

# Caregiver burden and family functioning – the moderating effect of educational level

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## Introduction:

Demographic aging in Portugal continued to increase significantly, with the population aging index, an indicator that compares the population 65 or more years old over the population aged 0 to 14, being equal to 182 - this index was 128 in 2011 and 102 in 2001 (1). This fact not only puts pressure on the functioning of health and social support services but also on the definition of strategies that promote the quality of life of all those who deal daily with the consequences of an aging population, particularly in the informal caregiver's force (2). Informal caregivers are usually family, friends, or neighbors who provide assistance without financial remuneration (3), constituting the biggest pillar of long-term care in the European Union, despite the tenuous initiatives of public policies (4). Studying the factors that influence caregiver burden may lead to better intervention practices including from family nursing. The aim of this research was to study caregiver burden and family functioning, and explore possible moderation effects of personal factors.

## Methods:

A cross-sectional study was conducted in the Aveiro region, Portugal. Recruitment occurred through primary care centers which invited potential participants. After the explanation of the aims and procedures of the study, the participants were informed about ethical and data protection aspects. Inclusion criteria were: (i) be an informal caregiver of an adult person, (ii) having 18 or more years old, and (iii) be fluent in Portuguese. Exclusion criteria was: (i) person cared for has undergone surgery for less than six months.

The caregiver burden was assessed through a self-reported instrument – Questionário de Avaliação da Sobrecarga do Cuidador Informal - QASCI (5), which consists of 32 items where higher values reflect a greater burden on the caregiver (range 32-160). Personal factors (sex, age, educational level, number of years as caregiver) were obtained directly from participants and the functional independence level (Barthel Index) of the person cared for was retrieved from digital clinical records. Family functioning was self-reported through the Family APGAR scale (6).

Data analysis was conducted via JASP, version 0.14.0 (7). Statistical significance was defined for  $\alpha=0.5$ . Association analysis included Pearson correlation for continuous variables and independent t-test for assessing differences between means. Moderation effects were tested using linear regression by enter method, presenting under this work only those that were statistical significative.

## Results:

Two hundred and twenty-four participants (female:  $n=195$ , 87.1%) with a mean age of  $61y10m\pm12y3m$  were included in the study - Table 1. The caregiver burden mean was  $101.2\pm15.3$ . The mean for Barthel Index (functional independence) was  $73.9\pm27.1$ .

Associations with caregiver burden were found for educational level ( $r=-0.193$ ,  $p<0.01$ ), number of years as a caregiver ( $r=0.203$ ,  $p<0.001$ ), functional independence level ( $r=0.195$ ,  $p<0.01$ ), and family functioning ( $r=-0.234$ ,  $p<0.001$ ), but not for other personal factors like age or sex.

In the first linear regression model using enter method included all the four variables that correlated with caregiver burden were statistical significative [ANOVA  $F(4,219)=8.64$ ,  $p<0.001$ ] explaining 13.6% of the variance. Considering the interaction between family functioning and educational level on caregiver burden (Figure 1) the linear regression model by enter method showed a small improvement [ANOVA  $F(5,218)=7.90$ ,  $p<0.001$ ;  $r^2=15.3\%$ ] for the explained variance (Table 2).

### Keywords:

Caregiver burden, Personal factors, Family Health, Nursing

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### Conflict of interest:

The authors declare no conflict of interests

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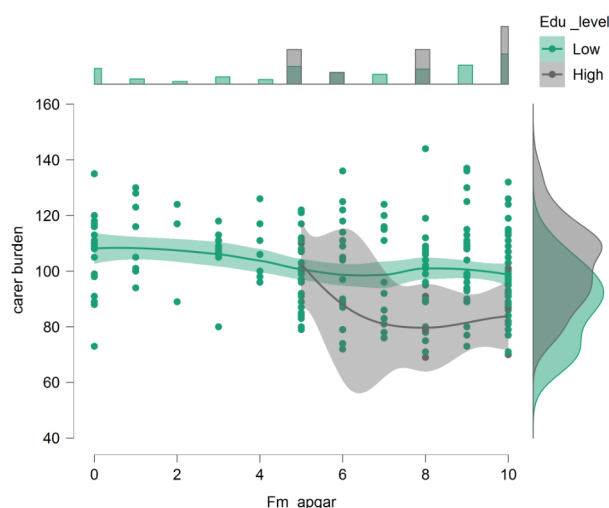


**Table 1** – Participants' characteristics

Variables	
Sex, n(%)	
Female	195 (87.1)
Male	29 (12.9)
Age, mean±sd	61y10m±12y3m
Education level, n(%)	
No formal education	16 (7.1)
Elementary school - 1 <sup>st</sup> cycle, 4 years	108 (48.2)
Elementary school - 2 <sup>nd</sup> or 3 <sup>rd</sup> cycle, 6-9 years	58 (25.9)
Secondary, 12 years	30 (13.4)
University education	12 (5.4)
Years as caregiver, mean±sd	7y1m±6y7m

**Table 2** – Regression models for caregiver burden

Model 1	$\beta$	SE	p-value
(Intercept)	101.491	3.890	<0.001
Family_apgar	-0.918	0.293	0.002
Years as Caregiver	0.327	0.148	0.028
Barthel Index	0.094	0.036	0.009
Educational level	-2.301	0.990	0.021
Model 2	$\beta$	SE	p-value
(Intercept)	95.543	4.796	<0.001
Family_apgar	0.067	0.554	0.904
Years as Caregiver	0.306	0.147	0.039
Barthel Index	0.088	0.036	0.014
Educational Level	2.236	2.383	0.349
Fm_apgar * Edu_lev	-0.669	0.320	0.038

**Figure 1** - Scatter plot for the moderator effect of education level between caregiver burden and family functioning

### Discussion:

The evidence demonstrated that some factors influencing caregiver burden could lead to an individualized intervention. A previous study (8) showed the relevance of educational level in caregiver burden perception. These results are as those presented in this work, with a higher educational level revealing lower caregiver burden values. The same is possible be observed for the association between the functional independence level or for the number of years as a caregiver and the caregiver burden, which is transversal to different health conditions (9–12). Family functioning also plays an important role in

caregiver burden experience but has a close relationship with educational level. This relationship is quite evident in this study, and their interaction seems to contribute with more relevance to the caregiver burden perception than just their individual influence. Future studies may confirm these results in other population samples, and explore the relationship with other constructs, namely those related to the quality of life and social participation.

#### Ethics committee and informed consent:

The ethics committee of the Health Regional Administration of Center approved this study. All participants signed an informed consent form.

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