

Prediction of Subjective Memory Complaints Based on Cognitive Functioning and Subjective Health Complaints of the Elderly People

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Abstract

Objective: The main objective of this study is to analyze how subjective memory complaints can be predicted by cognitive functioning, subjective health complaints and instrumental activities of daily living of the elderly people.

Methods: A total of 140 elderly people were considered in the study, with an average age of 74 years (± 9.67), mostly female. The study protocol collected sociodemographic information from the participants and evaluated subjective memory complaints, cognitive functioning, subjective health complaints and instrumental activities of daily living.

Results: Subjective memory complaints showed a significant correlation with subjective health complaints, instrumental activities of daily living, and general cognitive functioning. In addition, it was also verified that cognitive functioning and subjective health complaints are predictors of subjective memory complaints.

Conclusions: Good cognitive functioning is a protective factor against subjective memory complaints, while the presence of health complaints in general, can impair good memory functioning in elderly people.

Keywords: Subjective Memory Complaints; Cognitive Functioning; Subjective Health Complaints; Instrumental Activities of Daily Living, Elderly People

Introduction

The number of elderly people has been increasing worldwide. According to the United Nations [1] "by 2050, 1 in 6 people in the world will be over the age of 65" and in the past year of 2019, the number of elderly people aged 65 and over was 703 million persons. Subjective memory complaints are one of the most frequent symptoms in elderly people [2]. After the age of 50, many cases of adults reveal subjective memory complaints [3]. The literature indicates that the presence of subjective cognitive complaints, including memory, may be related to pathological conditions, for example, Alzheimer's disease or cognitive impairment [4,5], but not always this happens [6]. Personality characteristics [7], anxiety, depression [8,9] or mood [9] may also be associated with subjective memory complaints. In addition, the study by Bernardes, *et al.* [10], revealed that the subjective memory complaints are correlated with the negative perception that the subjects have of their memory, as well as with the time when the complaints are present. Vaskivuo, *et al.* [11], verified that the subjective memory complaints of the prospective and retrospective types are related to a slower processing speed of the elderly people, which interferes with their daily activities. In the study by Meyer, *et al.* [12], 19% of participants said that memory problems interfered 34% a little, 19% somewhat, and 19% a great deal with their lives. In fact, when there is a cognitive impairment, including memory, the probability of other types of difficulties is increased, such as in the performance of instrumental activities of daily living, which affects people's well-being and quality of life [13,14]. Jorm, *et al.* [15] showed that 10.1% of the subjects evaluated in their study, aged between

60 and 64 years, had subjective memory complaints that interfered with their activities of daily living. Furthermore, subjective memory complaints can be associated with poor mental health [13]. When there are mental health problems, there is a higher probability of nursing home placement [16], an increase in the use of medical health services [17] and higher costs of health care utilization over time [18]. In the study by Waldorff, *et al.* [19], the elderly people who seek their family doctor for their health problems, 24% reported memory complaints. People with a greater number of diseases have a more negative perception of their health, and the set of morbidities may be negatively associated with their cognitive performance [20]. Subjective memory complaints are more frequent in subjects who use health services more regularly and with less functional activity, a consequence of the problems they suffer from [21]. For example, cardiovascular or musculoskeletal problems affect activities of daily living and instrumental activities of daily living, whose difficulties tend to increase over time [22]. Elderly people with subjective memory complaints who seek professional help have a weaker health condition than those who do not seek this type of help [23].

Although subjective memory complaints may be related to cognitive activity [4], the functioning of activities of daily living [14] or health problems [9,20], it remains necessary to know the predictive power of cognitive functioning, instrumental activities of daily living and subjective health complaints in subjective memory complaints. Thus, the main objective of this study is to verify whether cognitive, functional activities and general health variables are predictors of subjective memory complaints, and what is their joint effect in explaining subjective memory complaints in elderly people.

Methods

Participants

The study sample consists of 140 elderly people who live community-dwelling in the Lisbon region. This sample has a mean age of 74 years (± 9.67). 59.3% of the subjects are female and 40.7% are male. As for the level of education, 10% have no studies, 57.1% have the 1st cycle of basic education (4 years), 6.4% have the 2nd cycle of basic education (6 years), 10% the 3rd cycle of basic education (9 years), 7.9% secondary or technical education and 8.6% higher education. As for marital status, 5.7% are single, 50.7% are married, 12.1% are divorced and 31.4% are widowed. 72.9% admit not living alone (e.g., living with a spouse or children) and 27.1% live alone. As inclusion criteria, only individuals aged 65 years or older, with subjective memory complaints (> 4 according to the scale used) and who signed an informed consent to participate in the study were considered. Subjects with cognitive and functional disabilities that did not allow them to respond to the assessment protocol were excluded from the study.

Measures

The protocol of the present study consisted of a sociodemographic questionnaire, the subjective memory complaints scale [24], the Mini Mental State Examination (MMSE) [25], the Instrumental Activities of Daily Living Scale (IADL) [26] and the Subjective Health Complaints Scale (QHC) [27]. Through the sociodemographic questionnaire it was possible to collect information about the participants, namely age, gender, education, marital status, etc. The subjective memory complaints scale evaluated the subjective memory complaints through a total of ten questions. Scores on the instrument range from 0 to 3, with a maximum of 21 points. For values greater than 4 points, significant memory complaints are considered. As for its psychometric characteristics, this instrument has a Cronbach's $\alpha = 0.83$. General mental functioning was assessed using the MMSE. This instrument, with good intra- and inter-observer validity and reliability, assesses cognitive abilities such as: orientation, retention, attention and calculation, evocation, language and constructive capacity. It consists of 30 questions with a score ranging between 0 and 30 points. The higher the score obtained, the better the subjects' general cognitive functioning. Instrumental Activities of Daily Living Scale evaluated the instrumental activities of daily living: using the telephone, shopping, preparing meals, doing household chores, washing clothes, using transport, knowing how to use medication, dealing with economic matters. The higher the score obtained, the greater the level of subjects' dependence on activities. In the version used, the authors point

out good psychometric characteristics with a Cronbach's $\alpha = 0.92$. The Subjective Health Complaints Scale allowed us to analyze a total of 29 physical symptoms, assessed on a 4-point scale. This scale consists of five dimensions (gastrointestinal problems, flu, musculoskeletal pain, pseudo neurology and allergy) and can be answered through self-report. According to the authors, the scale has satisfactory psychometric qualities with good internal consistency results ($\alpha = 0.88$).

Procedure

This observational, cross-sectional and descriptive study had the collaboration of institutions that provide care or support to the elderly people. The objectives of the study were presented to the respective directions that, after agreeing to collaborate with the research, allowed the elderly people to be in contact. Participants were contacted and informed of the ethical and deontological duties inherent to the investigation, as well as the absence of risks inherent to their participation in the study. Participation was completely voluntary, and they could withdraw from the study whenever they wanted. The application of the study protocol took place at the collaborating institutions, in a room designed for this purpose. Anonymity, privacy and confidentiality of participants' information was ensured.

Data analysis

For data analysis, the Statistical Package for Social Sciences, version 27 for Windows (IBM Portugal) was used. Sociodemographic data were analyzed through descriptive statistical analysis using the calculation of mean and standard deviations for quantitative variables and calculation of frequencies and percentages for nominal or ordinal variables. Pearson's correlation coefficient was used to analyze the correlations between variables: subjective memory complaints and subjective health complaints, instrumental activities of daily living and cognitive functioning. The estimation of the magnitude and sign of impact of each independent variable on the estimated value of subjective memory complaints (adjusting for the other independent variables) was performed using multiple linear regression analysis. The explanatory variables that showed a significant correlation with subjective memory complaints were introduced in the regression model. The statistical assumptions corresponding to the different tests used were ensured. The confidence level adopted was $p < .05$.

Results

Correlation between subjective memory complaints, subjective health complaints, instrumental activities of daily living and cognitive functioning

Subjective memory complaints show a positive and significant relationship with subjective health complaints ($r = .373, p \approx .001$), a negative and significant relationship with instrumental activities of daily living ($r = -.233, p = .029$) and a negative and significant relationship with general cognitive functioning ($r = -.486, p \approx .001$).

Prediction of subjective memory complaints

The results obtained through the Multiple Linear Regression Model are presented. The explanatory variables significantly correlated with subjective memory complaints were considered in the model (Table 1).

Step 1 (R ² = .252)	B	SE	P	VIF	DW
	-	-	-	-	1.670
Constant	9.424	2.840	.001	-	-
MMSE	-.227	.070	.002*	1.101	-
QHC	.085	.035	.018*	1.084	-
IADL	-.302	.171	.082	1.023	-

Table 1: Variable coefficients: cognitive functioning, subjective health complaints and instrumental activities of daily living.

Note: B=unstandardized Beta Coefficients; SE= standard error (unstandardized Coefficients); P = p-value (*.05); MMSE = Mini Mental State Examination; QHC=Subjective health complaints; IADL= Instrumental Activities of Daily Living.

Step 1. Equation estimated by the method of ordinary least squares:

$$= 9.424 - 0.227MMSE + 0.085QHC - 0.302IADL.$$

The adjusted impact of general cognitive functioning on subjective memory complaints is negative and equals -0.227, which means that when mental functioning increases by one-unit, the estimated value of subjective memory complaints decreases by 0.227, adjusted for the other variables. The adjusted impact of subjective health complaints is positive and equal to 0.085, which means that when subjective health complaints increase by one-unit, subjective memory complaints increase by 0.085, adjusting for the other variables. Thus, for a significance level of 5%, cognitive functioning and subjective health complaints are important variables to explain subjective memory complaints, as they reveal a statistically significant coefficient ($p < .05$). In view of the goodness of fit of the model (R^2), it can be said that 25.2% of the variability of subjective memory complaints is explained by the estimated model.

Discussion

The main objective of this study was to analyze whether cognitive functioning, instrumental activities of daily living and subjective health complaints were predictors of subjective memory complaints. According to the results obtained, it is possible to prove the significant effect of cognitive functioning and subjective health complaints, which means that they are predictors of subjective memory complaints in elderly people. According to the study by Jorm., *et al.* [15], there may be an overall predictive effect on subjective memory complaints by a set of variables simultaneously, including cognitive functioning and physical health. However, the predictive effect of cognitive functioning on subjective memory complaints may not be verified when this explanatory variable is independently assessed in the prediction model. According to Yassuda., *et al.* [28], cognitive malfunction has effects on memory and may affect different types of memory in different ways. In addition, there may be other factors (e.g., depression, anxiety or neuroticism) that explain subjective cognitive complaints, including memory, more than cognitive performance [6]. With regard to subjective health complaints, Jorm., *et al.* [15], showed that physical health is a significant predictor of subjective memory complaints. Montejo., *et al.* [29], found in a sample of elderly people, aged between 65 and 87 years, that the perception of health is a predictor of subjective memory complaints, which reinforces the existence of an association between subjective memory complaints and self-rated health of elderly people [30]. Subjective memory complaints can also be associated with multimorbidity, use of medication, different clinical conditions [21] or a worse health status [31]. With regard to instrumental activities of daily living, these did not prove to be a predictor of subjective memory complaints, although the correlation between them was significant. The study by Cordier., *et al.* [22] also revealed a significant relationship between subjective memory difficulty and activities of daily living and instrumental activities of daily living. The authors showed that higher levels of memory complaints, greater levels of difficulty in performing daily life activities tasks. With regard to instrumental activities of daily living, this study also proved that subjects with higher levels of memory complaints also had significantly higher levels of difficulty in performing IADL tasks. Changes in memory complaints were positively associated with difficulties in IADL over time.

This study can help to identify determinant variables in the appearance of subjective memory complaints in elderly people. It is known that the presence of subjective memory complaints affects people's daily lives, which can compromise the independent performance of their daily tasks [22]. Thus, it is possible to help prevent these problems through the implementation of preventive programs or the stimulation of memory skills, which may help to promote, for a longer time, autonomy in the daily life of the elderly people. However, the fact that this study does not identify what type of memory complaints may be present, does not measure the time these complaints elapse, does not identify the possible number of possible pathologies in elderly people or the effects of taking medications on cognitive functioning, may be limitations to be considered in this study. Thus, future investigations should understand the predictive effect of this type of variables over time, in different types of memory, identifying the presence of physical pathologies and measuring the effects of the medicines on subjective memory complaints.

Conflicts of Interest in this Study

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