

Research Paper

Association of Personality Traits and Self-efficacy With Caregiver Burden in Family Caregivers of Frail Elderly: A Cross-sectional Study



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ABSTRACT

Background and Purpose: Family caregivers play a crucial role in the long-term care system by providing the most supportive services to frail elderly individuals. Previous studies indicate that higher self-efficacy and certain personality traits are associated with reduced caregiver burden. The present study aimed to examine the association between self-efficacy and personality traits with caregiver burden among family caregivers of frail elderly residents living in Garmeh County, North Khorasan Province, Iran, in 2025.

Materials and Methods: This cross-sectional study was conducted on 243 family caregivers selected through a two-stage random sampling method. Data were collected using a demographic information form, the 17-item general self-efficacy scale (GSE-17), the caregiver burden inventory (CBI), and the 10-item personality inventory (TIPI). Data were analyzed in SPSS software, version 26 using independent t-tests, analysis of variance (ANOVA), Pearson correlation, and multiple linear regression, with a significance level at $P \leq 0.05$.

Results: The mean age of the caregivers was 51.6 ± 11.3 years, with 90.5% female and 76.1% married. A significant negative correlation was found between self-efficacy and caregiver burden ($r = -0.56$, $P < 0.001$), as well as between the personality dimensions of extraversion ($r = -0.67$, $P \leq 0.05$) and openness to experience ($r = -0.70$, $P \leq 0.05$) with caregiver burden. Multiple linear regression identified history of psychiatric visit ($\beta = -0.31$, $P < 0.05$), general self-efficacy ($\beta = -0.10$, $P < 0.05$), extraversion ($\beta = -0.16$, $P = 0.05$), openness to experience ($\beta = -0.32$, $P < 0.05$), and conscientiousness ($\beta = -0.14$, $P = 0.05$) as significant predictors of caregiver burden.

Conclusion: The findings revealed a significant inverse association between self-efficacy and caregiver burden, suggesting that enhancing self-efficacy may reduce caregiver burden. However, interventional studies are needed to confirm this association. Moreover, designing supportive interventions tailored to caregivers' personality traits is recommended to reduce caregiver burden and promote family wellbeing effectively.

Keywords: Self-efficacy, Personality, Caregiver burden, Caregivers, Frailty, Aged

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Introduction

Aging is a natural and inevitable stage of life that is rapidly expanding due to increased life expectancy, declining birth rates, and socio-economic development [1]. This accelerating global aging trend is particularly significant, as it is accompanied by widespread geriatric syndromes that impose substantial healthcare and caregiving burdens on families and health systems [2, 3]. One of the most critical geriatric syndromes is frailty, characterized by decreased physiological resilience to stressors and associated with adverse outcomes, such as disability, functional decline, increased dependency, and reduced quality of life (QoL) [4, 5]. Its prevalence in community-dwelling older adults in Asian countries, based on the frailty phenotype, is estimated at 28.0% (95% confidence Interval [CI], 21.3%, 35.3%) [6].

Numerous studies have demonstrated considerable caregiver burden when caring for frail elderly individuals, arising from financial responsibilities, role changes, assistance with activities of daily living, and managing behavioral issues, which can lead to decreased mental health, increased anxiety, maladaptive coping strategies, and reduced quality of care for both caregivers and care recipients [7-9]. This burden can decrease mental health, increase anxiety, maladaptive coping strategies, reduce quality of care, and diminish QoL for both caregiver and care recipient [10, 11]. Despite the availability of formal care services, the primary caregiving role remains with informal family caregivers, who often provide care without formal training and at no cost [12]. Pesantes et al. found that about 95% of the caregiving burden for dependent and disabled individuals falls on family members [13]. This condition exposes family caregivers to diverse physical, emotional, financial, and social challenges [14]. Therefore, identifying factors associated with caregiver burden among family caregivers is crucial.

Research indicates that personal resources and coping abilities play a significant role in reducing caregiver burden [15, 16]. For example, personality traits influence how individuals respond to stress and behave in various situations [17]. Personality is defined as an organized, stable set of relatively enduring characteristics that distinguish individuals [18]. It affects information processing and resistance to opposing views, which are important for caregivers who must make difficult decisions or face conflicting information [19]. Caregivers with higher neuroticism report greater caregiver burden and health problems, while those with higher extraversion scores

tend to have better physical and mental health [20, 21]. However, targeting personality traits alone may be limited in effectiveness because they are relatively stable after age 30, highlighting the need to explore other flexible resources that influence caregiver burden [22].

Self-efficacy, as defined by Bandura, refers to an individual's belief in their capability to execute the actions necessary to manage prospective situations and exert control over events [23]. Higher self-efficacy is associated with greater persistence in the face of challenges, lower perceived stress, and more effective regulation of emotional states; it plays a particularly central role among caregivers, who frequently encounter challenging and unpredictable situations [24]. In this context, studies on family caregivers have demonstrated that greater self-efficacy is linked to improved QoL, enhanced psychological well-being, and better sleep quality among those caring for older adults with chronic illnesses and dementia [25, 26].

Given the strong preference of many older adults for aging in place, the role of family caregivers in contemporary healthcare systems has become increasingly prominent, and the resulting caregiver burden warrants special attention. In this regard, conducting targeted research to identify factors that effectively reduce caregiver burden and enhance care quality is essential, ultimately contributing to the preservation of older adults' independence and health. A review of the research literature indicates that most studies on caregiver burden have focused on caregivers of individuals with specific diseases, such as dementia or cancer. In contrast, dedicated investigations into family caregivers of frail elderly, characterized by heightened sensitivity to relatively minor stressors, greater dependency, and elevated risks of hospitalization and mortality, remain highly limited, particularly in Iran. Furthermore, examining the roles of psychological factors, such as the big five personality traits and self-efficacy as a positive psychological resource, can provide deeper insights into the determinants of caregiver burden and pave the way for the development of person-centered, evidence-based educational and support interventions. Accordingly, the present study aimed to investigate the associations among self-efficacy, personality traits, and caregiver burden among family caregivers of frail elderly in Garmeh County, North Khorasan Province, Iran.

Materials and Methods

This cross-sectional analytical study was conducted on 243 family caregivers of frail elderly residing in Garmeh

County, North Khorasan, Iran, during 2025 (April to June). The study population included all family caregivers of frail elderly living at home and visiting health centers in Garmeh County. The sample size was calculated using G*Power software, version 3.1 with the "exact-correlation: Bivariate normal model" option for a bivariate correlation test, employing an a priori analysis for a two-tailed test based on an effect size (Correlation ρ $H_1=0.22$) from Yang et al. [27], $\alpha=0.05$, power=0.90, and ρ $H_0=0$, yielding 213 participants corresponding to this specific model. To account for potential non-response, the sample size was increased by 30 participants, bringing the total to 243. Frail elderly were identified from the integrated health care system (SIB) database of Garmeh County based on assessments of nutritional status, body mass index (BMI), mental health status, ability to perform daily activities, need for assistance in personal affairs, dependency status, and need for care.

Sampling was performed by a two-stage random method: First, clusters were selected using cluster sampling from 6 urban comprehensive health service centers and 4 rural health centers. Then, individuals were selected using random sampling (random number table). After obtaining necessary permissions and identifying frail elderly, caregivers (one per frail elderly) were contacted by phone, given verbal consent, and informed about the study objectives. Then, they were invited to participate in health centers. In the next stage, written informed consent was obtained from eligible participants, who were assured of confidentiality. Data collection tools were completed by the caregivers under the researcher's supervision.

The inclusion criteria included aged 18 years or older, residence in Garmeh County, continuous caregiving for a frail elderly individual for at least the past 6 months, ability to communicate and fluency in Persian, informal caregiver status, no history of psychiatric disorders under treatment (such as schizophrenia, severe depression, cognitive disorders) based on self-report and medical records, and informed consent. The exclusion criterion was incomplete or partially completed questionnaires.

The data collection instruments

Demographic information form included variables such as age, gender, residential status, education level, employment status, income level, physical disease, psychiatric history, history of visits to psychiatrists, and experience of stressful events in the past 6 months.

The general self-efficacy scale (GSE-17) was developed by Sherer et al. in 1982. This scale consists of 17 items [28]. The scoring method is based on a 5-point Likert scale ranging from strongly agree=1 to strongly disagree=5, with a total score range from 17 to 85. Items 1, 3, 8, 9, 13, and 15 are scored directly, while others are reverse-scored. Scores between 17 and 34 indicate low self-efficacy, 34 to 51 moderate self-efficacy, and scores above 51 indicate high self-efficacy [29, 30]. Psychometric properties of the Persian version, including criterion and construct validity, were confirmed by Delavar et al., with a Cronbach α reliability coefficient of 0.79, which is acceptable [31].

The caregiver burden inventory (CBI) assessed caregiver burden using the 24-item version. CBI was developed by Novak and Guest [32]. The inventory consists of 5 subscales: Time-dependent burden (items 1-5), developmental burden (items 6-10), physical burden (items 11-14), social burden (items 15-19), and emotional burden (items 20-24). Responses are rated on a 5-point Likert scale from never (0) to almost always (4). Total scores range from 0 to 96; scores of 36 or higher indicate a high caregiver burden. Internal consistency for the subscales, as measured by Cronbach α in the original inventory, ranged from 0.79 to 0.93 [33]. Shafieza-deh et al. translated and validated the 24-item Persian version, reporting Cronbach α of 0.93 for the total scale and 0.70-0.89 for subscales [34]. In our sample, Cronbach α was 0.94 (total) and 0.89-0.92 (subscales).

The ten-item personality inventory (TIPI) assessed personality traits using Gosling et al.'s 10-item TIPI [35]. The 5 traits measured are extraversion (sociality, sociability), agreeableness (empathy, helpfulness), conscientiousness (orderliness, achievement striving), emotional stability (versus neuroticism), and openness to experience (curiosity, creativity). Each trait is measured with two items. The TIPI is popular due to its cost- and time-efficiency, and can be completed by individuals with minimal literacy. Responses are on a 7-point Likert scale ranging from strongly disagree to agree strongly. Total personality scores range from 10 to 70. Some items are reverse-scored. Gosling et al. [35] reported Cronbach α for subscales between 0.40 and 0.73 in a sample of 1813 participants. In Iran, Azkosh et al. standardized and localized the scale in a sample of 160 elderly individuals (aged 66 to 71), reporting a Cronbach α of 0.51 for the overall scale and 0.40 to 0.60 for the subscales [36].

Data analysis

The collected data in this study were analyzed using SPSS software, version 26. Initially, the data were screened for outliers. Descriptive statistics, including frequency, percentage, Mean±SD, were used to describe the variables. Inferential statistical tests, including independent t-tests, analysis of variance (ANOVA), Pearson correlation coefficient, and multiple linear regression (simultaneous approach with variables selected based on univariate $P < 0.2$), were employed to examine relationships among variables. The normality of data distribution was assessed using skewness and kurtosis tests. A significance level of less than or equal to 0.05 was considered for all statistical tests.

Results

A total of 243 participants were included in this study. The Mean±SD age of the participants (caregivers) was 51.6±11.3 years. Most participants were married (76.1%), and 90.5% were female. Regarding education, 16.5% of the participants were illiterate. Table 1 presents detailed demographic characteristics of the participants.

Independent t-test results showed that having physical diseases, a history of psychological problems, past psychiatric visits, and experiencing stressful events in the last 6 months were significantly associated with increased caregiver burden ($P \leq 0.05$). However, no significant association was found between caregiver burden and the gender of the caregiver or the older person, or residential status ($P > 0.05$) (Table 1).

ANOVA revealed significant differences in mean caregiver burden scores across groups classified by caregivers' education level, employment status, and the age group of the cared-for elderly ($P \leq 0.05$) (Table 1). Post-hoc Tukey tests revealed that caregivers of older people aged 60-74 years experienced significantly lower burden than those caring for those aged ≥ 85 years ($P < 0.01$). University-educated caregivers reported lower burden than those with primary education ($P < 0.01$). Homemakers had a higher burden than employed ($P < 0.01$) and retired caregivers ($P < 0.05$). No significant differences were found for caregiving duration, living arrangement, or relationship to older people ($P > 0.05$) (Table 1).

Normality test results based on skewness and kurtosis indicated that the data were within the acceptable range (-2 to +2), confirming normality. The Mean±SD score of the CBI was 42.32(18.81). Of 247 caregivers, 126(51%) had CBI scores ≥ 36 , confirming substantial prevalence of

high caregiver burden. Among the caregiver burden components, emotional burden had the highest Mean±SD score of 11.17(5.06). Descriptive statistics of the quantitative variables are presented in Table 2.

The correlation analysis results revealed a significant negative association between general self-efficacy and CBI in the present study ($r = -0.56$, $P \leq 0.05$). This finding indicates that as caregivers' self-efficacy levels increase, their caregiver burden decreases. Among the caregiver burden subscales, emotional burden showed the strongest negative correlation with self-efficacy ($r = -0.57$, $P \leq 0.001$), whereas physical burden had the weakest correlation ($r = -0.40$, $P < 0.001$) (Table 3). Additionally, caregiver burden was significantly and negatively correlated with personality traits ($P \leq 0.05$). Among these, extraversion ($r = -0.67$, $P < 0.05$) and openness to experience ($r = -0.70$, $P < 0.05$) had the strongest associations with caregiver burden. This finding suggests that individuals who are more extraverted and open to new experiences experience less caregiver burden. No significant association was found between caregiver age and overall CBI ($P \geq 0.05$); however, positive and significant correlations were observed between age and physical burden ($r = 0.28$, $P \leq 0.05$) as well as time-dependent burden ($r = 0.26$, $P \leq 0.05$) (Table 3).

In this study, a simultaneous multiple regression analysis was used to control for concurrent effects of demographic variables and predictors on caregiver burden (CBI) and to determine the model's explanatory power. After verifying the assumptions of linear regression (normality of the dependent variable, independence of errors, and absence of multicollinearity), the independent variables explained 67% of the variance in caregiver burden ($R^2 = 0.67$, adjusted $R^2 = 0.63$).

The multiple linear regression results, based on standardized regression coefficients (β) and significance levels ($P \leq 0.05$), showed that a history of psychiatric visits (no visits vs visits) was significantly associated with reduced caregiver burden ($\beta = -0.31$, $P = 0.01$). Among personality dimensions, extraversion ($\beta = -0.16$, $P = 0.04$), openness to experience ($\beta = -0.32$, $P = 0.01$), and conscientiousness ($\beta = -0.14$, $P = 0.04$) were strongly associated with lower caregiver burden. Additionally, caregivers' general self-efficacy was significantly linked to reduced caregiver burden ($\beta = -0.10$, $P = 0.04$). Other variables such as marital status, employment, and education level were not significantly associated with caregiver burden in the regression model ($P > 0.05$) (Table 4).

Table 1. Descriptive statistics and comparing the CBI mean score by demographic variables

Variables	Category	No. (%)	Mean±SD	F/t	P
Caregiver gender	Male	23(9.5)	36.43±20.72	1.58 ^b	0.11
	Female	220(90.5)	42.93±18.54		
Residential status	Owner	193(79.4)	42.93±18.91	0.99 ^b	0.32
	Tenant	50(20.6)	39.96±18.42		
Educational level	Illiterate	40(16.5)	41.37±19.47	4.02 ^a	0.004 [*]
	Primary	62(25.5)	46.22±19.69		
	Middle school	63(25.9)	46.90±17.99		
	Secondary school	60(24.7)	35.81±16.05		
Employment status	University	18(7.4)	36.61±19.56	5.45 ^a	0.005 [*]
	Housewife	152(62.6)	45.05±18.63		
	Employed	80(32.9)	38.76±18.28		
Marital status caregiver	Retired	11(4.5)	30.36±17.56	2.28 ^a	0.10
	Married	185(76.1)	42.02±18.44		
	Single	23(9.5)	36.91±19.31)		
Living arrangement	Widow/Divorced	35(14.4)	47.42±19.76	2.52 ^a	0.08
	Alone	37(15.2)	38.70±20.37		
	With spouse	181(74.5)	42.07±18.51		
Income	With children	25(10.3)	49.44±17.37	0.46 ^a	0.63
	Less than expenses	74(30.5)	44.04±20.35		
	Equal to expenses	152(62.6)	41.65±17.91		
Experience of stressful events	More than expenses	17(7)	40.76±20.31	5.20 ^b	0.001 [*]
	Yes	40(16.5)	55.77±18.31		
Physical diseases	No	203(83.5)	39.67±17.79	4.61 ^b	0.001 [*]
	Yes	144(59.3)	46.75±19.52		
History of psychiatric visit	No	99(40.7)	35.86±15.71	9.70 ^b	0.001 [*]
	Yes	69(28.4)	58.13±15.41)		
History of psychological problems	No	174(71.6)	36.05±16.2	8.58 ^b	0.001 [*]
	Yes	73(30)	56.52±16.41		
Elderly gender	No	170(70)	36.22±16.36	-0.49 ^b	0.63
	Male	100(41.2)	41.61±19.84		
	Female	143(58.8)	42.81±18.11		

Variables	Category	No. (%)	Mean±SD	F/t	P
Elderly age (y)	60-74	51(21)	37.23±18.52	7.24 ^a	0.001*
	75-90	149(61.3)	41.37±17.96		
	90<	43(17.7)	51.27±19.42		
Relationship to the elderly	Child	110(45.4)	41.37±18.04	1.23 ^a	0.29
	Spouse	55(22.7)	39.74±20.65		
	Brother/Sister	15(6.2)	43.6±17.07		
	Daughter/Son-in-law	63(25.7)	45.92±18.72		
Duration of care (y)	6 months to 3	74(30.5)	40.07±15.13	2.42 ^a	0.06
	3 to 7	71(29.3)	41.32±19.21		
	7 to 10	48(19.8)	48.75±22.22		
	10<	50(20.6)	39.96±18.83		

*P≤0.05, ^aANOVA(F), ^bt-test (t).

Discussion

The present study aimed to determine the association between general self-efficacy and personality traits with caregiver burden among family caregivers of frail elderly in Garmeh County, Iran. More than half of the participants reported high caregiver burden, consistent with

prior studies that documented elevated burden prevalence among informal caregivers of older adults, particularly those with frailty, chronic diseases, or disability [37, 38]. This finding underscores the challenges faced by caregivers of frail elderly, who often require prolonged and intensive support, thereby imposing considerable psychological, physical, and social strain on caregivers.

Table 2. Descriptive statistics for quantitative variables in the study

Variables	Mean±SD	Range	Skewness	Kurtosis	
CBI	42.32±18.81	12-82	0.41	-1.08	
Time-dependence burden	9.83±4.07	0-20	0.26	-0.32	
Developmental burden	8.32±4.44	0-20	0.55	-0.15	
Physical burden	6.2±3.71	0-16	0.40	-0.54	
Social burden	6.76±4.81	0-19	0.51	-0.69	
Emotional burden	11.17±5.06	0-20	0.03	-0.9	
General self-efficacy	51.53±5.76	36-63	-0.22	-0.54	
Personality traits (TIPI)	Extraversion	7.55±2.93	2-14	-0.08	-1.02
	Agreeableness	9.79±2.09	6-14	0.20	-1.1
	Conscientiousness	9.64±2.45	3-14	-0.22	-0.24
	Emotional stability	8.01±1.97	3-13	0.44	0.19
	Openness to experience	7.58±3.1	2-14	0.007	-1.1
	Age of caregiver	51.65±11.3	22-77	-0.32	0.05

Table 3. Correlation of research variables with caregiver burden and its dimensions

Variables	CBI	Time-dependence Burden	Developmental Burden	Physical Burden	Social Burden	Emotional Burden	
General self-efficacy	-0.56**	-0.41**	-0.45**	-0.4**	-0.52**	-0.57**	
Extraversion	-0.67**	-0.47**	-0.57**	-0.57**	-0.61**	-0.62**	
Agreeableness	-0.54**	-0.41**	-0.43**	-0.5**	-0.48**	-0.46**	
Personality traits (TIPI)	Conscientiousness	-0.52**	-0.32**	-0.41**	-0.41**	-0.56**	-0.48**
	Emotional stability	-0.23*	-0.06	-0.19	-0.1	-0.25**	-0.29**
	Openness to experience	-0.7**	-0.45**	-0.63**	-0.61**	-0.63**	-0.66**
Age (caregiver)	-0.04	0.26**	-0.07	0.28**	-0.05	-0.12	

* $P \leq 0.05$, ** $P \leq 0.001$.

The findings of this study revealed that higher general self-efficacy was significantly associated with lower caregiver burden. Similarly, certain personality traits, namely extraversion, conscientiousness, and openness to experience, exhibited significant inverse associations with caregiver burden and emerged as significant predictors in the multiple regression analysis. The negative association between caregivers' self-efficacy and caregiver burden (including its dimensions) suggests that higher self-efficacy is likely accompanied by lower burden. This finding is consistent with several prior studies, which emphasize that enhancing caregivers' perceived competence and confidence can reduce caregiving-related stress, ultimately improving their QoL and functioning [39-41].

Among the personality traits, the dimensions of extraversion, conscientiousness, and openness to experience showed significant negative associations with caregiver burden among family caregivers, a finding consistent with several previous studies [17, 42, 43]. In the present study, extraverted individuals reported lower caregiver burden compared to introverts. The reason may be related to individuals with high extraversion who tend to seek greater social support when facing stress and exhibit more active social behaviors. Additionally, caregivers who score higher on extraversion appear better equipped to manage relational tensions and provide more adaptive responses in stressful situations [17, 44]. Conscientiousness, characterized by traits such as orderliness, responsibility, self-discipline, and diligence (in contrast to disorganization and irresponsibility), suggests that more conscientious and persevering caregivers are likely better able to cope with caregiving stress through structured planning and problem-focused coping strategies. Similarly, caregivers high in openness to experience, characterized by receptiveness to new experiences, curiosity, creativity, and cognitive flexibility, may adopt novel approaches when confronted with new and

challenging caregiving situations, thereby achieving better adaptation to caregiving pressures [45]. From a conceptual perspective, self-efficacy and certain personality traits (extraversion, conscientiousness, and openness to experience) may modulate caregiver burden by promoting problem-focused coping, enhancing perceived control, and facilitating the use of social support. However, the cross-sectional design of this study precludes causal inferences regarding these mechanisms.

Univariate analyses revealed significant associations between caregiver burden and occupation, education level, physical illness, and the elderly recipient's age. However, these associations did not remain significant in the multivariable analysis, aligning with previous studies that reported no significant relationship between caregiver burden and age [46], occupation [39, 47, 48], or physical illness [46, 49]. In contrast, a history of psychiatric visits emerged as a variable that maintained a significant positive association with caregiver burden in the multivariable model. This finding is consistent with the results of studies by Yang et al. [27] and Talebi et al. [50]. Research has shown that the lives of family caregivers are often marked by changes such as time constraints, reduced emotional satisfaction, disruptions in social and family life, self-neglect, and chronic ongoing stress, which can lead to mental health problems. For instance, anxiety and depression negatively affect caregivers' emotions, thoughts, perceptions, behaviors, and functioning, impairing their ability to optimally perform caregiving tasks and adapt to the situation, thereby increasing caregiver burden [47, 51]. Overall, the findings of this study highlight the prominent and independent role of personal resources, namely self-efficacy and adaptive personality traits, as protective factors, underscoring the need for targeted interventions that emphasize individual differences in this context.

Table 4. Factors affecting the CBI score according to linear regression

Variables (Reference)		CBI					95% CI	
		B	β	SE	P	Lower Bound	Upper Bound	
Caregiver gender (female)		0.32	0.005	2.99	0.91	-5.89	6.23	
Marital status (single)	Married	-1.63	-0.03	5.61	0.77	-12.71	9.43	
	Widowed/Divorced	2.68	0.05	4.3	0.53	-5.79	11.17	
Employment status (housewife)	Employed	-1.36	-0.03	3.93	0.39	-5.89	9.81	
	Retired	-3.32	-0.03	2.05	0.50	-8.59	30.14	
Education level (illiterate)	Primary	-0.52	-0.01	2.57	0.81	-5.66	4.47	
	Middle school	1.34	0.03	2.89	0.64	-4.36	7.04	
	Secondary school	-1.58	-0.03	3.73	0.61	-7.76	4.58	
	University	3.67	-0.05	4.19	0.38	-4.58	11.93	
Duration of care (<3 y)	3 to 7	2.43	0.05	2	0.22	-1.51	6.38	
	7 to 10	4.64	0.09	2.45	0.051	-0.18	9.47	
	10+	2.29	0.04	2.56	0.37	-2.76	7.34	
Stressful events experience (yes)		-2.72	-0.05	2.27	0.22	-7.27	1.68	
Living arrangement (alone)	With spouse	3.12	0.07	4.83	0.51	-6.4	12.45	
	With children	3.41	0.05	3.9	0.38	-4.27	11.1	
	Others	16.23	0.05	12.26	0.18	-7.93	40.47	
	Physical diseases (yes)	0.34	0.009	2.02	0.86	-3.63	4.23	
	Psychiatric visit (yes)	-13.12	-0.31	5.19	0.01*	-23.37	-2.88	
	History of psychological problems (yes)	7.9	0.19	5.04	0.11	-2.04	17.85	
	Elderly age	2.21	0.07	1.41	0.11	-0.55	4.99	
	General self-efficacy	0.35	-0.1	0.17	0.046*	0.006	0.69	
	Extraversion	-1.04	-0.16	0.52	0.048*	-2.08	-0.1	
	Agreeableness	0.6	-0.06	0.55	0.303	-0.55	1.76	
	Conscientiousness	-1.09	-0.14	0.37	0.004*	-1.83	-0.34	
	Emotional stability	-0.83	-0.08	0.44	0.063	-1.71	0.04	
	Openness	-1.96	-0.32	0.38	0.001*	-2.73	-1.19	

*P<0.05.

Note: β : Standardized coefficient; B: Unstandardized coefficient; SE: Standard error.

Conclusion

These results cautiously suggest that interventions that enhance caregivers' self-efficacy, while accounting for individual personality differences, may help alleviate caregiver burden. Accordingly, routine screening for caregiver burden and self-efficacy is recommended at comprehensive health service centers, alongside the implementation of brief educational programs to build coping skills and self-efficacy, and the establishment of clear referral pathways to psychological services for caregivers who exhibit psychiatric symptoms. Furthermore, supportive programs should be tailored to caregivers' personality profiles, emphasizing self-efficacy enhancement alongside access to psychological counseling and community resources.

Study limitations

The present study has several limitations that should be acknowledged. Its cross-sectional design precludes causal inferences and restricts the examination of temporal changes. All data were gathered through self-report questionnaires at a single time point, potentially introducing social desirability bias. The TIPI scale for personality assessment may be limited by its relatively low internal consistency in older adult populations. Cluster sampling was employed without adjustment for clustering, which may have affected the analyses' standard errors. Finally, findings were derived from Garmeh County, a region with a unique rural-urban mix in North Khorasan, Iran, limiting generalizability to other cultural, social, or geographic contexts. Future studies should adopt longitudinal designs to establish temporal relationships. Research in more diverse populations would also elucidate the influence of cultural and social factors on caregiver burden.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Research Ethics Committee of [Mazandaran University of Medical Sciences](#), Sari, Iran (Code: IR.MAZUMS.REC.1403.480). Informed consent was obtained from all participants, and their anonymity was ensured throughout the study. Participants completed a written informed consent form and were informed that they could withdraw from the study at any time without consequences.

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Authors contributions

Conceptualization, study design, investigation, and data analysis: Ehteram Sadat Ilali and Abdolhakim Jorbonyan; Investigation: Ehteram Sadat Ilali, Abdolhakim Jorbonyan, Sara Naseripoor and Abdolhakim Jorbonyan; Data collection, and original draft preparation: Sara Naseripoor and Abdolhakim Jorbonyan; Statistical analysis: Mahmood Moosazadeh; Review and editing: Ehteram Sadat Ilali, Abdolhakim Jorbonyan, and Mahmood Moosazadeh; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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