediction estimates from the regression analysis for the original Zarit factorial organization, which identify the non-significant variables and with a criterion ratio lower than what is statistically required.

From these results, it was decided to evaluate the scale from a hierarchical structure based on Sequeira's[24] perspective, this author suggests that the evaluation of the overload should be considered as a second order factor, which are directing a multidimensional character and that contemplates the following factorial distribution: objective evaluation of the overload - sacrifice factor and dependence and the subjective evaluation of the overload - Loss of Control, Fear/Anguish and Self-criticism.

A estrutura multidimensional hierárquica, mostrou melhores resultados quando comparado aos mostrados na Tabela 4, apresentando os seguintes indicadores: c^2/gl = 1,38, RMR = 0,09, GFI = 0,92, AGFI = 0,90, CFI = 0,95, TLI = 0,93, RMSEA = 0,04, CAIC = 536,70 e ECVI = 2,63. Todas as saturações (Lambdas, λ) estiveram dentro do intervalo esperado |0 - 1|, condição que revela a não existência de problemas com a estimação que se pretendeu, com todas são estatisticamente diferentes de zero (t > 1,96, p < 0,05) garantindo a qualidade da validade estrutural. Vale destacar que, tendo como resultado adicional, observou-se que os alfas de *Cronbach* geral de 0,80, oscilando de 0,78 a 0,79, quando na exclusão de item nos fatores.

The hierarchical multidimensional structure showed better results when compared to those shown in Table 4, with the following indicators: c^2/gl = 1,38, RMR = 0,09, GFI = 0,92, AGFI = 0,90, CFI = 0,95, TLI = 0,93, RMSEA = 0,04, CAIC = 536,70 e ECVI = 2,63. All saturations (Lambdas, λ) were within the expected range | 0 - 1 |, condition that reveals no problems with the estimation that was intended, with all are statistically different from zero (t> 1.96, p < 0.05) guaranteeing the quality of the structural validity. It is noteworthy that, as an additional result, it was observed that the general Cronbach's alphas of 0.80, ranging from 0.78 to 0.79, when in item exclusion in the factors.

With the guarantee of the quality of the validity of the factorial structure of the Zarit scale, the calculation of composite reliability (CC) and mean extracted variance (VME) was performed; in the first evaluation a score level above 0.70 is required, while in the second, a level above

TABLE 1 – Item-factor distribution of the 5-dimensional version of the ZBI scale proposed by Ferreira et al., By Lu et al. and by Brazilian judges. João Pessoa, PB, Brazil, 2015.

Zarit Scale Items	Factor structure Ferreira et al. (2010)	Factor structure Lu et al. (2009)	Factor structure proposed by Brazilian judges
1. Do you feel as if more help is asked for by *s* than needed?	F3	F3	F3
2. Do you feel that because of the time you spend with *s* you	F3	F3	F3
3. Do you feel stressed between taking care of *s* your other responsibilities with family and work?	F3	F3	F3
4. Do you feel embarrassed about *s*'s behavior?	F4	F4	F4
5. Do you feel irritated when *s* is around?	F4	F4	F4
6. Do you feel that *s* negatively affects your relationships with other family members or friends?	F4	F4	F4
7. Do you feel afraid of *s*'s future?	**F1**	**F2**	**F1**
8. Do you feel that *s* depends on you?	**F3**	**F2**	**F3**
9. Do you feel tense when *s* is around?	**F2**	**F4**	**F4**
10. Do you feel that your health has been affected because of your involvement with *s*?	F2	F2	F2
11. Do you feel that you do not have as much privacy as you would like, because of s?	F2	F2	F2
12. Do you feel that your social life has been jeopardized because you are taking care of *s*?	F2	F2	F2
13. Do not you feel free to have visitors at home, because of *s*?	**F2**	**F2**	**F4**
14. Do you feel as if *s* expects you to take care of them, as if you are the only person he/she can depend on?	**F3**	**F2**	**F3**
15. Do you feel that you do not have enough money to take care of *s*, in addition to your other expenses?	F1	F1	F1
16. Do you feel that you will not be able to take care of *s* for much longer?	F1	F1	F1
17. Do you feel that you have lost control of your life since *s*'s disease?	F1	F1	F1
18. Would you simply like to let someone else take care of *s*?	**F2**	**F3**	**F3**
19. Do you feel uncertain about what to do for *s*?	F1	F1	F1
20. Do you feel that you should be doing more for *s*?	F5	F5	F5
21. Do you feel that you could take better care of *s*?	F5	F5	F5

Notes: F1 = Loss of control; F2 = Sacrifice; F3 = Dependency; F4 = Fear/Anguish; F5 = Self-criticism.

TABLE 2 – Discriminatory power of the items of the Zarit Burden Interview Scale. João Pessoa, P B, Brazil, 2015.

Zarit Items	T	p <
Item 01	-2,34	0,01
Item 02	-7,16	0,01
Item 03	-6,68	0,01
Item 04	-2,21	0,01
Item 05	-5,47	0,01
Item 06	-3,40	0,01
Item 07	-3,28	0,01
Item 08	-4,07	0,01
Item 09	-2,71	0,01
Item 10	-5,39	0,01
Item 11	-6,04	0,01
Item 12	-5,80	0,01
Item 13	-3,76	0,01
Item 14	-5,35	0,01
Item 15	-2,30	0,01
Item 16	-5,64	0,01
Item 17	-5,75	0,01
Item 18	-4,50	0,01
Item 19	-2,62	0,01
Item 20	-3,16	0,01
Item 21	-3,18	0,01

TABLE 3 – Comparison of the psychometric indicators of the factorial structure of the Zarit Burden Interview scale proposed by Ferreira et al., By Lu et al. and by Brazilian judges. João Pessoa, PB, Brazil, 2015.

Models	χ^2/gl	RMR	GI	AGFI	CFI	TLI	RMSEA (Interval)	CAIC	ECVI (Internval)
Model 1	1,64	0,14	0,83	0,79	0,84	0,81	0,07 (0,05-0,08)	617,72	2,95 (2,63-3,13)
Model 2	1,62	0,14	0,85	0,80	0,84	0,81	0,07 (0,05-0,08)	636,38	2,95 (2,63-3,13)
Model 3	1,69	0,14	0,84	0,78	0,84	0,79	0,07 (0,06-0,09)	665,45	3,05 (2,96-3,90)
Model 4	1,38	0,09	0,92	0,90	0,95	0,93	0,04 (0,03-0,07)	536,70	2,63 (2,54-2,89)

Note: Model 1 = One-factor structure; Model 2 = Factor structure (Ferreira et al., 2010), Model 3 = Structure Lu et al. (2009) Model 4 = Structure proposed by judges.

TABLE 4 – Indicators of the predictive estimates of the 5-dimensional version of the ZBI scale proposed by Brazilian judges. João Pessoa, PB, Brazil, 2015.

Zarit Factors			Estimate	D.P.	Criterion Ratio	p <
Sacrifice	<-->	Dependency	**0,53**	0,14	3,68	0,001
Dependency	<-->	Loss of Control	**0,10**	0,06	1,53	0,13
Loss of Control	<-->	Fear/Anguish	0,04	0,02	1,50	0,13
Fear/Anguish	<-->	Self-criticism	0,06	0,04	1,27	0,20
Sacrifice	<-->	Loss of Control	**0,12**	0,08	1,61	0,11
Sacrifice	<-->	Fear/Anguish	0,**14**	0,05	2,69	0,001
Sacrifice	<-->	Self-criticism	-0,09	0,11	-0,80	0,43
Dependency	<-->	Fear/Anguish	-0,01	0,03	-0,14	0,89
Dependency	<-->	Self-criticism	**0,13**	0,10	1,28	0,20
Loss of Control	<-->	Self-criticism	0,01	0,02	0,39	0,70

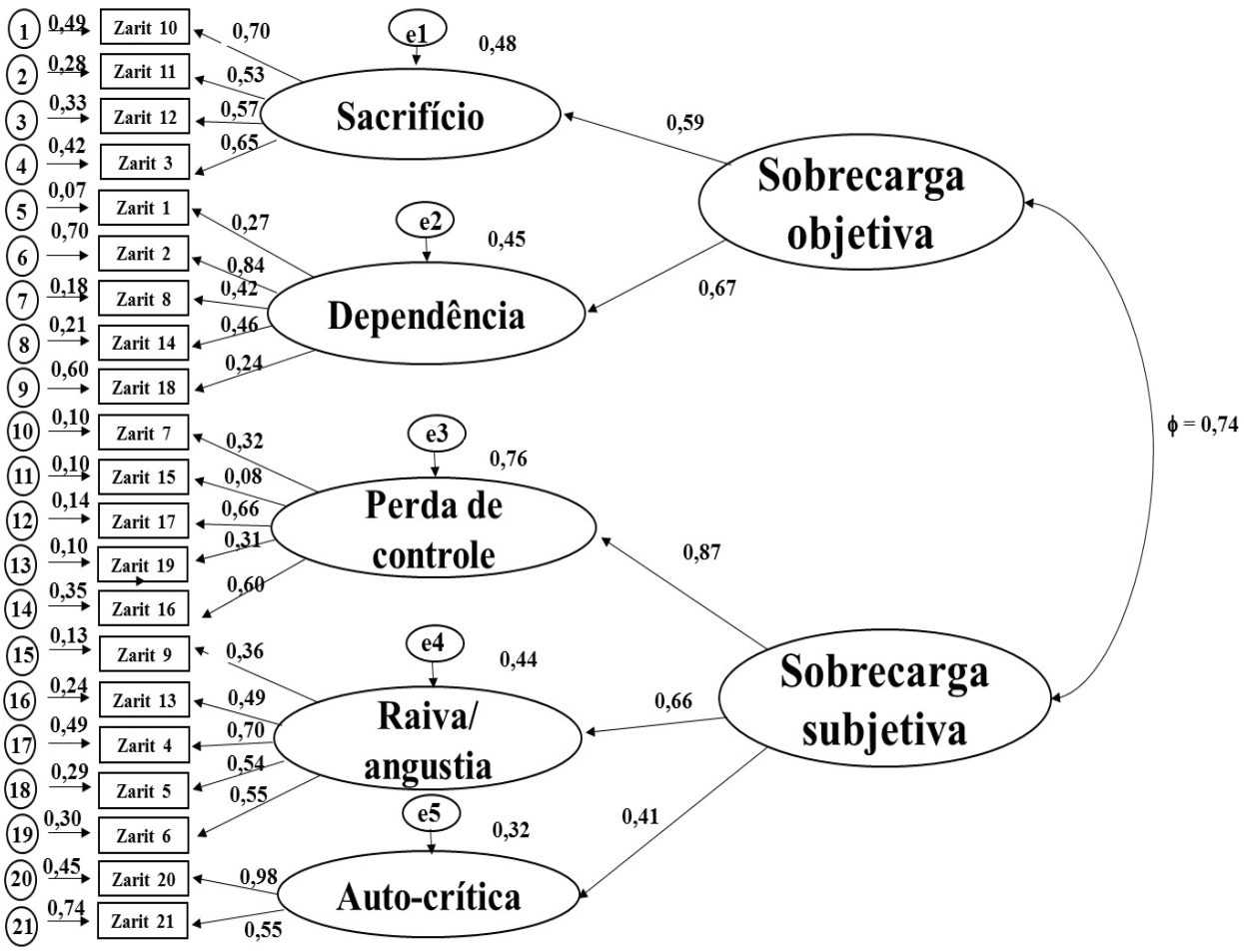

FIGURE 1 – Structural hierarchical factorial of the pentadimensional version of the ZBI scale proposed by Brazilian judges. João Pessoa, PB, Brazil, 2015.

0.50. In this way, the following results can be observed for WC and VME in relation to the following dimensions: sacrifice (respectively, 0.80 and 0.85), dependence (respectively, 0.81 and 0.83), loss of control (respectively, 0.88 and 0.89), rage-distress (respectively, 0.83 and 0.87) and self-criticism (0.86 and 0.96, respectively); these were above that required in the statistical literature[22-23], a condition that evidences, respectively, the reliability and convergent validity, contributed to the description of the latent construct.

DISCUSSION

The ZBI Scale comprises 22 items to measure the overload and assesses the physical, psychological, emotional, social and financial aspects. They have been widely used both in clinical practice and in the level of research in several countries, including the United States, where it was developed. Some studies only use the global score as a form of evaluation of the overload [25-26]. However, the overall score may not provide a complete and accurate assessment and caregivers with an identical score may be affected by different aspects of loading.

Some studies have demonstrated good psychometric results using a multidimensional structure of the ZBI Scale. When examining ZBI in a sample of caregivers of relatives with dementia, the authors Whitlatch et al.[27] proposed a two-factor structure (personal stress and stress due to paper) that contained 18 items. In the study by Knight et al.[28] a structure was proposed with 14 items distributed in three factors (Fear/Anguish, Patient Dependency and Self-Criticism).

It is worth mentioning that the evaluation of the impact on the role of caregiver in families of patients with stroke is essential for the provision of important information for the development of psychosocial and educational interventions capable of effectively helping these families and improving the quality of life of caregivers. It is known that the scale of ZBI have been the most used to assess the burden of caregivers in Brazil, however with the overall score of the overload of the validity version for the country, do not have an accurate assessment and it is difficult to plan interventions.

Regarding the discrimination of the items, presented in Table 2, the discriminative power of all of them is high-

lighted, allowing to affirm that people are able to indicate and discriminate their responses in relation to the construct, that is, caregivers understand when they respond in the instrument never (lower score) or always (higher score) has overload.

As for the relationship between factors, sacrifice, dependence; loss of control, fear/anguish, and self-criticism, a correlation was found to be insignificant when correlated with each other as shown in Table 4. Thus, a confirmatory factorial analysis was conducted in this study, whose purpose is to analyze the relationship between a set of items and factors of a scale, taking into account aspects that should be solidly based on the theory that specifies the hypothetical causal relationships between latent factors (variables not observed) and their (observable) variables, while providing a set of indices that allow determining the adjustment of the model to the empirical data[28].

Through the confirmatory factor analysis, in this study it was possible to identify a hierarchical structure as the best to represent and evaluate the overload in caregivers of patients with stroke in Brazil, with the following factorial distribution: objective evaluation of the overload - sacrifice factor and dependence and the evaluation subjective overload - Loss of Control, Fear / Anguish and Self-criticism. The hierarchical structure assumes the existence of second order factors, which is the general dimension, the overload, which functions as the organizing center of the specific dimensions, the objective overload and the subjective overload.

Objective overload, consisting of the dependency and sacrifice factors, is related to the activities performed in the provision and supervision of care, as well as to the disturbances and limitations imposed on the social and professional life of the family member, and financial shocks. Subjective overload, which involved the loss of Control, Fear / Anxiety, and Self-Criticism factors, refers to family members' understanding and affection, apprehensions about the patient, the feeling of being burdened and discomfort in the exercise take care[29].

In order to complement the evidence of construct validity, an attempt was made to focus on the measure itself, dealing with its set of items, evaluating how well they could adequately represent the respective factors (constructs), being calculated VME, which indicates how much construct explains the set of items, consistent with the expected results were above that required in the statistical literature[21]. Compound reliability was also calculated, which has the advantage of not being influenced by the number of measurement items. In this case, values above 0.70 were observed, according to literature recommendations[23], therefore, the adequacy of this scale in terms of precision seems clear.

Thus, based on the results of this study, it will be possible to evaluate the dimensions of the overload with more confidence and security, allowing a better understanding of the process experienced by caregivers of stroke patients, as well as the development of interventions in the specific factors of this overload.

CONCLUSION

The study revealed that the hierarchical ZBI hierarchical scale presents better psychometric results compared to the one-dimensional scale validated and used in Brazil. Taking into account the set of previously presented results, evidences are verified that give account of the construct validity (factorial validity) and precision (internal consistency and composite reliability).

In general, in spite of these results, this study has some limits, referring to the size of the sample, which could be larger and more diversified, because, through a design with respondents-caregivers in different diseases, one could evaluate the levels of overhead between them; another limit, refers to the need for sample replications and comparisons and between instruments that assess the overload in different sociodemographic, hospital and residential contexts, especially taking into account the more specific or universal aspects of each space and culture.

Therefore, it is suggested to carry out new psychometric studies using the pentadimensional scale that will add evidence of its validity and precision in order to make this version accessible in Brazil to evaluate the overload of caregivers in various care situations.

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