Research

VARIABLES THAT PREDICT INFORMAL CAREGIVER OVERLOAD

Azela Angélica de la Cruz Palomo
Doctora en Desarrollo Educativo
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México
azelacruz@docentes.uat.edu.mx
https://orcid.org/0000-0002-123-2087.

Rodrigo César León Hernández
Doctor en Psicología en Salud
Facultad de Enfermería Tampico, Universidad Autónoma de Tamaulipas. Consejo Nacional de Ciencia y Tecnología, México
rcleonhe@conacyt.mx
https://orcid.org/0000-0001-5780-4382.

Florabel Flores Barrios .
Maestría en Ciencias de Enfermería
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México
fflores@docentes.uat.edu.mx
https://orcid.org/0000-0003-0340-3203.

Tranquilina Gutiérrez Gómez
Doctora en Enfermería
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México
tgutierr@docentes.uat.edu.mx
https://orcid.org/0000-0001-5522-4237

Carina Flores Barrios
Doctora en Desarrollo Educativo
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México
cfloresb@docentes.uat.edu.mx
https://orcid.org/0000-0002-2491-2990

Luz María Quintero Valle
Maestría en Ciencias de Enfermería
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México
lquinter@docentes.uat.edu.mx
https://orcid.org/0000-0001-6312-7576

María Isabel Peñarrieta de Córdova
Doctora en Salud Pública
Facultad de Enfermería de Tampico, Universidad Autónoma de Tamaulipas, México

Corresponding autor: rcleonhe@conacyt.mx

pcordoba@docentes.uat.edu.mx
https://orcid.org/0000-0002-9293-4024

ABSTRACT

OBJECTIVE: to identify predictive variables of caregiver overload in the southern area of Tamaulipas. MATERIAL AND METHODS: the intentional sample was of 215 informal caregivers and/or relatives of people with chronic diseases, users of two General Hospitals of Tamaulipas, Mexico. The study design was transversal and explanatory**.** RESULTS: more than half of the sample presented problems of overload (53%) and family dysfunction (51.6%). Also, it was detected that just over half is perceived with medium and low level of caregiving competencies (45.6%) and in some category of depression (39.1%). In the regression model, four predictors of overload were identified: depression, caregiving competencies, dependence on the caregiver and time spent on caregiving. The adjusted R2 = .33, indicates that these 4 variables explain one third of the variance of overload. In addition, the family functionality and age variables were not significant for the model. CONCLUSIONS: the profile of informal caregivers in this study sample coincides with that reported in the international literature and that the model of predictors of caregiving overload allowed the identification of some variables that influence caregiver overload.

Keywords (DeCS): Caregivers, chronic disease, depression, family relations.

INTRODUCTION

The severity of chronic diseases such as diabetes, hypertension, and cancer, creates limitations for people who suffer from them, therefore, at some point in their lives, they will require help that is usually provided by the family. The member who becomes a family caregiver is the one in charge of satisfying the need for daily care, his role requires effort and reflection to solve daily situations or problems, otherwise, at some point the caregiver's overload is present.

Various studies agree that the role of caregiving generally falls to a female family member [1-15], usually a spouse [1,2,7,8,9,16,11,13], daughter/son [2,3,13,15], with an age range of 18-82 years [3,5], average between 40 and 70 years [1,2,4-17], most of them married [3,6,7,10,14], or with a partner [9,12] and some of them single [5,15]. Their schooling level is basic [8,9,16], middle education [10,12,15] or bachelor's degree [11]. They are inserted in the work environment as employees [7-9] or retirees [10] and with low income [5,14].

Playing such a role is not simple, it requires great responsibility, dedication

and commitment, to the care of people with chronic diseases [9-11,14]. The time dedicated to the care of the other is variable, it can be months [16] or years, average ranges have been detected between 1 and 5 years [2,4,11-15] or up to 6 and 10 years [15], dedicating to the role between 10 and 24 hours a day [4,5,7,13-15], depending on the need of the person being cared for [2], therefore, this role can be demanding and exhausting, generates fatigue or changes in daily life with negative consequences such as physical and emotional burden [10], which is known today as caregiver overload.

Caregiver's burden or overload refers to the perception that caregivers have when performing activities focused on the care of others, it can arise when this activity is too demanding both physically and emotionally, and it increases even more when caregivers are older than 60 years, it causes physical decrease and cognitive impairment [1], and it is also related to the caregiver's disability [3], especially in those people with chronic diseases, who require palliative care [4,10,11]. The caregiver's perception also generates fear, anxiety, and depression [11,13], and in many cases manifests itself as exhaustion, fatigue [5], stress and impaired cognitive functions [9].

Associated with the above, it has been shown that caring for a person for more than 5 years [2,5] to 7 days a week [3] and dedicating more than 17 hours a day [5,14], generates an overload on the caregiver and in turn affects his/her physical and mental state. Such affectations are manifested as fatigue [10], body pain, vascular disease [5], worry [13], anxiety, depression [8,10], perceived stress [9] and low life satisfaction [2]. In older caregivers it also affects their physical fragility and cognitive performance [1].

In addition, it has been documented in previous studies of Latin American countries and Spain, overload percentages ranging from 40% to 69.7% [3,4,10,14,15], It has also been shown that 8 out of 10 caregivers refer to moderate to severe load [7].

In contrast, it is known that caregivers are not perceived as such, because of a strong sense of duty to their family member [13]. This condition may explain the high percentages of absence of overload (44.6% to 64.7%) [9,10,12,14], or in the category of slight overload (34% to 67.1%) [1,4,5]. The inconsistent results of the above-mentioned research show that playing the role of caregiver generates a different perception in each individual.

Likewise, it has been documented that overloading also produces limitations in the personal and work environments [13]; it generates changes in the daily routine, leisure activities and alteration in socialization, alterations, or abandonment in activities outside the home, including labor desertions that affect the economy of the families [5,13,15], since an association between overloading and economic income has been detected [5,14,16].

Another aspect associated with overload is the caregivers' place of residence, especially when they live with the caregiver, since the time spent and the burden of care is more demanding [7,16], which has repercussions on the environment and family functionality [3]. Some studies have identified that moderate and/or severe disability, suffering from medical co-morbidities,

de la Cruz Palomo AA, León Hernández RC, Flores Barrios.F, Gutiérrez Gómez T, Flores Barrios C, Quintero Valle LM, Peñarrieta de Córdova MI

dysarthria/aphasia, and disability, together with incontinence and symptoms of psychological distress, are all related to overloading [3,7].

The progress in the study of caregiver overload has also provided data on the variables that contribute to predicting this variable, among them age [11], anxiety and depressive symptoms [8,10,11], caregiving time [11], symptoms of psychological distress, moderate-severe disability of the caregiver, and incontinence [3,7]. In caregivers of people with cancer, congruence with disease prognosis [9], insomnia, and physical and mental functioning of the caregiver with chronic pain have been documented as predictors of overload [17].

Based on the specialized literature, it has been found that caregiver overload is a problem that affects the caregiver-sick relationship, harming the health of both individuals. It was also documented that there are several variables that influence this problem and that it increases with time. Therefore, the objective of the present study was to identify predictive variables of caregiver overload in the southern area of Tamaulipas.

METHODS

Participants

The intentional non-probabilistic sample was formed by 215 informal caregivers and/or family members of people with chronic diseases, users of hemodialysis units, chemotherapy, hospice, specialty outpatient, internal medicine, and surgery, from two General Hospitals in the southern area of Tamaulipas, Mexico. The inclusion criteria were over 18 years old with a minimum of 3 months in the role of primary caregiver. Participants who received any monetary payment for care were excluded.

The study design was cross-sectional and explanatory. It should be noted that this work derives from a larger project entitled Thematic Network of Self-Management in Chronic Diseases.

Measuring instruments

To assess the sociodemographic characteristics of the participants, a data card was applied with information on age, sex, years of study, marital status, relationship with the person in charge, the months spent in this role, occupation, and current job.

1. To evaluate the dependent variable "Overload", the Zarit instrument was used, which measures the load of the functions performed by informal caregivers from the perception of the caregiving process. The questionnaire consists of 22 Likert-type items, with response options: never, rarely, sometimes, quite often, and always. It is evaluated through the summation of the items with a range between 22 and 110 and can be interpreted as "the higher the score, the greater the level of burden on the caregiver". The cut-off points are: 22-46 (no overload), 47-55 (slight overload), and 56-11 (intense overload).[18] Reliability in Mexico was reported with Cronbach's alpha of 0.84, its construct validity was obtained through exploratory and confirmatory factor analysis that integrated three dimensions (impact of care, interpersonal relationship, and self-

efficacy expectations) and explained 50% of the variance [19].

2. The "CARE" instrument, developed by Carrillo, et al.[20], was used to assess caregiver competencies. It consists of 20 items, each item has four Likert-type response options: 0 (Almost never or never), 1 (Rarely), 2 (Many times) and 3 (Almost always or always. In the confirmatory factor analysis, 5 dimensions were obtained (learn, anticipate, self-regulate, harmonize and support) that explain 61.4% of the variance. Cronbach's alpha reliability of 0.76 has been reported [21].

3. The familiar functionality will be measured with the familiar APGAR. The instrument consists of 5 questions on a Likert scale from 0 to 4. Its Cronbach's alpha was 0.80. The interpretation of the instrument is "the higher the score, the better the perception of familiar functionality" in 4 different categories of 17 to 20 points is a functioning[22]. The confirmatory factor analysis showed a unidimensional structure of 5 items that explained 64.1% of the variance and a Chronbach's Alpha of 0.90(23) was obtained [23].

4. To measure depressive disorder, the Personal Health Questionnaire Depression Scale (PHQ-8) was used, which contains question-shaped items, each of which has four response alternatives ordered from least to most severe; each item has a value ranging from 0 to 3 points depending on the alternative chosen, and after directly adding up the score of each one, an overall score ranging from 0 to 24 points is obtained. Its construct validity

was obtained through confirmatory factor analysis, which showed a one-dimensional structure that explains 48% of the variance [24]. The reliability in Mexico was obtained with Cronbach's alpha of 0.79 and the interclass correlation coefficient of 0.85 [25].

5. Dependency was measured by applying the Barthel Scale to caregivers, who assessed the ability of the ill person to perform basic activities of daily living. The reagents evaluated 10 functional capacities whose values were between 0 and 100, with intervals of 5 points. The closer the score is to 0, the more dependence; closer to 100 the more independence. The interpretation categories are: 0 to 20 total dependence, 21 to 60 severe dependence, 61 to 90 moderate dependence, 91 to 99: low dependence and 100 independence. A confirmatory factor analysis obtained a one-dimensional structure that reports a Cronbach's Alpha of 0.98 and a McDonald's Omega of 0.99 [26].

Procedure

Once permissions were obtained from the corresponding institutions, a team of students was trained to standardize the application of the instruments and reduce the margin of error. Subsequently, the team went to the hospitals where the team members invited the family caregivers to participate on a voluntary basis. The procedure to be carried out was explained and the informed consent was read. Once the participant accepted to participate in the research, the consent was signed, and the instruments were applied. The study follows the provisions of the Regulations

de la Cruz Palomo AA, León Hernández RC, Flores Barrios F, Gutiérrez Gómez T, Flores Barrios C, Quintero Valle LM, Peñarrieta de Córdova MI

of the General Health Law regarding research for health in Mexico and was approved by the Ethics and Research Committee of the Nursing School Tampico of the Autonomous University of Tamaulipas.

Data processing and analysis were performed using SPSS version 25.

Descriptive statistics were applied using frequencies, percentages, central tendency, and dispersion measures. Inferential statistics were also applied by means of a multiple linear regression analysis with the Enter method.

RESULTS

The average age of the study sample was 49.9 years old, most of them were women (82.2%), married or in union (68.8%), the most frequent relationship with the person being cared for was daughter (37.4%), followed by wife (22%). The occupation with the highest percentage is the home (44.9%) and just over half of the caregivers do not work (51.4%). An average of 11.25 years of study (equivalent to the upper middle level) and 6.6 years, on average, dedicated to caregiving were also reported (Table 1).

Table 1. *Characteristics of the study sample.*

Gender (*n* = 215)	*f*	*%*	Caregiver's occupation (*n* = 215)	*F*	*%*
Woman	178	82.2	Employee	45	21.7
Man	37	17.2	Home	93	44.9
Marital Status (*n* = 215)			Unemployed	1	.5
Married/cohabitation	148	68.8	Retired/Pensioner	21	10.1
Widower	9	4.2	Merchant	13	6.3
Divorced	16	7.4	Professional	25	12.1
Single	42	19.5	Student	3	1.4
Relationship (*n* = 214)			Worker	6	2.9
Wife/partner	47	22			
Husband/partner	12	5.6			
Mother	15	7			
Daughter	80	37.4			
Son	17	7.9			
Sister	11	5.1			
Brother	3	1.4			
Daughter-in-law	11	5.1			
Son-in-law	4	1.9			
Other	14	6.5			
Currently working (*n* = 212)					

Yes	103	48.6
No	109	51.4

Source: Own elaboration.

With respect to the research variables, it is observed that almost half of the sample did not report overload (47%), nor family dysfunction (48.4%). Also, it was reported that more than half of the caregivers are perceived to have a high level of caregiving competencies (54.4) and no depression (60.9), although the highest percentage perceives moderate dependence in the people under their care (Table 2).

Table 2. *Percentage distribution of research variables.*

Caregiver overload levels	f	%	Caregiver competencies	F	%
No overload	101	47.0	Low level	131	11.2
Slight overload	48	22.3	Medium level	44	34.4
Severe overload	66	30.7	High level	26	54.4
Family Functionality Questionnaire			**Depression levels**		
Severe Dysfunction	29	13.5	Absent	131	60.9
Moderate Dysfunction	20	9.3	Slight	44	20.5
Slight dysfunction	61	28.4	Moderated	26	12.1
Functionality	105	48.8	Severe	8	3.7
Levels of dependence			Grave	6	2.8
Total dependence	22	10.2			
Severe dependence	45	20.9			
Moderate dependence	70	32.6			
Low Dependence	10	4.7			
Independence	68	31.6			

Source: Own elaboration.

To accomplish the objective of identifying predictive variables of caregiver overload in the southern zone of Tamaulipas, a Multiple Linear Regression analysis was applied. The dependent variable was caregiver overload and the independent ones: age, caregiving time, depression, family functionality, caregiving competencies and perceived dependence in the caregiver. The results of the ANOVA (F=18.83, p<.001) indicate that there is a significant linear relation between 4 independent variables and the dependent one. Thus, the independence between the residues was also confirmed by the Durbin-Watson statistic (2.134).

de la Cruz Palomo AA, León Hernández RC, Flores Barrios.F, Gutiérrez Gómez T, Flores Barrios C, Quintero Valle LM, Peñarrieta de Córdova MI

As can be seen in Table 3, the depression variable turned out to be the best predictor of overload (β=0.404). It should be noted that a marginal significance (p=0.051) was observed in the time of care variable, which was considered the least important predictor (β=-0.113). The results in the adjusted R2 = 0.33. They indicate that the model explains one third of the overload variance, with an estimated error of 12.7. It is important to note that the family functionality and age variables were not significant for the model.

Table 3. *Variables predicting caregiver overload (Multiple Linear Regression analysis).*

Variable	Non-standardized coefficients		Standardized Coefficients		
	β	EE	β	t	p
(Constant)	66.596	6,233		10.684	.000
Total Depression	1.174	.177	.404	6.648	.000
Caregiver's competencies Total	-.341	.094	-.221	-3.621	.000
Total dependence	-.079	.029	-.156	-2.750	.006
Caregiving time	-.018	.009	-.113	-1.961	.051
Family Functionality	-.207	.204	-.065	-1.014	.312
Age of caregiver	.072	.071	.058	1.019	.309

Source: Own elaboration.

DISCUSSION

The objective of the present study was to identify predictive variables of caregiver overload in the southern area of Tamaulipas. In relation to the variables predicting overload, the results of the regression model show that the predictors of overload were depression, caregiver competence and dependency. Also, a marginal significance was detected in the time of care variable (p=0.051), with the overload dependent variable.

The most relevant result of this study was that the variable depression was identified as the best predictor of caregiver overload (β=0.404), this causal relation between both variables was detected in the study of Perpignan-Galvañ et al.[10] who agree that depression is the variable with the greatest influence on overload (β=0.459), in a sample of caregivers of people who require palliative care at home. Also, in the study by Macchi et al.[11], it was detected that depression predicts overload, however it is not the most influential variable. This confirms that depression is a factor that directly influences the exercise of the caregiver's role, in such a way that it directly contributes to the experience of overload.

In addition, it is important to note that the model integrated the variables: depression, caregiver competence, dependency, and caregiving time, which

together explain one third of the caregiver overload variance. This result is like the study of Perpignan-Galvañ et al.[10], who managed to explain a higher percentage of overload (52%), through the predictors: depression, anxiety, and post-traumatic stress. It is important to note that the percentage of overload explained indicates that there may be other variables that contribute to overload. These other variables can be of a sociodemographic, psychological, and clinical nature, as shown by different studies[7,10,11,16,17].

The importance of identifying the predictors of overload lies in the fact that it contributes to the detection of causal variables, in this way the relation between them is clarified and it brings knowledge to design strategies to help reduce the problem of overloading, which affects negatively in both elements of the care-disease binomial in different ways, as it is shown in previous studies[1-5,7-10,15].

Among others results of the study, it was found that the profile of family caregivers of people with chronic disease has the following characteristics: average age 50 years, mostly married women, the relationship with the caregiver was daughters and wives, this evidence coincides with previous studies conducted in Ecuador [3], Brazil [4,5], Nigeria [7], Spain [8,9], and Cuba [13]. The coincidences in the profile of the caregiver reported in different countries can be argued with what Kowalska et al. [2] point out about the caregiving role, which often falls to the family, primarily the daughters or spouse, who culturally have a great sense of duty and responsibility to provide care.

In relation to their daily activity, half of the caregivers referred to being dedicated to the home and a just over half did not work, these results have a similar pattern with other studies [10,14], suggesting that they are fully dedicated to the caregiving role and to meeting the needs of the person in their care. In addition, it was documented that the caregivers in this study have spent an average of 6.6 years in this role. This confirm that caregivers are exposed to high workloads that, in some cases, have negative repercussions [10,14] such as changes in daily routine, exhaustion, fatigue and a decrease in social activities [5].

With reference to the average years of study of the caregivers, it was detected that they are equivalent to the upper middle level education. This result differs from other research that reports an elementary school level or lower [1,3,8], however, it is consistent with some other studies that detected medium and higher education level [11,10,15]. It should be noted that the schooling level could be a determinant for a greater understanding and improvement of the competencies of the caregiving role.

Considering that a chronic condition generates many physical changes and dependence on the family caregiver, moderate and severe dependence was identified in half of the caregivers in this study. These results are consistent with some studies reporting more than 5 years of care for older adults with moderate to severe dependence [2,3,11,15]. Under these circumstances, the negative effects that the caregiving role can generate are understandable, as well as the need to acquire caregiving skills or competencies to improve performance.

de la Cruz Palomo AA, León Hernández RC, Flores Barrios.F, Gutiérrez Gómez T, Flores Barrios C, Quintero Valle LM, Peñarrieta de Córdova MI

Associated with this, a high level of competence was reported in half of the caregivers in this study. This result differs from a study carried out in Brazil, in which it was reported that the caregivers were at a medium level of competence, furthermore, it refers to the fact that the competencies are related to the ability to care and allow for an improved interpersonal relationship between the caregiver and the person receiving care, hence the importance of its evaluation [12].

In relation to the analysis of the overload variable, the absence of overload was observed in almost half of the participants (47%). These results are consistent with several studies in which percentages of absence of overload were reported between 44.6 and 64.7% of the samples [9,12,14]. However, a troubling fact is that nearly one-third of the caregivers in this study (30.7%), were at the level of severe overload, which as previously documented, has negative implications for caregivers. It is also important to note that the percentages of severe overload reported at international level are not constant: in samples of family caregivers of older adults in Ecuador 58.5% [3], of people requiring palliative care in Spain 41.6% [10], of older adults with diabetes in Mexico 48.3% [14], of older adults with severe dependency in Chile (69.7%) [15], of people with palliative care in Brazil (40%) [4] and of older adults with spinal tumor in northern China 24% [16].

On the other hand, the family functionality in almost half of the caregivers in this study was adequate (48.8%) and most caregivers perceived independence (31.6%) or moderate dependence (32.6%) on the family member under their care. This result differs from the study by Chamba et al. [3] who reported family dysfunction in most caregivers. In this regard, another study found that the family provides emotional and spiritual support by lightening the burden of responsibility [13].

CONCLUSIONS

Based on the results, it is concluded that that the model of overload predictors was significant, and it was possible to identify some predictive variables of the caregiver's overload in the southern area of Tamaulipas (depression, caregiver's competence, dependency, and caregiving time). This model represents an advance in the knowledge and understanding of caregiver overload.

The profile of informal caregivers in the Mexican sample coincides with that reported in the international literature. Also, it is concluded that although the risk in the variables overload, dependence and depression was low, and the indicators of competences and familiar functionality were in high percentages, there is a percentage of the sample that presents problems in the negative end and that can affect the caregivers' health.

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de la Cruz Palomo AA, León Hernández RC, Flores Barrios.F, Gutiérrez Gómez T, Flores Barrios C, Quintero Valle LM, Peñarrieta de Córdova MI

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