

The Association between Caregiver Burden and Resilience in Family Caregivers of Older Adults with Chronic Obstructive Pulmonary Diseases

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ABSTRACT

Background: The close engagement of family caregivers in the care of older adults with chronic obstructive pulmonary disease (COPD) may predispose them to anxiety, frustration, and social isolation, which may consequently affect their resilience and care burden. **Objectives:** The purpose of this study was to examine the relationship between caregiver burden and resilience in family caregivers of older adults with COPD. **Methods:** This cross-sectional, descriptive study was conducted on 240 family caregivers of older adults with COPD who were referred to a specialty pulmonology clinic in Iran. The participants were recruited by convenience sampling. Data were collected using the Zarit Burden Inventory and the 25-item Connor Davidson Resilience Scale. Statistical analyses included *t*-test, analysis of variance, Pearson's correlation coefficient, and stepwise multiple regression. **Results:** The mean age of the caregivers was 51.20 ± 11.84 years. The majority of participants experienced low (55.7%) or moderate (43.8%) caregiver burden. The overall mean caregiver burden score was also moderate (20.01 ± 6.46). The overall mean resilience score was high (77.85 ± 10.17). An inverse relationship was found between resilience and caregiver burden ($r = -0.38$; $P < 0.001$). **Conclusion:** As resilience increases, caregiver burden decreases. Implementing early counseling intervention for promoting resilience, increase tolerance to problems, and reduce caring burden among family caregivers of older adults with COPD.

KEYWORDS: Care burden, Caregiver, Chronic obstructive pulmonary disease, Older adults, Resilience

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is an important cause of morbidity and disability among older adults.^[1] More than 65% of people with COPD are over the age of 80 years. The overall prevalence of COPD in Iran is 5% and it mainly affects people over 55 years old.^[1,2] Predominant symptoms include fatigue-induced hypoxia and restrictions in daily living activities.^[3,4] These limitations increase physical disability and older adults' dependence on family caregivers.^[5] Family caregivers play a crucial role in caring for persons with COPD. Caregivers provide home care to older people and contribute significantly to their treatment adherence and help reduce the need for emergency medical visits.^[6]

The close engagement of family caregivers in the care of older people may predispose them to anxiety, frustration, and depression,^[7,8] which may consequently affect their resilience and perceived stress.^[7] Caregiver burden is the physical, psychological, and social reaction of caregivers to the act of care.^[8] Most family caregivers of older

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Submitted: 27-Mar-2022 **Revised:** 06-Nov-2022 **Accepted:** 19-Dec-2022
Published: 29-Mar-2023

How to cite this article: Sabzalipoor F, Fotokian Z, Alipoor ZJ, Monadi M. The association between caregiver burden and resilience in family caregivers of older adults with chronic obstructive pulmonary diseases. *Nurs Midwifery Stud* 2023;12:35-41.

Access this article online

Quick Response Code:



Website:
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DOI:
10.4103/nms.nms_23_22

adults with disabilities and chronic disorders experience social (82.9%), physical (35.4%), and occupational problems (38%) as a result of the large amount of time committed to caring for people with COPD.^[9,10] A study showed that 65.1% of family caregivers of persons with COPD suffer from health-related problems (e.g., feeling tired and depressed). Furthermore, a majority of them experience social pressures related to a lack of leisure activities, suffer from financial problems due to job loss, and experience emotional problems.^[2]

Several individual and environmental factors may affect the caregiver burden. Psychological characteristics of caregivers, including their resilience, are among these factors.^[10-13] Some studies have reported that resilience can significantly reduce the caregiver burden.^[14,15] A study also shows that people with low resilience are more vulnerable, lack the courage, motivation, and strategies for changing stressful situations, exaggerate their problems.^[13] In Iran, some studies have examined the relationship between resilience and caregiver burden in the parents of students with mental disabilities^[14] and thalassemia major.^[15] The extent of our knowledge about caregiver burden and resilience in COPD is limited to the results of a Spanish study that examined caregiver burden in persons with COPD.^[2] However, the factors affecting the family caregivers of persons with COPD may vary according to their sociocultural context.^[4,6]

Objectives

The purpose of the study was to examine the relationship between resilience and caregiver burden in the family caregivers of Iranian older adults with COPD.

METHODS

Design, setting, and participants

This cross-sectional study was conducted with caregivers of older adults with COPD. Participants were recruited by convenience sampling from the family caregivers of older adults with COPD who had health records at the specialty pulmonary clinic of Babol. Data were obtained from April to December 2020.

The sample size was calculated using the formula for estimating the population mean ($n = \frac{Z^2 \delta^2}{d^2}$) and the results of a pilot study on 10 persons who had primary roles as caregivers of older adults with COPD. Considering an alpha of 0.05, $S^2 = 58$,^[2] and Effect size $d = 1$ ($n = [2^2 \times 58] / 1$), an estimated 240 subjects were needed for this study. Included participants were those who had primary roles as caregivers of older adults (aged over 65 years) with COPD who had cores of 4 or less on the Katz Activities of Daily Living (ADL)

scale by self-report,^[16] but without other debilitating physical and mental illnesses such as rheumatoid arthritis, schizophrenia, and Alzheimer's disease (based on the medical record). The ADL score was given based on the family caregiver's perceptions about the person with COPD ADLs.

The caregivers with a debilitating illness who were unable to complete the questionnaire even with the help of the researcher were excluded from the study, and this was the only exclusion criterion.

Procedures

A list was prepared from older persons with COPD who met the eligibility criteria. The persons were contacted and invited to participate in the study, and if they agreed to take part, a copy of the study instruments was given to them to be completed manually when they visited; then, based on their preferences, some questionnaires were completed by face-to-face interviews at the caregivers' home and others were arranged to be filled out in the waiting room of the clinic during the periodic visit of the older adult with COPD in accordance with the health protocols.

Data collection instruments

A demographic characteristics questionnaire, the Zarit Burden Inventory (ZBI), the Katz ADL Scale, and the 25-item Connor Davidson Resilience Scale (CD-RISC-25) were used for data collection. The demographic characteristics questionnaire included questions about the caregiver's age, gender, education, marital status, occupation, income, comorbidities, kinship, cohabitation with the older adult, the duration of caring for the older adult, and medical records were used to assess the severity of the older adult's COPD. Caregiver burden was measured using the ZBI. ZBI is a 22-item instrument developed by Bachner (2013). It assesses the stressors experienced by the caregiver in personal, social, financial, and relational areas. The inventory items are scored on a five-point Likert scale from "0 = never" to "4 = always" and produce a total score ranging from 0 to 88. Scores of 0–20 indicate low or no burden, scores of 21–40 moderate, and 41–88 severe burden.^[17] Talebi *et al.* confirmed the validity and reliability of the Persian translation of ZBI in the caregivers of hemodialysis patients with a total Cronbach's alpha of 0.86.^[18]

ADL was measured by the Katz ADL Scale, which includes six items about ADL and ranks the subject's performance in the six functions of bathing, dressing, toileting, transferring, urinary and defecation continence, and feeding. All six functions have yes/no items that are scored as "1: Independent" or "0: Dependent." A score of 6 indicates complete functioning, 4 indicates

moderate functional impairment, and 2 or less indicates severe functional impairment. The validity and reliability of the Persian translation of this index were confirmed by Mohammadinezhad *et al.*, in stroke patients with Cronbach's alpha of 0.84.^[16]

Resilience was measured by the 25-item CD-RISC-25. CD-RISC-25 was designed by Connor and Davidson (2003) with 25 items that are scored on a 5-point Likert scale, from "Not true at all = 0" to "Completely true = 4." The overall score of the scale ranges from 0 to 100. Higher scores indicate greater resilience. The cut-off score on the scale is 50. The validity and reliability of this scale were assessed and confirmed by Karimirad *et al.* among the caregivers of children with intellectual disability with Cronbach's alpha of 0.89^[19] Ghaffari *et al.* (2019) also used the scale on the family caregivers of older adults with Alzheimer's disease and reported Cronbach's alpha of 0.85.^[20] In the present study, the face and content validity of ZBI, ADL, and CD-RISC-25 were evaluated qualitatively. The qualitative content validity was checked by ten specialists (faculty members specialized in geriatric nursing as well as infectious and internal medicine physicians) and their comments were used for revision purposes. The questionnaires were reviewed before entering the content validity assessment stage and the simplicity, clarification, and comprehensiveness of the items were checked. The reliability of ZBI, ADL, and CD-RISC-25 was confirmed with Cronbach's alpha of 0.84, 0.91, and 0.8, respectively, in this sample.

Ethical considerations

The study was approved by the Ethics Committee of Babol University of Medical Sciences, Babol, Iran (Ethic code: IR.MUBabol.HRI.REC.1398.326). Written informed consent was obtained from all the participants before beginning the study. The participants were also briefed on the research objectives and ensured about the confidentiality of their data, the voluntary nature of participation in the study, and their right to withdraw from it at any time.

Data analysis

The data were analyzed in SPSS software v. 16 (IBM SPSS., Armonk, NY, USA). The normality of the data was examined using the Kolmogorov–Smirnov test and all the quantitative variables showed a normal distribution. Therefore, the independent-sample *t*-test, the analysis of variance, and Pearson's correlation coefficient were used to compare the mean scores in different subgroups of caregivers. A stepwise multiple regression analysis was used to examine the relationship between caregiver burden and their personal characteristics as well as the resilience score.

RESULTS

A total of 240 family caregivers of older adults with COPD entered this study and there were no withdrawals; therefore, data from all 240 subjects were analyzed. The mean age of the caregivers was 51.20 ± 11.84 years. The majority of the caregivers (70.4%) were female, 87.1% were married, and 59.6% had less than high school diploma. Most of the caregivers (62.5%) were homemaker, lived with their spouses (46.2%), and the majority of them had cared for over 2 years (72.1%) [Table 1]. The majority of the participants experienced low (55.7%) or moderate (43.8%) burden. Furthermore, most of the family caregivers (99.2%) presented a high level of resilience and the overall mean resilience score was 77.85 ± 10.17 [Table 2]. There were statistically significant relationships between caregiver burden and variables such as caregivers' age, gender, education, occupation, income, duration of caring for the older adult, and living arrangements ($P < 0.05$). The mean perceived burden was significantly higher in the female caregivers ($P < 0.001$), in those with primary school education ($P = 0.022$), in the homemaker ($P = 0.003$), in those with a low income ($P < 0.001$), in those who had been caring for the older adult for over 2 years ($P = 0.004$), and in those who were caring for their spouse ($P < 0.001$). Nevertheless, no significant relationship was found between caregiver burden and the caregivers' marital status ($P = 0.72$), the caregivers' comorbidities ($P = 0.11$), and the severity of COPD in the older adult ($P = 0.58$). An inverse relationship was found between resilience and caregiver burden ($r = -0.38$; $P < 0.001$), as the caregivers with a higher resistance experienced less burden [Table 2].

A stepwise multiple regression analysis was used to examine the relationship between caregiver burden and their personal characteristics as well as the resilience score. Independent variables (i.e., personal characteristics and resilience scores) were entered into three models. In the first model, resilience explained 13% of the variance in caregiver burden. In the second model, the variable of income, and in the third model, the variable of the caregiver's kinship with the older adult were entered into the model and explained 24% of the variance in caregiver burden. The regression model also demonstrated that resilience had the greatest effect on caregiver burden ($\beta = -0.329$), such that for every 1-unit increase in caregiver's resilience, the perceived burden decreased by 0.33 units. The beta coefficient values were also -0.25 and 0.19 for income and caregiver's kinship with the older adult, respectively. In other words, the amount of caregiver burden in people with moderate and sufficient income was 0.25 units lower

Table 1: The demographic and clinical characteristics of the caregivers of older adults with chronic obstructive pulmonary diseases

Variable	n (%)	Minimum-maximum	Mean \pm SD
Age (years)			
Caregivers	240 (100)	42–6	51.20 \pm 11.84
Older adults with COPD	240 (100)	65–86	71.78 \pm 9.65
Gender			
Male	71 (29.6)		
Female	169 (70.4)		
Marital status			
Married	209 (87.1)		
Divorced	19 (7.9)		
Widowed	12 (5.0)		
Education			
Primary school	67 (27.9)		
Junior high school	76 (31.7)		
High school diploma	63 (26.2)		
University education	34 (14.2)		
Occupation			
Retired	29 (12.1)		
Laborer	37 (15.4)		
Corporate worker	24 (10.0)		
Homemaker	150 (62.5)		
Income			
Insufficient	90 (37.5)		
Sufficient	122 (50.8)		
More than sufficient	28 (11.7)		
Caregiver's comorbidities			
Hypertension	38 (15.8)		
Diabetes mellitus	31 (12.9)		
Cardiac disorder	7 (2.9)		
No other comorbidities	164 (68.3)		
Patient's disease stage			
I	2 (0.8)		
II	130 (54.2)		
III	104 (43.3)		
IV	4 (1.7)		
Duration of caring for the patient (months)			
6	15 (6.2)	6–42	23 \pm 9
6–24	52 (21.7)		
24<...>36	76 (31.65)		
>3 years	97 (40.45)		
Living arrangements			
With the spouse	111 (46.2)		
With the children	64 (26.7)		
With the spouse and children	65 (27.1)		
Kinship with the older adult			
Patient's husband	12 (5)		
Patient's wife	98 (40.8)		
Patient's daughter	54 (22.5)		
Patient's son	45 (18.8)		
Patient's daughter- in-law	31 (12.9)		

COPD: Chronic obstructive pulmonary disease, SD: Standard deviation

than in those with insufficient income. Furthermore, the score of caregiver burden was 0.19 units higher

in the spouses than in those who had other kinships with the patient [Table 3].

Table 2: The descriptive statistics and the relationship between caregiver burden and resilience

Variable	Scoring	Mean \pm SD	Minimum-maximum	n (%)	Correlation
Caregiver burden	Low (0-20)	15.57 \pm 3.99	2-20	134 (55.7)	$r = -0.38$
	Moderate (21-40)	25.41 \pm 3.72	21-35	105 (43.8)	$P < 0.001^a$
	Severe (41-88)	47.01	47	1 (0.4)	
	Total	20.01 \pm 6.46	2-47	240 (100)	
Resilience	Low (<50)	45.50 \pm 0.70	45-46	2 (0.8)	
	High (>50)	78.13 \pm 9.77	52-100	238 (99.2)	
	Total	77.85 \pm 10.17	45-100	240 (100)	

^aThe results of Pearson's correlation coefficient. SD: Standard deviation

Table 3: The stepwise regression model for the relationship between the independent variables and caregiver burden

Independent variable	Standardized beta	Nonstandardized coefficients	t	SE	Significance level ^b	CI ^c (minimum-maximum)
Constant coefficient	-	21.32	25.42	0.83	0.00	19.66-22.97
Caregivers' resilience	-0.32	-3.89	-5.61	0.84	0.00	-5.56-2.23
Income	-0.25	-2.62	-4.51	0.69	0.00	-4.32-1.52
Kinship with the older adult	0.19	2.46	2.99	0.82	0.003	0.84-4.077
Summary of the final model	$F = 22.49, P < 0.001$		$R^2 = 0.239^a (=0.24)$		Adjusted $R^2 = 0.205$	

^aBivariate correlations squared, ^bSignificant at the <0.05 level, ^cConfidence interval. SE: Standard error, CI: Confidence interval

DISCUSSION

The results showed a significant inverse relationship between resilience and caregiver burden. In other words, as resilience increases, caregiver burden decreases. This finding is consistent with the results reported by Scott,^[21] Li,^[22] Mahmoud,^[23] Hassanzadeh and Hojjati,^[14] Soto-Rubio (2020).^[24] The results of the above studies showed a significant inverse relationship between the emotional, social, physical, and economic burden induced caring with caregivers' mental health of the patients with schizophrenia, Alzheimer's, and the parents of students with intellectual disabilities. In another study, Fernandez-Calvo *et al.* found that interventions for encouraging active coping techniques (i.e., resilience training) had the greatest effect on caregivers in terms of reducing the impact of adversities generated during care, creating self-confidence to move forward, and promoting competence in providing care.^[25]

Most of the family caregivers in this study showed a high degree of resilience. This finding contradicts the results of some former studies.^[26-28] Other studies have also shown that as the older adult's dependence on the caregiver and the resultant caregiver burden increase, the resilience of the caregiver diminishes.^[2,29] This discrepancy in findings might be attributable to participants' demographic characteristics, as the participants in this study were caring for older adults with COPD who were mostly in Stages II and III of the disease. Stage-II COPD is considered moderate and the patient is still in a relatively stable condition and does not impose great pressure on his family caregivers. In older adults with stage-II of the disease, the patient's

self-care needs are still met by themselves and they do not become severely dependent on the family to meet their needs. In these instances, the caregivers experience less caregiving burden. Nonetheless, in most of the cited studies, the caregivers had to care for persons with spinal cord injury (SCI), schizophrenia, and dementia, which are more debilitating than COPD and impose a higher burden on the family caregivers.^[26-28] The mean caregiver burden was moderate in the present study and more than half of the participants experienced a low burden. This finding contradicts the results of the study conducted by Fa *et al.* who examined caregiver burden in the family caregivers of persons with SCI. The high burden on the family caregivers of persons with SCI has been attributed to the fact that they often do not receive adequate counseling, and support and are therefore unable to fulfill their care responsibilities and adequately meet the needs of their patients and other family members.^[26] This unpreparedness and inability to solve problems put additional pressure on the caregivers.^[27] In the study conducted by Miravittles (2015), the caregivers of persons with COPD with great dependence showed a 39% higher probability of developing health problems, 27% higher likelihood of professional problems, and 23% higher chances of leisure problems compared to those with nondependent patients. Figueiredo *et al.* demonstrated that caring for people with advanced COPD causes a higher subjective burden, more depression, and poorer self-rated mental health than caring for people with early COPD.^[28] The low level of burden perceived by the participants in the present study may be attributed to the fact that most of the caregivers

in the present study were healthy, did not have a formal job and miscellaneous preoccupations, and therefore showed high levels of resilience to care problems and did not feel overwhelmed. Based on the present findings, female caregivers and homemaker experience more burden than others. These findings are consistent with the results reported by Miravittles (2015), and Grant *et al.* The results of the latter study showed that female caregivers and homemaker experience more burden than others because they have less opportunity to relax, meet their friends, and have fun; besides, caregivers homemaker had less time to work outside their home and thus experienced more financial problems.^[2,27]

The mean caregiver burden was higher in caregivers with primary school education. The results of the studies conducted by Fernandez-Calvo *et al.* and Gaioli *et al.*, also show that higher education encourages one to do self-care behaviors and reduces the impact of adversities generated during care.^[25,29] The mean burden was also higher in the caregivers who had been caring for their family member with COPD for over 2 years, and in those with insufficient income. Caregivers could be threatened with social activity dysfunction, fatigue, or exhaustion as the caring duration increased. Therefore, providing social-based services (e.g., respite services, daily care, transportation, and emergency responding services) are suggested as a solution for health promotion.^[20]

In the present study, a relationship was found between caregiver burden with family kinship. This finding is in contrast to the results of Ghaffari *et al.*'s and Gaioli *et al.*'s study.^[20,29] These differences can be explained by discrepancies in the research population. The majority of the caregivers participating in this study were the spouses of the patients. Since the spouses of elderly patients with COPD often suffer from a chronic disease, this limits them in providing care and results in the caring pressure on spouses. In the present study, no relationship was found between caregiver burden and the caregivers' marital status, the severity of COPD, and comorbidities. These findings contradict the results of some earlier studies,^[26,27,30] and this discrepancy might be attributed to the moderate severity of the disease in the majority of the older adults for whom the participants cared. Besides, most caregivers were healthy and therefore had a lower perceived burden.^[31]

CONCLUSION

The results suggest that as resilience increases, caregiver burden decreases. Resilience training interventions can be conducted through workshops or counseling programs to reduce the caregivers' burden and increase their tolerance to the problems arising from care. Future

studies should focus on strategies for improving the resilience of the caregivers of older adults with advanced COPD and other debilitating diseases.

Acknowledgments

This article was derived from a master thesis of ageing nursing with project number 724132718, Babol University of Medical Sciences, Babol, Iran. The authors would like to acknowledge the research deputy at Babol University of medical sciences for their support. We also are thankful of all patients who participated in this study.

Financial support and sponsorship

This study was supported by research deputy at Babol University of medical sciences.

Conflicts of interest

There are no conflicts of interest.

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