

Full Length Research Paper

Prevalence and predictors of burden among family caregivers of the elderly in a Western City in Turkey: a community-based, cross-sectional study

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ABSTRACT

The objective of this study is to assess caregiver burden among family members and to identify risk factors of burden. This was community based study using face-to-face interviews by a trained study team via a semi-structured questionnaire, the 12-item General Health Questionnaire, the Zarit Burden Interview, the Center for Epidemiological Studies Depression Scale. Results: The daughters, sons and daughter-in-laws were the most common caretakers. One in four caregivers experiences caregiver burden and that the age of the elderly adult receiving care and family size affected the caregiver burden. Daughter-in-laws and grandchildren experienced caregiver burden at twice the rate of sons or daughters ($p=0.014$). Almost one in four caregivers had higher median CES-D scores. Early recognition of risks factors of caregiver burden and of health problems in caregivers can provide early support and prevention of caregiver burden. Caregivers should be educated about the risk factors for caregiver burden, support and services in their community.

Keywords: Caregiver, burden, elderly, risk factors.

INTRODUCTION

The proportion of elderly people has increased significantly in recent decades according to a report by the World Health Organization (WHO). In particular, the population of adults 85 years and older was projected to rise 19 million by 2020 and to 40 million by 2050 in European Region (Davies, 2004; Marmot et al., 2010). Correlating with this demographic change, disability and dependency at the end of life are increasing (Davies, 2004; Marmot et al., 2010). The increasing health needs of the elderly require multidisciplinary care, including specialists in therapeutic and palliative care, primary care and social care (Hall et al., 2011). Geriatricians, family physicians, hospitals and care homes provide services to the elderly. However, many elderly adults in the European Region of the WHO live alone and prefer to receive their care and to die in the home (Hall et al., 2011). Caregivers (also known in the literature as 'carers') are unpaid relatives or friends who assist a disabled individual who needs assistance in performing

activities of daily living. The caregiver assists physicians, nurses, and social workers in the identification, prevention, and treatment of the health and social problems experienced by the disabled individual (Wikipedia, 2011; DeFries et al., 2009). In some countries, including Turkey, families, friends, partners, and neighbors have important caregiver roles. The WHO has reported that "*the lack of state-funded infrastructure for the care of older people may place a greater burden of care on families*" (Hall et al., 2011).

Family caregivers experience negative feelings such as depression, burden, poor health by self-report, guilt and worry (Cohen et al., 2002; Sethi et al., 2011). Surveys of family caregivers show that large proportions have mistreated elderly people in their care. According to the European report, at least four million people in the WHO European Region have experienced elder maltreatment in any one year (Sethi et al., 2011). The latest studies of family caregivers have emphasized the importance of understanding the factors that influence a caregiver's ability to care for an elderly adult and informing policy makers, clinicians and nurses to help reduce caregiver burden and improve care for the elderly

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in the future (Bergström et al., 2011; Breitborde et al., 2011; Jankovic et al., 2011; Krevers and Oberg, 2011; McPherson et al., 2011; Parvataneni et al., 2011; Stella et al., 2011; Williams et al., 2011). The WHO has encouraged the performance of needs assessments and studies of the burden on family caregivers. Furthermore the WHO recommends using the results of the surveys to provide financial assistance and educational programs for caregivers, in order to increase their knowledge and confidence (Hall et al., 2011).

In Turkey, legal regulations regarding care services provided at home have been made. In case of a service demand, mobile teams (professional caregivers, and especially nursing teams) deliver care services to people with advanced diseases that can receive care in the home (Resmi Gazete-official newspaper, 2011). However, a nationally integrated service model for care of the elderly without advanced health problems or who do not request services and a database that supports this model, are not yet established. For these reasons, most of the old people in Turkey prefer to live at home with their families (sons, daughters, etc) instead of living in a nursing home or taking institutional care. In addition, the uncertainty surrounding the social system in Turkey raises questions for both the elderly and caregivers.

In our study of Aydin, we aimed to determine the prevalence of non-professional (family) caregiver burden, to determine the effects of burden on caregiver health, to determine the risk factors for experiencing greater burden and to discuss options for decreasing caregiver burden.

MATERIALS AND METHODS

Sample selection

This cross-sectional study was conducted between September and October 2011 in Aydin, a city in western Turkey with a population of 989 862 people. Of those people, 188 337 were located within the municipal boundary (TUIK, 2011). The number of people aged 65 years and above was approximately 19 399 (10.3%) in the city center (TUIK, 2011a). Of the entire population of Turkey, adults 65 years and older make up 7.2% of the population (TUIK, 2011). Aydin is known as a "retiree city" because the proportion of elderly population was higher than the average.

There is only one nursing home for the elderly in the city center, and older people with a deceased spouse typically live with relatives or alone. Because there are no data that describe the frequency at which caregivers live with the older adults that they care for in our research area, the study procedure was planned in two stages. First, the residences of adults 65 years and older were identified. The anticipated population proportion of caregivers who take care of the elderly was determined using the potential support ratio (PSR=adults 15-64 years

old/adults 65 years and older) (Mandiracioglu, 2010). This ratio was shown to be approximately 10.0% in Turkey (United Nations, 2001). In the study, the sample size of 786 homes of elderly adults was calculated using a PSR of 10.0%, an error margin of $d=0.03$ and the design effect as two at a 95% CI. Then, multi-stage sampling methods were used for sampling.

Cluster sampling method

Neighborhoods were used as cluster units. Aydin has 20 neighborhoods in the city center. The neighborhoods were classified into four groups according to their location within the city: western, eastern, northern and southern.

Simple random sampling method

Two neighborhoods from each region (eight in total) were selected for the study using a simple random sampling method. A leader for each neighborhood kept records of the residences in every neighborhood. The records were listed according to the age of the residents, producing a list of elderly residents.

Systematic sampling method

Residences were selected using a systematic sampling method from the list of elderly residents according to the proportion of elderly residents from each neighborhood. A *caregiver was defined as* any relative who is not a professional or member of a social support network, who lives in the same home as an elderly adult and is the primary person responsible for care of the elderly adult. The group of caregivers older than 18 years consisted of the following categories: children (sons and daughters), daughter-in-laws, grandchildren and other close relatives. Informal caregivers were eligible if they were living with the elderly adult or were in close contact with them several times per week. In this study, the following definition of burden was used: any hard task, whether or not it is related to a health problem, that creates feelings of anxiety and frustration, leading to changes in familial and social relationships and professional life.

Exclusion criteria

For caregivers included the presence of a communication or perception problem (for example dementia or schizophrenia), visual or hearing loss and Alzheimer's disease. Spouses and professional caregivers were also excluded from the study. Reason for excluding spouses in this study was that, the age of the spouses might be close to the age of the elderly and the spouse might have

the same need for care services. In that case there would be doubt in the reliability of the responses. Using these criteria, 262 caregivers were included in the study.

Study procedure

Ethical considerations

The study protocol was designed in compliance with the Helsinki declaration (Seul, October 2008) and approved by Adnan Menderes University Rectorate connected with approval of the Provincial Local Administration Committee of Aydin Governorship and verbal informed consent was obtained from all participants. The department of public health of medical faculty of Adnan Menderes University is responsible for the design and conduct of the study.

Data collection

Data were collected using face-to-face interviews conducted by a trained study team. A semi-structured questionnaire and three scales were used to collect data from the individuals. A detailed description of the instruments is provided below. The researchers introduced themselves to participants before the interview and clearly expressed the purpose of the study. To ensure privacy, the interviews were conducted in a room where the investigator and the participant were alone.

Socio-demographics

The socio-demographics section included questions about age, marital status, education, family type, presence of social insurance, family income, social activity of the caregiver, perceived health status of the elderly and relationship of the caregiver to the elderly adult. The semi-structured questionnaire was developed by two public health specialists who were interested in this topic in Turkish. Questions were selected from the questionnaires of previous studies carried out in Aydin and also references on the subject. Prior to data collection, the questionnaire was pretested in a pilot study of 10 caregiver who were not included in this sample. Necessary modifications such as sentence rearrangement, using simpler expressions, and reducing the number of choices for some questions were made.

Instruments

The 12-Item General Health Questionnaire (GHQ-12)

The GHQ-12 was used to assess for psychiatric morbidity among the caregivers. The instrument was developed by David P. Goldberg, and a validation study was conducted

by C. Kiliç et al. in Turkey (1997) (Kiliç et al., 1997). Each item is scored from 0 to 3 (0= 'not at all', 1='no more than usual', 2='rather more than usual' and 3='much more than usual'). The total score was calculated using the binary scoring method (with the two least symptomatic answers scoring 0 points and the two most symptomatic answers scoring 1 point). A cutoff point of 1/2 was used for the evaluation of psychiatric morbidity among caregivers.

The Zarit Burden Interview (ZBI)

Care giver burden was assessed using the Zarit scale, which has 22 questions about the impact of the disorders of elderly on the quality of life of their caregivers. The scale was developed by Zarit, Reever ve Bach-Peterson, and a validation study was conducted by Inci F.H. and Erdem M. in Turkey (2008) (Inci and Erdem, 2008). The score of each response ranged from 0 (never) to 4 (always). After the total score was calculated, a cutoff of 28 was used to assess the presence of caregiver burden. Caregivers with scores of 28 points or less were considered to have "no burden," and those with scores of 29 points or more were considered to have "burden." The cutoff point was determined from the 75th percentile value. In the literature there were many cutoff points based on the health status of the elderly adult. Schreiner et al. assigned a cutoff score of "25" for caregivers of individuals with acute stroke and COPD, which correctly identified 77% of high burden stroke caregivers (ZBI, 2011). In a study evaluating the association between urinary incontinence in elderly patients and caregiver burden, a cutoff of 28 was used, as in our study (Tamanini et al., 2011). To cover the 75th percentile, 28 was selected as the cutoff point.

Center for Epidemiological Studies Depression Scale (CES-D)

The CES-D was used to assess for depressive symptoms in the caregivers. This scale has been used extensively in community-based surveys to describe and explain the prevalence of depression in the general population. The CES-D was developed by The American National Mental Health Institute, and a validation study was conducted by Tatar and Saltukoglu in Turkey (2010) (Tatar and Saltukoglu, 2010). The scale consists of 20 questions. The scores for each response are defined as "0= never or less than 1 day"; "1=Occasionally or 1-2 days"; "2=A few times or 3-4 days"; "3=frequently or 5-7 days". The total score ranges from 0 to 60. Higher scores are associated with depressive symptoms.

Caregiver suggestions regarding elder care

We asked the caregivers four open-ended questions about providing care to older adults: "How would you

describe the health status of the elderly adult you care for?"; "What is your opinion about who should provide care to the elderly?"; "What is your opinion about where care for the elderly should take place?"; "What are your suggestions about care for older adults?"

Statistical analysis

SPSS 19.0 for Windows® software (IBM, Serial Number 10241440) was used for statistical analysis of the data. Means, standard deviations, medians, 25th and 75th percentile values and percentages were used in the evaluation of the descriptive statistics. In the analytical evaluation, the chi-squared test was used to compare the data collected by counting. Student's t-test was used to compare the means obtained from continuous data. Pearson's correlation was used to determine the relationship between scores obtained from the CES-D and the ZBI. Continuous data were analyzed using the Kolmogorov-Smirnow test to evaluate normal distribution. After univariate analysis, logistic regression was performed to determine possible risk factors for caregiver burden. *Dependent variables* included the presence of caregiver burden; *independent variables* included the educational level, family type, and monthly income of the caregiver, the perceived health status of the elderly according to the caregivers' response, the social activity of the caregiver and the age of the elderly (classified according to the mean age of the elderly, such as 65-70 and greater than 71 years). The results of logistic regression analysis were provided as relative risks (odds ratio, OR) and 95% confidence interval (CI). The Backward-Wald method was used as the regression model. A $p < 0.05$ was considered significant.

RESULTS

Sociodemographic data

The mean age of the caregivers was 39.45 ± 10.65 (range, 16-63). From a total of 262 participants, 63.7% were female and 36.3% were male. Of the caregivers, 72.5% were living in a flat, and 27.5% were living in a detached house. Of the participants, 63.7% had children and the mean number of children was 1.90 ± 0.96 (range 0-5). Almost 80.0% of the caregivers considered themselves an "active person in society". Only 20.0% considered themselves "socially inactive". Some of the sociodemographic characteristics of the study population were given in Table 1. Most of the caregivers were nuclear family members (81.6%). Daughters (33.4%), sons (28.3%) and daughter-in-laws (16.6%) were predominantly responsible person for the care of an older adult. A description of the primary caregiver was shown in Table 2.

Family caregivers burden

Approximately one in four (24.5%) participants experienced caregiver burden. The median score for caregiver burden was 17 (10-28). When each item on the scale was analyzed, higher scores were found for "I feel that I should be doing more for my relative" (52.7%); "I feel my relative is dependent on me" (26.7%); and "I feel that my relative seems to expect me to take care of him/her, as if I was the only one he/she could depend on" (28.3%).

Factors affecting caregiver burden were shown in Table 3. Education, family type, monthly family income, perceived health status of the elderly adult, social activity and age of the elderly were statistically significant factors that influenced caregiver burden ($p < 0.05$). In the final model of the logistic regression analysis, family type and age of the elderly were found as significant risk factors for caregiver burden. Caregivers who had a large family experienced an increase in risk of 5.010 (95% CI [1.060-23.679]; $p = 0.042$), and those who gave care for elderly adults 70 years and older experienced an increase in risk of 5.614 (95% CI [1.617-19.492]; $p = 0.007$).

Effects of burden on caregiver health

We found that daughter-in-laws and grandchildren experienced caregiver burden at rates two times greater than in children ($p = 0.014$). Rates of caregiver burden were 19.8%, 18.8% and 18.4% for daughters, sons and non-official workers, respectively. On the other hand, rates of caregiver burden were 42.5% among daughter-in-laws and 41.2% among grandchildren. Caregiver burden according to the relationship to the elderly adult is provided in Figure 1.

Caregivers provided information about their own health status. Of the caregivers, 26.8% had diagnosed chronic disease, 6.9% had some form of physical disability and 22.9% took medications on a daily basis. The caregivers also described the health status of the older adults for whom they provide care. The health status of the elderly adult was described as good by 71.1% of the caregivers and bad by 28.9%.

The median caregiver score was 0 on the GHQ (0-2) and 13 on the CES-D (8-20). Using a cutoff of $\frac{1}{2}$ for the GHQ, 28.6% of the caregivers were found as having poorer health status from other caregivers who had greater GHQ. A statistically significant positive correlation was found between CES-D and Zarit Burden scores ($r: 0.449$; $p < 0.01$). Interestingly, 0.8% of participants stated that they received counseling regarding elderly, and 5.0% received psychological support.

Caregivers' suggestions for care of older adults

In the last section of the questionnaire, caregivers

Table 1. Socio-demographic characteristics of the caregivers, Aydin-Turkey, 2011

	n	%
Gender (n:257)		
Female	162	63.7
Male	95	36.3
Age Group (n:261)		
15–20	10	3.8
21–60	247	94.7
61 years old and above	4	1.5
Educational Status (n:262)		
Not literate	9	3.4
Primary School	86	32.8
Secondary school and above	167	63.8
Occupational Status (n:261)		
Housewife	107	41.0
Employed	117	44.8
Unemployed	17	6.5
Pensioners	20	7.7
Family Type (n:256)		
Nuclear	209	81.6
Extended	47	18.4
Marital Status (n:262)		
Married	171	65.3
Divorced	91	34.7
Social Security health insurance (n:262)		
Yes	201	76.7
No	61	23.3
Monthly income of the family (n:195)		
Low*	127	65.1
High*	68	34.9
Owner of the house/flat (n=260)		
Caregivers' house	81	30.9
Living as a tenant	55	20.9
Elderlies house	86	32.8
Other (relatives, sons, daughters, etc)	38	14.5
Regular income (n=247)		
Yes	158	64.0
No	89	36.0

*base wage rate in Turkey

Table 2. Description of the primary caregivers, Aydin-Turkey, 2011

Relationship with the elderly	n (258)	%
Daughter	86	33.4
Son	73	28.3
Daughter-in-law	43	16.6
Grandchildren	17	6.6
Neighbour	16	6.2
Caretaker	12	4.6
Siblings	4	1.6
Friends	1	0.4
Other relatives*	6	2.3

*nephew, uncle's wife, mother-in-law

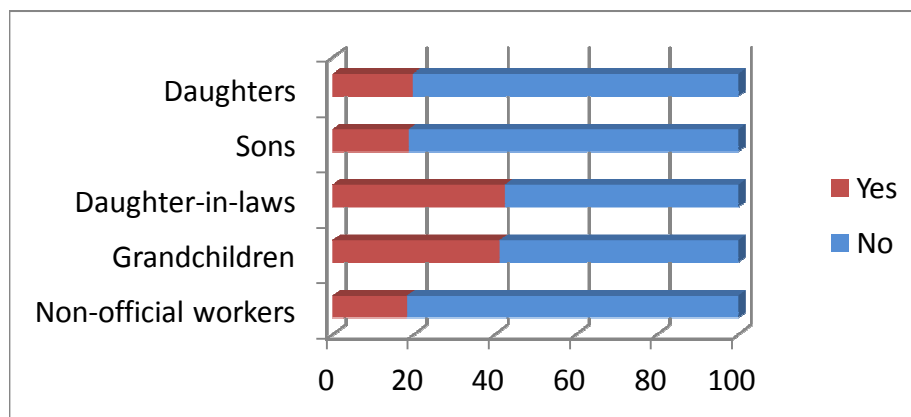


Figure 1. Burden according to the relationship to the recipients

provided their own suggestions about care for the elderly. Of the caregivers, 84.6% said that “families or relatives” have to provide care for the elderly, 11.2% said “governorship or educated personnel” should provide this care, and 4.2% said “non-official workers” should provide it. Of 74 participants, 89.8% said that the elderly should receive care at home (either their own home or in a relative’s home), 8.2% said that they should receive care at a rest home or nursing home, and 2% said that they should receive care wherever the elderly adult felt best. Of the 74 participants who provided suggestions about elder care, 33.8% said that elderly should be treated with more empathy and respect, 29.5% said that the state should provide financial and moral support to elderly adults and caregivers and 15.4% stated that the health care services for elderly adults should be improved.

DISCUSSION

The elderly population is increasing in Turkey and throughout the world. This increase is associated with increases in chronic diseases, the number of dependent adults and the burden of disease and caregiving. Scientific researchers have begun to concentrate on healthy aging, improving quality of life, healthy and safe communities, and improving health status and activity. Societies are calculating the cost of this increasing burden in order to make decisions about the service models that will be used in the future. Countries with a strong database have service networks that include all individuals but it was not established in our country yet.

The life expectancy in Turkey is 74.5 years (72.0 years for men and 77.1 years for women) (TUIK, 2011c). Ten-year plans must be made to provide for healthy living environments and delivery of adequate and accessible care for approximately 20,000 adults older than 65 living in the provincial center of Aydin (WHO, 2011). In our

study in Aydin, 262 of 760 residents within the city center had a caregiver (34.5%). A rough estimate of the rate of family caregivers in Aydin can be calculated from this study. Of 20,000 elderly adults living in the Aydin city center, 6,900 live with a caregiver. The level of care services will differ for each elderly adult and residence. Therefore, features of the caregivers including training, social supports, and other requirements and interventions to decrease the caregiver burden will vary.

The Aydin study is a community-based study that aimed to provide useful results. Pincuart and Sörensen (2007) published a meta-analysis of studies published from 1986 to 2006 on caregiving. The results of the meta-analysis showed a deficiency of studies of community-based caregivers (Pinquart and Sörensen, 2007). Studies of caregiver burden associated with the care of elderly adults with serious health problems are frequently found in the literature, especially for the caregivers of adults with advanced diseases such as cancer, heart disease and COPD; urinary incontinence and dementia have been studied even more (Bergström et al., 2011; Breitborde et al., 2011; Jankovic et al., 2011; Krevers and Oberg, 2011; McPherson et al., 2011; Parvataneni et al., 2011; Stella et al., 2011; Williams et al., 2011).

According to the results of some studies, approximately 60.0-77.0% of caregivers are women, while this rate was 63.7% in our study (Bergström et al., 2011; Carod-Artal et al., 2009; Christofolletti et al., 2011; Pinquart and Sörensen, 2007). Additionally, in one literature review, caregivers were predominately female spouses with a mean age ranging from 54 to 63 years (Harkness and Tranmer, 2007). Sons and daughters were the most common caregivers rankings in our study (Christofolletti et al., 2011; Karlıkaya et al., 2005; Yüksel et al., 2007). In a study from in China, Ken et al. (2010) reported that “sons/daughters” are the most suitable caregivers (Ken et al., 2010). In general, woman in developing countries, like Turkey, undertake the task of

providing care. Occasionally, a spouse, daughter or daughter-in-law assists with this task.

According to the results from our study of Aydin, the median score for caregiver burden was 17 (10-28), and one in four caregivers had a greater degree of caregiver burden. In a systematic review of 24 articles on caregiver burden among caregivers of stroke patients, the prevalence of burden ranged from 25–54% (Rigby et al., 2009). In a Brazilian study, the ZCBI mean score was 27.2 (range: 0-70) and approximately one in four (26.6%) stroke caregivers experienced high burden (Carod-Artal et al., 2009). In a study from Spain, an intense burden was found in 67.4% of the caregivers, while only 10.0% of experienced no burden while giving care to elderly adults with advanced disease (González-Pisano et al., 2009). In a study from China, the median Zarit score was 33, and the rate of caregivers who scored above this value was 70.8% (Ken et al., 2010). In a Turkish study of caregiver burden among the caregivers of patients with Parkinson's disease, the mean value of ZBI was 31.1 ± 20.85 (0-88) (Yüksel et al., 2007). In the study by Yüksel et al. (2007), each item of the scale was analyzed, and higher scores (>2) were found in questions 7, 8, 14, and 20 (Yüksel et al., 2007). In our study, higher scores were found for questions 8, 14, 20 and 21. Data showed that caregivers felt that they needed to do more for the adults that they care for. In our study of Aydin, the rate of caregivers burden (24.4%) was lower than in other studies. Because different cutoff values are used to define caregiver burden in different studies, we are limited in our ability to compare studies. The main objective of this study was to define the extent of caregiver burden, to identify factors associated with burden and to make suggestions to support caregivers in Turkey, where the life expectancy has increased. The caregiver burden for caregivers of elderly people with advanced health problems will be high. In our study, caregiver burden among caregivers of elderly adults without any advanced disease apart from the normal disabilities associated with aging were consistent.

The comparisons that can be made between our study and other studies were limited because we did not include spouses. Spouses have been included, and their levels of caregiver burden have been evaluated in many studies of family caregivers. In a Brazilian study, caregiver burden for caregivers of stroke patients was significantly higher for wives than for husbands or other relatives. The rate of caregiver burden was 31.4% among wives and 22.6% in other relatives, a group that consisted mostly of sons and daughters (Carod-Artal et al., 2009). According to our study, daughter-in-law and grandchildren experienced the highest levels of caregiver burden (42.5% and 41.2%, respectively). Daughter-in-laws are defined as the "second daughter of the home" in Turkish society. Affection, respect and responsibility to the elders are expected from the daughters and the daughter-in-laws. In addition to the elderly adults in their

family, the daughter-in-law also try to care for the elders of their spouses' family. Occasionally, she must care for more than one person at a time. In Turkish society, grandchildren have the responsibility to maintain the family lineage and deal with concerns related to the family's future. An emotional bond is established between the grandchildren and the elders of the family. They may have to care for their own parents, spouses and children along with the most senior adults in the family. This traditional relationship makes the Aydin study different from the other studies of caregivers burden.

In this study, the results of univariate analyses demonstrated that educational status, family size, family income, social status of the caregiver, age of the elderly adult and perceived health status of the elderly were all factors affecting caregiver burden. Although some studies have found an association between burden and patient sociodemographics or health characteristics, other studies have not (Costa-Requena et al., 2011; Garlo et al., 2010). Multivariate analysis showed that older age of the elderly adult (70 years old and above) and larger family size (extended family) affected caregiver burden. A decline in physical functioning occurs with increasing age, and elderly adults become more dependent on others to meet their needs (Toprak et al., 2002). Therefore, with older age, increased caregiver burden is expected. In general, the elderly live with their daughters or sons – especially if their spouse is deceased – in developing countries like Turkey because of the traditional social structure. In large families, factors such as financial constraints, work, childcare and high levels of responsibility increase the burden of care.

Almost one in four participants (28.6%) reported poorer psychiatric morbidity than others, and their median CES-D scores were higher than others whose health status were good. The CES-D scores reflected levels of depression score, which increases with increasing caregiver burden. Studies show that becoming a caregiver creates physical and emotional strain (Blonder et al., 2007; Chung et al., 2010; Forsberg-Wärleby et al., 2004; Wilz and Kalytta, 2008). In this situation, the caregiver's social supports, need for more help with daily tasks, and family relationships influence caregiver burden and quality of life.

Of the 262 participants in our study, 89.8% said that elderly adults should be cared for at home (either the home of the elderly adult or a relative) and that "family or relatives" should provide care for the elderly adult. Similar to this study, in a study by Ken et al. (2010), approximately 50% of elderly adults did not want to enter an institution for care, and 80% of the caregivers wanted to continue providing care in the home (Ken et al., 2010).

CONCLUSION

Our study results showed that one in four caregivers

experiences caregiver burden and that the age of the elderly adult receiving care and family size affected the caregiver burden. Approximately one third of the caregivers stated that the state must provide financial and moral support to elderly adults and caregivers. There is a need for a service model that integrates social and medical services and provides care for both healthy and sick elderly people. Caregiver strain can reduce the quality of care provided to elderly adults (Amendola et al., 2011). Thus, early recognition of caregivers at risk of caregiver burden and the associated health problems and early support may prevent or alleviate caregiver burden. Caregivers should be trained and informed about the possible health consequences of caring for the elderly and about organizations from which they can receive social support because this training may reduce the negative health impacts of caregiving.

Declaration of interest

There are no conflicts of interest

REFERENCES

- Amendola F, Oliveira MA, Alvarenga MR (2011). Influence of social support on the quality of life of family caregivers while caring for people with dependence. *Rev Esc Enferm USP*. 45(4):884-889.
- Bergström AL, Eriksson G, von Koch L, Tham K (2011). Combined life satisfaction of persons with stroke and their caregivers: associations with caregiver burden and the impact of stroke. *Health Qual Life Outcomes*. 9:1.
- Blonder LX, Langer SL, Pettigrew LC, Garrity TF (2007). The effects of stroke disability on spousal caregivers. *NeuroRehabilitation*. 22: 85–92.
- Breitborde NJ, Moreno FA, Mai-Dixon N, Peterson R, Durst L, Bernstein B, Byreddy S, McFarlane WR (2011). Multifamily group psycho education and cognitive remediation for first-episode psychosis: a randomized controlled trial. *BMC Psychiatry*. 11: 9.
- Carod-Artal FJ, Coral LF, Trizotto DS, Moreira CM (2009). Burden and perceived health status among caregivers of stroke patients. *Cerebrovasc Dis*. 28(5):472-480.
- Christoforetti G, Oliani MM, Bucken-Gobbi LT, Gobbi S, Beinotti F, Stella F (2011). Physical activity attenuates neuropsychiatric disturbances and caregiver burden in patients with dementia. *CLINICS*. 66(4):613-618.
- Chung ML, Pressler SJ, Dunbar SB, Lennie TA, Moser DK (2010). Predictors of depressive symptoms in caregivers of patients with heart failure. *J Cardiovasc Nurs*. 25(5): 411-419.
- Cohen CA, Colantonio A, Vernich L (2002). Positive aspects of caregiving: rounding out the caregiver experience. *Int J Geriatr Psychiatry*. 17(2): 184-188.
- Costa-Requena G, Cristófol R, Cañete J (2011). Caregivers' morbidity in palliative care unit: predicting by gender, age, burden and self-esteem. *Support Care Cancer*.
- Davies E (2004). What are the palliative care needs of older people and how might they be met? Health Evidence Network Report. WHO Regional Office for Europe, Copenhagen.
- DeFries EL, McGuire LC, Andresen EM, Brumback BA, Anderson LA (2009). Caregivers of Older Adults With Cognitive Impairment. *Preventing Chronic Disease*. 6 (2):A46.
- Forsberg-Wärleby G, Möller A, Blomstrand C (2004). Psychological well-being of spouses of stroke patients during the first year after stroke. *Clin Rehabil*. 18: 430–437.
- Garlo K, O'Leary JR, Van Ness PH, Fried TR (2010). Burden in caregivers of older adults with advanced illness. *Journal of the American Geriatrics Society*. 58(12):2315–2322.
- González-Pisano AC, Granado-Villacé R, García-Jáñez E, Del Cano-González C, Fernández-Fernández MA (2009). Quality of life related to health in caregivers of dependent people in two rural areas of León. *Enferm Clin*. 19(5): 249-257.
- Hall S, Petkova H, Tsouros AD, Costantini M, Higginson IJ (Eds.) (2011). Palliative care for older people: better practices. WHO Regional Office for Europe, Copenhagen.
- Harkness KI, Tranmer JE (2007). Measurement of the caregiving experience in caregivers of persons living with heart failure: a review of current instruments. *J Card Fail*. 13(7):577-587.
- Inci FH, Erdem M (2008). Bakım verme yükü ölçeği'nin türkçe'ye uyarlanması geçerlilik ve güvenilirliği. *Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi*. 11(4):85-95 (in Turkish).
- Jankovic J, Yeeles K, Katsakou C, Amos T, Morriss R, Rose D, Nichol P, McCabe R, Priebe S (2011). Family caregivers' experiences of involuntary psychiatric hospital admissions of their relatives, qualitative study. *PLoS One*. 6(10): e25425.
- Karlıkaya G, Yüksel G, Varlıbaş F, Tireli H (2005). Caregiver burden in dementia: a study in the Turkish population. *The Internet J. Neurol*. 4 (2).
- Ken K, Okuno J, Fukasaku T, Tomura S, Yanagi H (2010). Factors affecting burden of caregivers for the elderly of Han Chinese and the Korean minority living in a community in northeast China. *Nihon Koshu Eisei Zasshi*. 57(9):816-824.
- Kihç C, Rezaki M, Rezaki B, Kaplan I, Özgen G, Sagduyu A, Öztürk MO (1997). General Health Questionnaire (GHQ12 and GHQ28): psychometric properties and factor structure of the scales in a Turkish primary care sample. *Social Psychiatry and Psychiatric Epidemiology*. 32 (6):327-331.
- Krevers B, Oberg B (2011). Support/services and family carers of persons with stroke impairment: perceived importance and services received. *J. Rehabil. Med*. 43(3): 204-209.
- Mandiracıoğlu A (2010). Dünyada ve Türkiye'de yaşlıların demografik özellikleri (Demographic characteristics of the elderly population in Turkey and the world). *Ege Tıp Dergisi / Ege J. Med*. 49(3) Ek / Supplement: 39-45 (in Turkish).
- Marmot M and his Team (2010). Interim first report on social determinants of health and the health divide in the WHO European Region – Executive summary, European Social Determinants and Health Divide Review. WHO Regional Office for Europe, Copenhagen.
- McPherson CJ, Wilson KG, Chyurlia L, Leclerc C (2011). The caregiving relationship and quality of life among partners of stroke survivors: a cross-sectional study. *Health Qual Life Outcomes*. 9(1):29.
- Parvataneni R, Polley MY, Freeman T, Lamborn K, Prados M, Butowski N, Liu R, Clarke J, Page M, Rabbitt J, Fedoroff A, Clow E, Hsieh E, Kivett V, Deboer R, Chang S (2011). Identifying the needs of brain tumor patients and their caregivers. *J. Neurooncol*. 104(3): 737-744.
- Pinquart M, Sörensen S (2007). Correlates of physical health of informal caregivers: a meta-analysis, *Journal of gerontology: psychological sciences*. The Gerontological Society of America. 62B(2):126–137.
- Resmi Gazete (2011). Evde Bakım Hizmetleri Sunumu Hakkında Yönetmelik. <http://www.resmigazete.gov.tr/main.aspx?home=http://www.resmigazete.gov.tr/eskiler/2005/03/20050310.htm&main=http://www.resmigazete.gov.tr/eskiler/2005/03/20050310.htm> (achived on 09 November 2011) (in Turkish)
- Rigby H, Gubitz G, Phillips S (2009). A systematic review of caregiver burden following stroke. *Int. J. Stroke*. 4(4):285-292.
- Sethi D, Wood S, Mitis F, Bellis M, Penhale B, Marmolejo II, Lowenstein A, Manthorpe G, Kärki FU (Eds) (2011). European report on preventing elder maltreatment. WHO Regional Office for Europe, Copenhagen.
- Stella F, Canonici AP, Gobbi S, Galduroz RF, Cação Jde C, Gobbi LT (2011). Attenuation of neuropsychiatric symptoms and caregiver burden in Alzheimer's disease by motor intervention: a controlled trial. *Clinics (Sao Paulo)*. 66(8):1353-1360.

- Williams AM, Eby JA, Crooks VA, Stajduhar K, Giesbrecht M, Vuksan M, Cohen SR, Brazil K, Allan D (2011). Canada's Compassionate Care Benefit: is it an adequate public health response to addressing the issue of caregiver burden in end-of-life care? *BMC Public Health*. 11: 335.
- Tamanini JTN, Santos JLF, Lebrao ML, Duarte YAO, Laurenti R (2011). Association between urinary incontinence in elderly patients and caregiver burden in the City of Sao Paulo/Brazil: health, wellbeing, and ageing study. *Neurourology and Urodynamics*. 30:1281–1285.
- Tatar A, Saltukoglu G (2010). The adaptation of the ces-depression scale into turkish through the use of confirmatory factor analysis and item response theory and the examination of psychometric characteristics. *Bulletin of Clinical Psychopharmacology*. 20:213-227.
- Toprak İ, Soydal T, Bal E, İnan F, Aksakal N, Altinyollar H, Babalıoğlu N, Coşkun Ö, Çakır B, Demirören M, Doğan S, Evci D, Kurtuluş A, Şafak N, Yüksel B (2002). Yaşlı Sağlığı. T.C. Sağlık Bakanlığı, Temel Sağlık Hizmetleri Genel Müdürlüğü, Pelin Ofset, Ankara (in Turkish).
- TUIK (2011a). İl, yaş grubu ve cinsiyete göre nüfus, Adrese Dayalı Nüfus Kayıt Sistemi, http://www.tuik.gov.tr/VeriBilgi.do?tb_id=39&ust_id=11 (achived on 15 August 2011) (in Turkish)
- TUIK (2011b). Adrese Dayalı Nüfus Kayıt Sistemi 2010 yılı sonuçları, T.C. Başbakanlık Türkiye İstatistik Kurumu (TUIK) Haber Bülteni, Sayı:19, 28 Ocak 2011, Ankara (in Turkish).
- TUIK (2011c). Demografik göstergeler, Nüfus projeksiyonları ve tahminleri, http://www.tuik.gov.tr/VeriBilgi.do?tb_id=39&ust_id=11 (achived on 02 November 2011) (in Turkish)
- United Nations (2001). World Population Ageing: 1950-2050, Countries or areas. Department of Economic and Social Affairs Population Division of United Nations, New York. ST/ESA/SER.A/207.
- Yüksel G, Varlıbaş F, Karlıkaya G, Şıpka Y, Tireli H (2007). Parkinson hastalığında bakıcı yükü (caregiver burden in parkinson's disease) *Parkinson Hast. Hareket Boz. Der.* 10(1-2), 26-34(in Turkish).
- Wikipedia (2011). Caregiver, <http://en.wikipedia.org/wiki/Caregiver>, achived on 26 Oct 2011.
- Wilz G, Kalytta T (2008). Anxiety symptoms in spouses of stroke patients. *Cerebrovasc Dis.* 25:311–315.
- WHO (2011). 10 facts on ageing and the life course, <http://www.who.int/features/factfiles/ageing/en/index.html>, (achived on 09 November 2011).
- ZBI (2011). Zarit Burden Interview (ZBI), Rehabilitation Measures Database, <http://www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=938> (achived on 01 November 2011)