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Elder abuse among Spanish and Iranian people: new methodological approach to the same old story

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Abstract

Elder abuse continues to be a taboo, mostly underestimated, ignored by societies across the world. Recent systematic reviews and meta-analyses have revealed significant variations in the prevalence of elder abuse, with large geographic variations. This is the first study that compares the prevalence of elder abuse and risk factors between a European and Asian countries and using the same method. Cross-sectional surveys were conducted in Spain and Iran. Eight hundred forty subjects, aged 65 and over, were chosen randomly from patients in primary care health centres. Prevalence of abuse and subtypes and risk factors were obtained using structured interviews. To minimize the potential effects of selection bias, a propensity score matching was performed. Multiple correspondence analysis was used to evaluate the possible relationships among all the variables and to identify specific profiles. Five hundred thirty-two older people remained for the analysis after matching. The prevalence of abuse was 39.1% in Spain and 80.5% in Iran. Elder abuse and its subtypes are significantly more probable in Iran than in Spain. Out of every five elderly people questioned, two in Spain and four in Iran responded affirmatively to a question concerning elder abuse. Multiple correspondence analysis allows the differences between patterns of elder abuse between both populations to be visualized. Elder abuse is a prevalent problem in Spain and Iran. While some characteristics are shared in the pattern of abuse there are different profiles between the two countries. Detecting elder abuse should be a priority objective in clinical and forensic setting.

Key points
• This is the first study that compares the prevalence of elder abuse between a European and Asian country, using the same methodology.
• Multiple correspondence analysis allows specific elder abuse profiles to be identified.
• Elder abuse is significantly more likely to occur in Iran than in Spain.
• Out of every five elderly people questioned, two in Spain and four in Iran responded affirmatively to a question concerning elder abuse

Keywords Elder abuse · Clinical · Forensic · Propensity score · Multiple correspondence analysis

Introduction

A tolerant social climate towards violence is one of the macrosocial factors that favour the emergence of family violence. Erroneously, we have tended to associate authority with violence, which has helped legitimize violence. Within family violence, elder abuse is the subject of research and strategies have been designed to deal with the problem from

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the health, legal and social sciences viewpoint. Several authors have related elder abuse with an increase in mortality, morbidity physical and mental, a detriment in the quality of life and an increase in the consumption of personal, health and social resources [1, 2]. All this suggests that elder abuse should be considered a health problem of first magnitude that demands urgent attention [3].

The gradual aging of the population in most countries of the developed world along with social changes, such as low birth rate and the incorporation of women (traditionally responsible for the care of the elderly) into the labour market, and various cultural changes, such as increases in intolerance and discrimination of the elderly, together with the tendency to confine them to institutions establish elder abuse as a public social-health challenge in developed societies [4–6]. However, in many parts of the world, elder abuse occurs with little recognition or response and little is known about the prevalence of elder abuse in developing countries [7].

Even today, elder abuse continues to be a taboo, mostly underestimated and ignored by societies across the world. For this reason, recent years have seen an increase in the number of authors recommending that doctors systematically question old people concerning the possible mistreatment by asking them directly. Recent systematic reviews and meta-analyses have revealed significant variations in the prevalence of elder abuse, with large geographic variations that might stem from cultural, social, or methodological differences [8, 9].

In our knowledge, this is the first study that compares the prevalence of elder abuse and risk factors between a European and Asian countries and using the same method. The application of new methodological tools, such as a propensity score–matched analysis and multiple correspondence analysis, has allowed us to eliminate biases and identify specific profiles of elder abuse in both types of country.

Material and methods

Study design and participants

A cross-sectional descriptive analytical study was conducted in Murcia (Spain) and Kermanshah (Iran), approved by the Research Ethics Committee of Murcia University (Spain) (approval ID: 2048/2018) and by Research Ethics Committee Kermanshah University of Medical Sciences (approval ID: IR.KUMS.REC.1399.606).

Figure 1 shows the scheme and sequence of the phases of the study. The size of the sample initially calculated was for an estimated extent of elder abuse in the world of 15% [9], with a precision of 3.5% and with a confidence interval of 95%. The sample size calculated was 400, to which we added 5% to cover the possible withdrawals. The final sample contained 840 subjects (420 in each country).

Sampling was carried out using a multistage random sampling method. First, between the health centres included in health district I in Murcia (32 health centres) and in Kermanshah (34 health centres), two health centres were randomly selected in each city (two centres in Murcia and two centres in Kermanshah). Finally, based on the list of subjects aged 65 and over treated at each selected health centre, 210 elderly people were systematically selected. The exclusion criteria included being seriously ill, presence of hearing disability, mental incapacity or inability to provide answers. One hundred fourteen subjects were excluded (62 and 52 in Spain and Iran, respectively): 47 for inconsistent impairment cognition or barriers to answering questions, 20 for severe disease, 15 refused to participate, 16 could not be contacted and 16 had died.

The interviews were carried out in private and confidentiality was guaranteed; each patient was also subjected to. It was deemed important that the person conducting the interviews should have the full confidence of the subjects, thus increasing the chance of sincere replies. When applicable, the subjects were asked if the situations discussed had occurred after they had attained the age of 65. Each subject was asked to sign an informed consent form before taking part in the study.

Data collection and study variables

The data were obtained by means of a face-to-face administered questionnaire. The interview protocol included 5 sections: (1) cognitive status assessment; (2) socio demographic characteristics; (3) risk factors of elder abuse; (4) elder abuse assessment and (5) physical examination.

We use the same questionnaires in both countries, Farsi versions in Iran and Spanish versions in Spain. Cognitive deficits not mentioned in the medical history were evaluated using the Short Portable Mental Status Questionnaire (SPMSQ) [10]; the Spanish version was validated by Martinez de la Iglesia et al. [11] and used previously in Farsi by others authors [12]. Patients scoring 5 and above on this scale (advanced cognitive deterioration) were excluded.

Sociodemographic characteristics of the participants (sex, age, marital status, living with, and accommodation) were collected. Other variables analyzed are those described as risk factors in elder abuse by several authors [6, 8, 13, 14]. These factors were (a) having a chronic illness, (b) having a recent worsening of health, (c) sharing a house with a person with a chronic illness, (d) sharing a house with a person with a mental illness, (e) sharing a house with someone who consumes an excessive amount of alcohol, (f) sharing a house with someone who consumes illegal drugs and (g) depending on others for some basic daily activity. The Katz Index was used to evaluate the degree of dependence, since it can be used with the old people without the help of the carer and because of its reliability in primary care.

Fig. 1 Flowchart with the different phases of the study
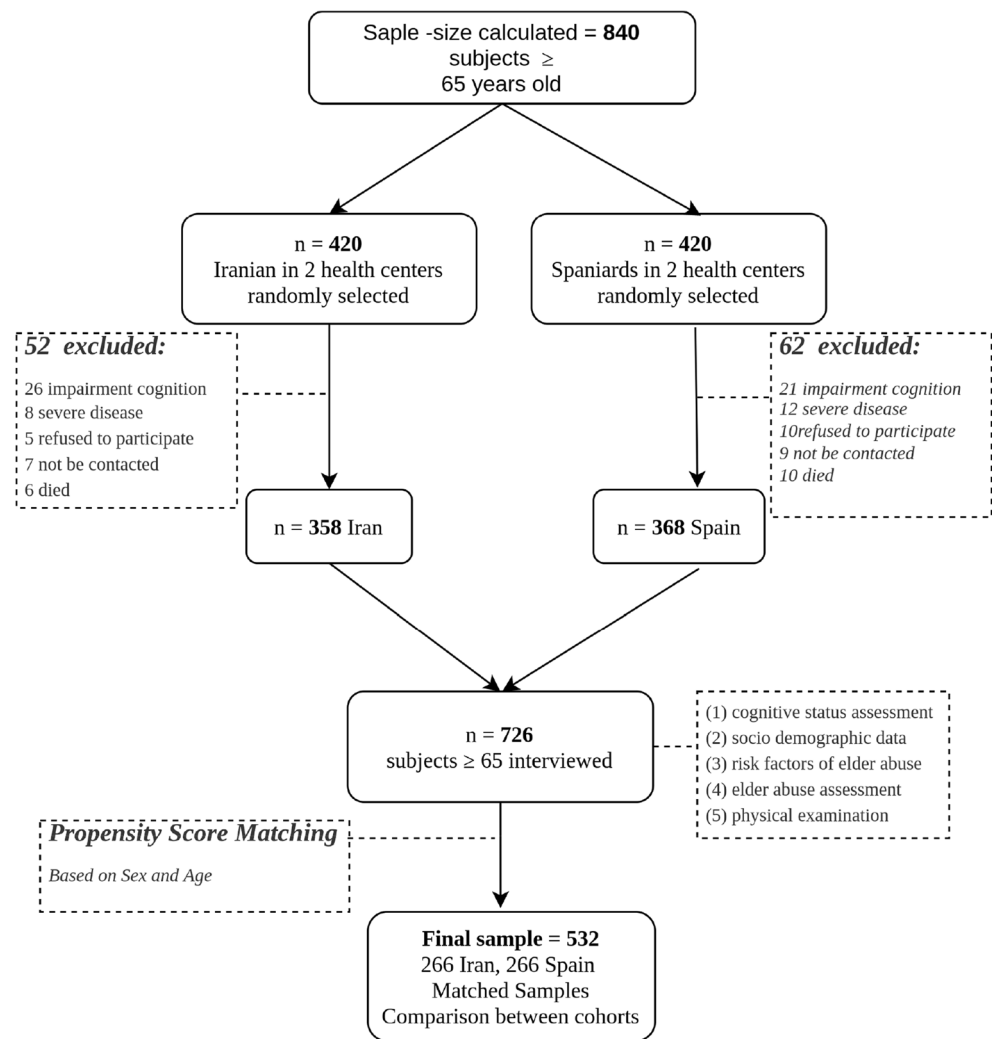
After a literature review, the signs of abuse that were looked for in the physical examination of the subjects were (a) skin lesions (basically bruises, bites, scratches), (b) dehydration and/or malnutrition, (c) pressure ulcers and (d) poor body and/or mouth hygiene [15–17]. To examine older people we follow the general principles established by the European Council of Legal Medicine (ECLM) [18].

To detect abuse and subtypes of abuse, the questionnaire dealing with suspected cases of maltreatment edited by the American Medical Association (AMA) and the Canadian Task Force (CTF) and recommended by European Council of Legal Medicine (ECLM) was used [18, 19]. The questionnaire consists of nine questions, of which one refers to physical negligence, three to psychological abuse, one to physical abuse, two to financial abuse, one to sexual abuse and one to the withholding of care (Table 1). The questionnaire was translated into Spanish and Farsi. The Kuder-Richardson (KR-20) index of internal consistency was 0.88 and 0.85, respectively. Elder abuse was taken to have occurred when at least one of the questions concerning any of the subtypes of abuse was affirmative.

Table 1 Questions in a semi-structured interview to detect abuse suggested by American Medical Association and Canadian Task Force for routine encounters with older people

Neglect
　Has anyone ever failed to help you take care of yourself when you needed help?
Psychological abuse
　Are you afraid of anyone at home?
　Has anyone ever scolded or threatened you?
　Has anyone ever made you do things you did not want to do?
Physical abuse
　Has anyone at home ever hurt you?
Financial abuse
　Have you ever signed any documents that you did not understand?
　Has anyone taken anything that was yours without asking?
Sexual abuse
　Has anyone ever touched you without your consent?
Withholding of care
　Are you alone a lot?

Statistical analysis

First, to minimize the potential effects of selection bias and to decrease the variability of both groups, a propensity score matching was performed [20]. The propensity score is the conditional probability of assignment to a particular treatment given a vector of observed covariates. The matching method was based on one-to-one nearest neighbour with a tolerance level on the maximum propensity score distance (calipers of width 0.1 SD of the logit of the propensity score). This propensity score based matching procedure was applied in a total of 726 elderly people who were well matched for age and sex (358 Spanish and 368 Iranian).

Multiple correspondence analysis (MCA) was used to evaluate the possible relationships among all the variables and to identify specific profiles. Associations between features are represented graphically in MCA, providing a graphic representation of the statistical relationships among distinct features, with the position of each exclusively informative. This representation aims to visualize the similarities and/or differences in the profiles simultaneously, identifying those dimensions that contain most of the data variability. The position of the points in the MCA graph is also informative. Ultimately, MCA was used to examine sample variance as a measure of similarity or dissimilarity between elder abuse among Spanish and Iranian older people.

R software, version 3.3.1, was used to compute the propensity coefficient and multiple correspondence analysis (MCA) [21, 22].

Data analysis was completed using SPSS version 24.0. Descriptive and bivariate statistics were used to compare Spanish and Iranian cases on abuse and subtypes, risk factors of elder abuse, signs in physical examination and sociodemographic characteristics. Univariate logistic regressions were used to study the relationship between country and elder abuse and their subtypes. Binary logistic regression was performed to find association between various factors and elder abuse.

Results

The propensity score analysis was based on demographic characteristics, age and sex, which significantly differ between the Spanish and Iranian groups when analysing the entire patient cohort of 726 subjects. A total number of 532 older people (266 in each group) remained for the analysis after matching. Figure 2 shows that after matching all lie in the range of the point selected balance (− 0.15, + 0.15).

Table 2 depicts the sociodemographic characteristics of the elderly interviewed in final sample. The mean age of the sample was 72.8 years (SD 4.9, range 65–87), with the group of 75–79 years predominating in both countries. Of the sample, 63.3% was male. The percentage of married people was significantly higher among Spaniards (67% vs. 54%); however, widowers predominated among the Iranians (37% vs. 24%). Cohabitation also shows significant differences between both countries, subjects in Spain living predominantly with spouse and children (37%), while in Iran 38% live exclusively with the spouse. Ninety-one percent of older Spaniards live in their own home compared with 70% of elderly Iranians, 21% of whom live in relatives' homes and 8.3% rotate between

Fig. 2 Absolute standardized mean differences in each of the covariates used in the matching (gender and the four age levels) for before and after matching
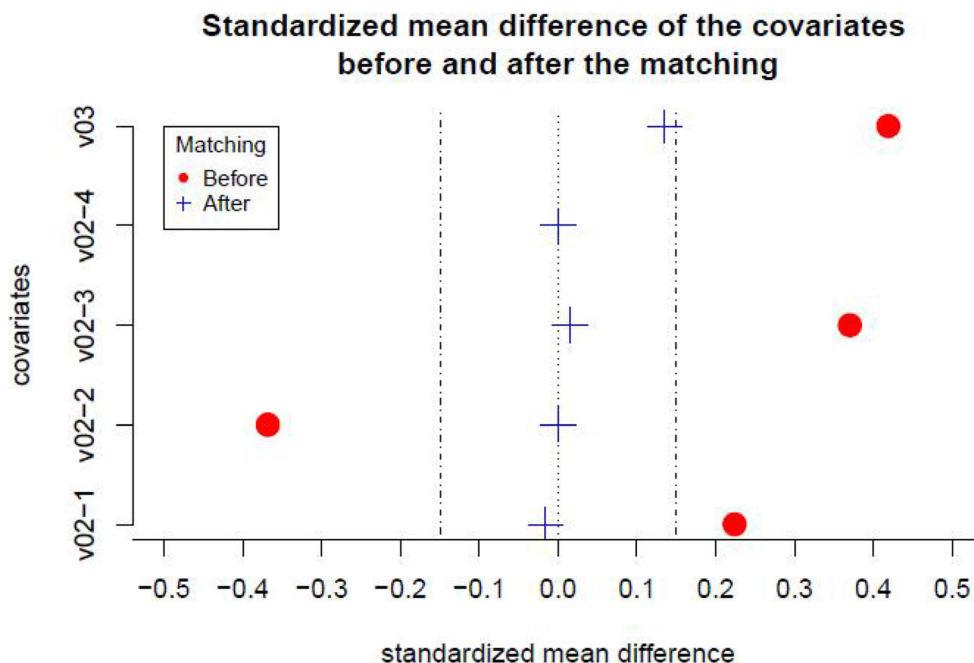
Table 2 Distribution of socio-demographic characteristics (n = 532)

Socio-demographic characteristics	Spain (n = 266) % (95% CI)	Iran (n = 266) % (95% CI)	p value
Sex			
Women	39.8 (33.9–46.0)	33.5 (27.8–39.5)	0.71
Men	60.2 (54.0–66.1)	66.5 (60.5–72.2)	
Age (group years)			
65–69	35.3 (29.6–41.4)	34.6 (28.9–40.6)	0.99
70–74	17.7 (13.3–22.8)	17.7 (13.3–22.8)	
75–79	42.9 (36.8–49.0)	43.6 (37.6–49.8)	
≥ 80	4.1 (2.1–7.3)	4.1 (2.1–7.3)	
Marital status			
Married	67.3 (61.3–72.9)	54.1 (47.9–60.2)	0.01
Single	4.5 (2.4–7.7)	5.6 (3.2–9.1)	
Divorced	3.8 (1.8–6.8)	3.0 (1.3–5.8)	
Widowed	24.4 (19.4–30.1)	37.2 (31.4–43.3)	
Living with			
Alone	18.8 (14.3–24.0)	10.2 (6.8–14.4)	< 0.0001
Spouse	30.8 (25.3–36.8)	38.7 (32.8–44.9)	
Children	13.2 (9.3–17.8)	27.8 (22.5–33.6)	
Spouse + children	37.2 (31.4–43.3)	17.3 (12.9–22.4)	
Other relatives	0	6.0 (3.5–9.6)	
Accommodation			
Home	91.4 (87.3–94.4)	70.3 (64.4–75.7)	< 0.0001
House of relatives	6.8 (4.1–10.5)	21.4 (16.7–26.9)	
Rotational	1.9 (0.6–4.3)	8.3 (5.3–12.3)	

different relatives' homes, a practice that represents only 1.9% of Spaniards.

Five risk factors for elder abuse were significantly more prevalent among older Iranians: a recent worsening of illness, and living with a chronically ill person, a mentally ill person, an alcohol abuser, or with a person who uses illegal drugs (Table 3).

In the physical examination, signs of dehydration/ malnutrition and poor body and/or oral hygiene were detected, with a significantly higher prevalence in elderly Iranians. Skin lesions characteristic of physical abuse were not detected in either group (Table 3).

Prevalences of abuse and their subtypes in each country are shown in Table 3. Among the Spanish participants, 2 in 5 answered affirmatively to at least one question about elder abuse (39.1%), while the corresponding figure in Iran was 4 in 5 (80.5%).

Logistic regression analysis revealed that, over the age of 65, elder abuse and its subtypes Physical Negligence, Psychological Abuse, Physical Abuse and Financial Abuse are significantly more probable in Iran than in Spain. The odds ratios (95% confidence intervals, Probability) were

respectively: elder abuse 6.06 (4.24–8.65; $p < 0.001$), physical negligence 3.99 (2.80–5.69; $p < 0.001$), psychological abuse 6.61 (4.64–9.42; $p < 0.001$), physical abuse 15.43 (8.01–29.75; $p < 0.001$), and financial abuse 1.93 (1.32–2.83; $p < 0.01$). However, there was no greater risk of withholding care in the Iranian group of older people than in Spain. No case of sexual abuse was mentioned by Spanish participants, whereas six Iranians mentioned having been subjected to this subtype of abuse.

Independent factors associated with any abuse after performing multivariate analysis are shown by each country in Table 4. Among Spanish participants, abuse was higher in women (OR = 2.17, 95%, CI 1.36–3.48), be between 75 and 79 years (OR = 2.82, 95%, CI 1.62–4.91) or be 80 years of age or older (OR = 2.43, 95%, CI 1.35–4.39), live on a rotational way (lives every time in a child's house) (OR = 3.85, 95%, CI 1.45–10.23) or in house of relatives (OR = 1.94, 95%, CI 1.21–3.82), be dependent for basic activities of daily living (OR = 2.38, 95%, CI 1.33–4.27) and having signs of poor body and/oral hygiene (OR = 4.01, 95%, CI 1.75–9.18). Among Iranians, abuse was higher in those 75–79 years old (OR = 9.58, 95%, CI 3.05–29.71), living with children (OR =

Table 3 Risk factors and warning signs of elder abuse in physical examination, and the prevalence of suspicion of abuse and its different types associated with country (n = 532)

	Spain (n = 266) % (95% CI)	Iran (n = 266) % (95% CI)	
Risk factors			p value
Having a chronic illness	75.9 (70.3–81)	74.8 (69.1–79.9)	0.420
Recent worsening of illness	7.1 (4.4–10.9)	53.8 (47.6–59.9)	< 0.0001
Living with a chronically ill person	21.8 (17–27.3)	50 (43.8–56.2)	< 0.0001
Living with a mentally ill person	1.9 (0.6–4.3)	15.8 (11.6–20.7)	< 0.0001
Living with an alcohol abuser	5.6 (3.2–9.1)	11.7 (8.1–16.1)	0.01
Living with a person who uses illegal drugs	1.9 (0.6–4.3)	47 (40.9–53.2)	< 0.0001
Arguing frequently with family members	25.6 (20.4–31.2)	29.7 (24.3–35.6)	0.166
Functional disability for daily activities	26.3 (21.1–32)	23.3 (18.4–28.9)	0.241
Physical examination			
Skin lesions suggesting abuse	0	0	——
Objective signs of dehydration/malnutrition	1.9 (0.6–4.3)	7.9 (5–11.8)	0.001
Pressure ulcers	1.9 (0.6–4.3)	0.4 (0.0–2.1)	0.108
Signs of poor body and/or oral hygiene	11.7 (8.1–16.1)	45.1 (39–51.3)	< 0.0001
Type of abuse			
Neglect	15.4 (11.3–20.3)	41.4 (35.4–47.5)	< 0.0001
Psychological abuse	11.3 (7.7–15.7)	53 (46.8–59.1)	< 0.0001
Physical abuse	1.1 (0.2–3.3)	27.4 (22.2–33.2)	< 0.0001
Financial abuse	11.3 (7.7–15.7)	24.8 (19.7–30.5)	< 0.0001
Sexual abuse	0 (0)	6 (3.5–9.6)	< 0.0001
Withholding of care	30.5 (25–36.4)	34.6 (28.9–40.6)	0.177
Elder abuse	39.1 (33.2–45.2)	80.5 (75.2–85)	< 0.0001

11.15, 95%, CI 1.68–73.69), or spouse and children (OR = 10.52, 95%, CI 1.93–57.19), living at home (OR = 22.77, 95%, CI 2.09–146.44), being dependent for basic activities of daily living (OR = 3.19, 95%, CI 1.66–6.10) and having signs of poor body and/oral hygiene.

Multiple correspondence analysis (MCA) can provide insight into which variables have greater influence on the dimension(s) of elder abuse as it permits the visualization of clusters and patterns within the sample. With MCA, the analysis reduces the data to three dimensions that account for 35.4% of the variance in the samples. Dimensions 1 and 2 of the MCA point to differences between the two populations. The differences in the profile of elder abuse in both countries are shown in Fig. 3a for all cases. The variables of dimension 1 have the highest inertia (0.147) and contribute most of the differences observed in elder abuse between both countries. Dimension 1 is the distribution of positive answers related with abuse. Dimension 2 is the distribution of sociodemographic variables. The Spanish population is grouped near the origin of the coordinates, which indicates greater homogeneity in the scores obtained for both dimensions. On dimension 1, the population of abused Iranian elders is greater than for the Spanish group, with a higher number of affirmative answers concerning psychological, physical,

financial and sexual abuse. On dimension 2, they are split into two subgroups, one on the positive side of the axis and other subgroup on the negative side of the axis, thus defining two different profiles of abuse. The variable contributing most to the positive part of dimension 2 are being widowed, living with children and living in the house of relatives, while being married contributes most to the negative part of dimension 2 (Fig. 3b).

Discussion

In our knowledge, this is the first study to compare the prevalence of elder abuse in a European and an Asian country using the same new statistical methodology. To avoid the possible confusion of characteristics such as age and sex between Spanish and Iranian subjects, a propensity score analysis was performed [20]. According to this, the prevalence of suspicion of abuse reported in our study by elderly people was 39.1% in Spain and 80.5% in Iran. If we extrapolate our results to the entire population of each country (2018), 4,694,520 people of 65 years and older in Iran (5.7% of the total population) and 9,184,577 people in Spain (19.5% of the

Table 4 Stepwise multivariate logistic regression analysis for any elder abuse among the elder populations

	Elder abuse in Spain OR (95% CI)	Elder abuse in Iran OR (95% CI)
Sex		
Men	1	---
Women	2.17 (1.36–3.48)	---
Age (group years)		
65-69	1	1
70-74	---	---
75-79	2.82 (1.62–4.91)	9.528 (3.055–29.713)
≥ 80	2.43 (1.35–4.39)	---
Living with		
Alone		1
Spouse	---	---
Children	---	11.15 (1.68–73.69)
Spouse + children	---	10.52 (1.93–57.19)
Other relatives	---	---
Accommodation		
Rotational	3.85 (1.45–10.23)	1
Home	1	22.738 (2.09–146.44)
House of relatives	1.94 (1.21–3.82)	---
Risk factors		
Functional disability for daily activities		
No	1	1
Yes	2.38 (1.33–4.27)	3.19 (1.66–6.10)
Physical examination		
Signs of poor body and/or oral hygiene		
No	1	1
Yes	4.01 (1.75–9.18)	3.47 (1.07–11.20)

total population) would be suffering elder abuse 3,779,088 older in Iran and 3,591,169 in Spain.

A recent systematic revision and meta-analysis suggests the global prevalence of elder abuse is 15.7%, that is, elder abuse seems to affect one in six older adults worldwide [9]. Among the reasons that help explain differences in the results are that investigations included collected past-year abuse prevalence in the above meta-analysis, while our data refer to events occurring after the person has reached the age of 65. In addition, the lack of consensus on the definition of situations that are considered abuse and the different methodologies used to identify the same complicate the comparison of results [23].

Logistic regression analysis showed that elder abuse and its subtypes, Neglect, Psychological Abuse, Physical Abuse and Financial Abuse are significantly more probable in Iran than in Spain. Globally, elder abuse is six times more likely among Iranian elders. The most notable difference concerns physical abuse, which was seen to be 15 times more likely in the Asian

country. In Spain, the withholding of care is the most frequent mistreatment (95% CI 25–36.4%), whereas in Iran psychological abuse is the subtype most commonly reported by adults (95% CI 46.8–56.1%). Although many authors do not include abandonment within the subtypes of abuse because of the difficulties in checking the data, or even for the elderly person to understand, the tool used in our study did include it [24]. Curiously, in both countries the prevalence of withholding care is 30–35% and is the only subtype of elder abuse that shows no statistically significant difference between the two countries.

The different specific social norms of each country and the dissimilar culture that governs the dynamics and expectations of family life and therefore relations with the elderly and their care may justify differences in the prevalence of elder abuse and its subtypes. This study showed the significant difference in elder abuse between Iran and Spain. However, we assume that the differences in culture may affect the definition of abuse. The respect to elder people, as a criterion of collectivism cultures, matters much more in Eastern countries compared to Westerners with individualistic culture. So, any small deviation of respectful behaviours can be considered as abuse in Iranians. In this regard, previous studies reveal considerable regional variations in the prevalence of elder abuse in different regions of the world [8, 9].

In Europe, the ABUEL study, designed to assess elder abuse in seven European countries, found differences in the prevalence of total elder abuse and subtypes between these countries. This is one of the very few cross-cultural studies available that have used a common elder abuse scale. The results concerning the subtypes of elder abuse coincide with the prevalence observed of our research [25].

No large study of elder abuse has been conducted in Iran, and although some groups have published studies using data obtained in different areas of the country, the fact that many of them are in Farsi (except for the abstract) poses difficulties for the dissemination of results in an international environment. Generally, people believe that elder mistreatment is not common in Iran because of the strong family ties in that culture [26]. However, the results of several investigations have shown that elder mistreatment is also a reality in Iran. Thus, in an Iranian population aged over 60 years mistreatment in the previous 12 months was reported by 14.7% of the participants, physical (70.4%) and neglect (61.4%) being the most common subtypes of total mistreatments [26]. Other authors obtained results similar to ours in the Iranian population, with at least 80% of the participants reporting some form of psychological abuse, financial abuse and/or neglect at least once during a 2-month period. Neglect and financial abuse was reported by 66% and 41% of the respondents, respectively [27]. In a systematic review of elder abuse across Asia, considerable variations were obtained in prevalence estimates, with figures ranging from 0.22 per 1000 to 62% [28].

Fig. 3 **a** Cases of suspicion of elder abuse labelled by country (n=318). **b** Joint plot of category points for the first two dimensions. Dimension 1 is the presence of positive answers of abuse, and dimension 2 is the distribution of sociodemographic characteristics. v32 v33 psychological abuse; v37 physical abuse; v35 sexual abuse; v38 v39 financial abuse
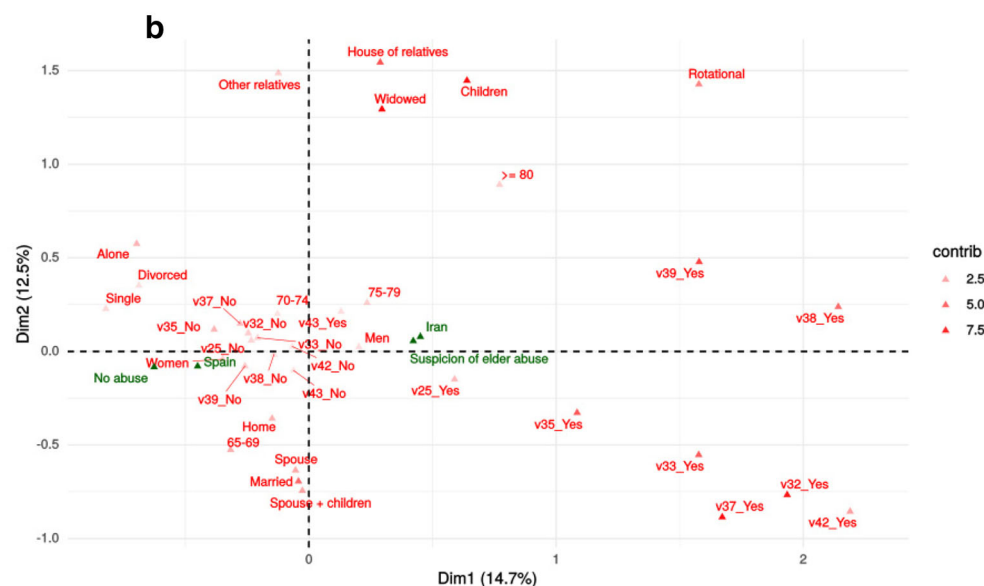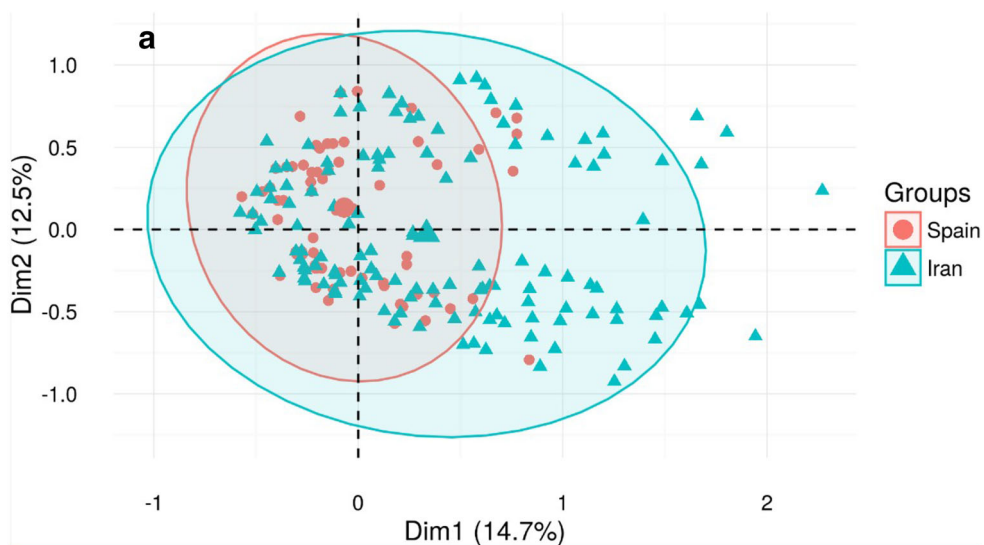
v32 v33 Psychological Abuse
v37 Physical Abuse
v35 Sexual Abuse
v38 v39 Financial Abuse

Recently, Abdi et al. [29] determine the prevalence of elder abuse from 2001 to 2018 in 15 articles by systematic review and meta-analysis. According to the findings of this study, in Iran the overall prevalence of elder abuse is 48.3%.

Five elder abuse risk factors, all related to problems in co-existence and mentioned in various investigations, showed significantly higher prevalence in the Iranian population. In our sample, the chronic diseases most prevalent in both countries were heart disease, hypertension, diabetes, hyperlipidemia, hypothyroidism and hyperthyroidism. The prevalence and any recent worsening of illness in the elderly were significantly higher in Iran than in Spain (53.8 vs 7.1), which would seem to reflect the fact that 80% of the cardiovascular disease (CVD) global burden have occurred in low- and middle-income countries (LMIC) mostly in the Eastern Mediterranean Region (EMR), where it has become a growing epidemic problem in recent years [30]. Iran may have the highest burden of CVD in the EMR [31]. The highest risk of CVD events is attributed to hypertension in the Iranian population [32].

Similarly, signs of dehydration/malnutrition and poor body and/or oral hygiene, symptoms frequently described in situations of abuse, are more common in Iranian elders than in Spaniards. In both countries, being 75–79 years old, dependent on basic activities of daily living and having signs of poor body and/oral hygiene found to significantly have increased risk of any type of abuse.

Multiple correspondence analysis allows the differences between patterns of elder abuse between both populations to be visualized. Although there is a profile shared by both groups, Iranian elders answered affirmatively to a greater number of questions as regards the subtypes of elder abuse. However, the profile of elder abuse is more homogeneous among the Spanish group. In the case of Iranian people, two distinct patterns are defined, one affecting married elders, and probably connected with financial abuse [33], and another pattern of abuse in which the victims are elderly widowed people who must live with their children. This situation is probably due to the lack of any social security system in Iran to protect and support the elderly, which means that they necessarily become dependent on their families [26].

Limitations

The study has several limitations that must be taken into account when interpreting these results. Firstly, its cross-sectional design means that we do not know about how abuse progresses over time. Longitudinal studies are needed to examine the incidence of elder abuse subtypes and the associated risk and protective factors. Secondly, the information regarding mistreatment was self-reported by victims, with the high degree of subjectivity that this entails. Thirdly, we did not include fragile elderly people who attend health centres less frequently because of their difficulties in movement, and also subjects with cognitive disorders that prevented the survey being conducted. Cultural difference is also a limitation.

Conclusion

The present results confirm that elder abuse is an urgent, important and growing problem in different countries and with different cultures. Although populations are ageing both in developed and developing countries, the fastest growth in this phenomenon is mainly evident in countries that have relatively recently been industrialized or are developing, so that raising awareness of the problem and taking steps to prevent its occurrence should be a priority in these countries. While some characteristics are shared in the pattern of abuse, there are different profiles between the two countries which should be the subject of more research.

Identification and management of elder abuse have forensic and medicolegal implications. The clinical report is a fundamental piece for the elaboration of forensic report. Detecting elder abuse should be a priority objective in clinical and forensic setting, since healthcare professionals and forensic practitioners may be the only people in victims' lives with the opportunity to recognize abuse.

Compliance with ethical standards

This study was approved by the Research Ethics Committee of Murcia University (Spain) (approval ID 2048/2018) and by Research Ethics Committee Kermanshah University of Medical Sciences (approval ID: IR.KUMS.REC.1399.606).

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Yunus RM, Hairi NN, Choo WY (2017) Consequences of elder abuse and neglect: a systematic review of observational studies. Trauma Violence Abuse 20:197–213. https://doi.org/10.1177/1524838017692798

2. Burnett J, Jackson SL, Sinha AK, Aschenbrenner AR, Murphy KP, Xia R, Diamond PM (2016) Five-year all-cause mortality rates across five categories of substantiated elder abuse occurring in the community. J Elder Abuse Negl 28:59–75. https://doi.org/10.1080/08946566.2016.1142920

3. Pillemer K, Connolly MT, Breckman R, Spreng N, Lachs M (2015) Elder mistreatment: priorities for consideration by the White House Conference on Aging. Gerontologist 55:320–327. https://doi.org/10.1093/geront/gnu180

4. Kydd A, Fleming A (2015) Ageism and age discrimination in health care: fact or fiction? A narrative review of the literature 2015. Maturitas 81(4):432–438. https://doi.org/10.1016/j.maturitas.2015.05.002

5. Hajek A, Brettschneider C, Lange C, Posselt T, Wiese B, Steinmann S, Weyerer S, Werle J, Pentzek M, Fuchs A, Stein J, Luck T, Bickel H, Mösch E, Wagner M, Jessen F, Maier W, Scherer M, Riedel-Heller SG, König HH, AgeCoDe Study Group (2015) Longitudinal predictors of institutionalization in old age. PLoS One 10(12):e0144203. https://doi.org/10.1371/journal.pone.0144203

6. Pillemer K, Burnes D, Riffin C, Lachs MS (2016) Elder abuse: global situation, risk factors, and prevention strategies. Gerontologist 56(S2):S194–S205. https://doi.org/10.1093/geront/gnw004

7. Chalise HN (2017) Abuse of the elderly: a neglected issue in developing countries. J J Geronto 3:024 https://www.academia.edu/31857266/Elderly_abuse_A_Neglected_Issue_in_Developing_Countries

8. Dong XQ (2015) Elder abuse: systematic review and implications for practice. JAGS 63:1214–1238. https://doi.org/10.1111/jgs.13454

9. Yon Y, Mikton CR, Gassoumis ZD, Wilber KH (2017) Elder abuse prevalence in community settings: a systematic review and meta-analysis. Lancet Glob Health 5:e147–e156. https://doi.org/10.1016/S2214-109X(17)30006-2

10. Pfeiffer E (1975) A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriatr Soc (AGS) 23:433–441. https://doi.org/10.1111/j.1532-5415.1975.tb00927.x

11. Martínez de la Iglesia J, Dueñas Herrero R, Onís Vilchesa C, Aguado Taberné C, Albert Colomer CA, Luque Luque R (2001) Adaptación y validación al castellano del cuestionario de Pfeiffer (SPMSQ) para detectar la existencia de deterioro cognitivo en personas mayores de 65 años. Med Clin 117:129–134. https://doi.org/10.1016/S0025-7753(01)72040-4

12. Adib-Hajbaghery M, Izadi-Avanji F, Akbari H (2012) Quality of sleep and its related risk factors in hospitalized older patients in Kashan's Hospitals, Iran 2009. Iran J Nurs Midwifery Res 17: 414–420 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3733285/

13. Dong X, Simon MA (2013) Elder abuse as a risk factor for hospitalization in older persons. JAMA Intern Med 173:911–917. https://doi.org/10.1001/jamainternmed.2013.238

14. Amstadter AB, Zajac K, Strachan M, Hernandez MA, Kilpatrick DG, Acierno R (2011) Prevalence and correlates of elder mistreatment in South Carolina: the South Carolina Elder Mistreatment Study. J Interpers Violence 26:2947–2972. https://doi.org/10.1177/0886260510390959

15. Gibss LM (2014) Understanding the medical markers of elder abuse and neglect: physical examination findings. Clin Geriatr Med 30:687–712. https://doi.org/10.1016/j.cger.2014.08.002

16. Lofasso VM, Rosen T (2014) Medical and laboratory indicators of elder abuse and neglect. Clin Geriatr Med 30:713–728. https://doi.org/10.1016/j.cger.2014.08.003

17. Petti S (2018) Elder neglect – oral diseases and injuries. Oral Dis 24:891–899. https://doi.org/10.1111/odi.12797

18. Keller E, Santos C, Cusack D, Väli M, Ferrara D, Ludes B, Mangin P, Payne-James JJ, Vieira DN (2019) European Council of Legal Medicine (ECLM) guidelines for the examination of suspected elder abuse. Int J Legal Med 133:317–322. https://doi.org/10.1007/s00414-018-1880-y

19. Pérez-Cárceles MD, Rubio L, Pereniguez JE, Pérez-Flores D, Osuna E, Luna A (2009) Suspicion of elder abuse in South Eastern Spain: the extent and risk factors. Arch Gerontol Geriatr 49:132–137. https://doi.org/10.1016/j.archger.2008.06.002

20. Sekhon JS (2011) Multivariate and propensity score matching software with automated balance optimization: the matching package for R. J Stat Softw 2011. Available at SSRN: https://ssrn.com/abstract=1009044

21. Lê S, Josse J, Husson F (2008) FactoMineR: an R package for multivariate analysis. J Stat Softw 25:1–18 http://www.jstatsoft.org/

22. Husson F, Lê S, Pagès J (2011) Exploratory multivariate analysis by example using R. Chapman and Hall. CRC Press

23. Aday RH, Wallace JB, Scott SJ (2017) Generational differences in knowledge, recognition, and perceptions of elder abuse reporting. Educ Gerontol 43:568–581. https://doi.org/10.1080/03601277.2017.1376382

24. Schofield MJ (2017) Screening for elder abuse: tools and effectiveness. In: Dong X (ed) Elder Abuse. Springer, Cham, pp 161–199

25. Fraga S, Lindert J, Barros H, Torres-González F, Ioannidi-Kapolou E, Melchiorre MG, Stankunas M, Soares JF (2014) Elder abuse and socioeconomic inequalities: a multilevel study in 7 European countries. Prev Med 61:42–47. https://doi.org/10.1016/j.ypmed.2014.01.008

26. Alizadeh-Khoei M, Sharifi F, Hossain SZ, Fakhrzadeh H, Salimi Z (2014) Elder abuse: risk factors of abuse in elderly community-dwelling Iranians. Educ Gerontol 40:543–554. https://doi.org/10.1080/03601277.2013.857995

27. Oveisi S, Karimi R, Mahram M (2014) Note from Iran: self-reported elder abuse in Qazvin, 2012. J Elder Abuse Negl 26: 337–340. https://doi.org/10.1080/08946566.2014.883947

28. Yan E, Chan KL, Tiwari A (2015) A systematic review of prevalence and risk factors for elder abuse in Asia. Trauma Violence Abuse 16:199–219. https://doi.org/10.1177/1524838014555033

29. Abdi A, Tarjoman A, Borji M (2019) Prevalence of elder abuse in Iran: a systematic review and meta-analysis. Asian J Psychiatr 39: 120–127. https://doi.org/10.1016/j.ajp.2018.12.005

30. WHO (2010) Global status report on noncommunicable diseases. Geneva: WHO, 2011

31. Gaziano TA, Bitton A, Anand S, Abrahams-Gessel S, Murphy A (2010) Growing epidemic of coronary heart disease in low- and middle-income countries. Curr Probl Cardiol 35(2):72–115. https://doi.org/10.1016/j.cpcardiol.2009.10.002

32. Sarrafzadegan N, Talaei M, Sadeghi M, Kelishadi R, Oveisgharan S, Mohammadifard N, Sajjadieh AR, Kabiri P, Marshall T, Thomas GN, Tavasoliet A (2011) The Isfahan cohort study: rationale, methods and main findings. J Hum Hypertens 25(9):545–553. https://doi.org/10.1038/jhh.2010.99

33. Garre-Olmo J, Planas-Pujol X, Lopez-Pousa S, Juvinya D, Vilà A, Vilalta-Franch J, Frailty and dependence in Girona Study Group (2009) Prevalence and risk factors of suspected elder abuse subtypes in people aged 75 and older. J Am Geriatr Soc 57:815–822. https://doi.org/10.1111/j.1532-5415.2009.02221.x