http://dx.doi.org/10.1590/1981-22562018021.170191

The link between cognitive state and general self-esteem among institutionalized elderly persons: can health condition serve as a mediating factor?

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Abstract

Objective: to assess whether the health condition of an elderly person can serve as a mediating factor between the cognitive state and general self-esteem of the institutionalized elderly. *Method:* a quantitative, cross-sectional correlational study was performed, based on the path analysis technique. The following instruments were used for data collection: the Mini-Mental State Examination, the Tinetti Performance Oriented Mobility Assessment, the Mini Nutritional Evaluation and the Rosenberg Self-Esteem Scale. *Results:* the sample was composed of 312 elderly patients of both genders (112 men and 200 women), with an average age of 83.39 (±7.09) years. Most of the elderly persons were widowed, with a low educational level, and had been institutionalized in Residential Care Facilities for the Elderly for on average 54.6 (±51.69) months. The mediating factor of health condition renders the link between the cognitive state and self-esteem of the elderly null. However, the analysis of the decomposition of the effects showed a significant indirect effect between the cognitive state and health condition. The total effect of cognitive state on the health condition of the elderly is significant, positive and direct. *Conclusion:* based on the results of this study we maintain that cognitive changes can affect the nutritional state and physical balance of the institutionalized elderly.

Keywords: Health Status. Cognition. Health of Institutionalized Elderly. Self-Esteem.

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INTRODUCTION

Many chronic diseases typical of old age are a threat to autonomy and independence[1]. These illnesses can lead to frailty, functional disability, institutionalization and even death.

Functional disability, with consequent loss of autonomy, represents a window of opportunity for the development of more meaningful nursing for the elderly, families and society[1-3]. Maintaining functionality plays a protective role in the process of physical, mental and social deterioration[4], ensuring the independence and autonomy required for healthy aging[5].

As age increases, there is a loss of concentration, memory and vital energy[6]. Deficits in cognitive performance are one of the most frequently mentioned factors in literature, with negative implications for the self-esteem of the elderly[7], especially memory disorders[8].

Self-esteem is a fundamental component of emotional survival[6] and an indicator of mental health, as it affects affective, social and psychological conditions[9].

Another factor that influences health condition is nutritional status[10,11], which is an indicator of health that is interrelated with several functions, including physical and psycho-cognitive capacity[12]. The consequences of malnutrition lead to changes in muscle function, a decrease in bone mass and the reduction of cognitive function, with a major impact on the physical and emotional condition of the elderly population[13]. An unhealthy nutritional pattern influences the functionality and well-being of the elderly, particularly those who are institutionalized[14].

Another relevant factor in health condition is body balance. Chronic-degenerative diseases are often associated with structural alterations that compromise posture and balance. Insecurity caused by body imbalance can lead to psychic changes such as irritability, loss of self-confidence, anxiety, depression and loss of self-esteem. Body balance disorders also lead to a restriction in daily and social life activities, which in turn are reflected in self-esteem[15,16].

Based on the above, the evaluation of the health condition must have an all-encompassing and multidimensional approach, including a physical, nutritional and cognitive assessment[17].

The present study aims to test whether the health condition of the elderly is a mediating factor in the association between cognitive state and self-esteem in institutionalized elderly persons.

The objective of this investigation is therefore translated into the following research question: does health status play a mediating role in the association between cognitive state and global self-esteem in the institutionalized elderly?

METHOD

A cross-sectional, exploratory *ex-post facto* study was performed. The typology of the study was random correlational, using the path analysis methodology (in a more *lato* sense for the methodologies of structural questions) to test the respective research question.

The participants of the study were from a region in the north of Portugal, Trás-os-Montes and Alto Douro, and were institutionalized in Long Term Care Facilities for the Elderly (LTCF).

A mapping of the LTCFs in the district of Vila Real was carried out based on the Social Charter[18]. A total of 56 such institutions were found, with legal status of Private Corporate Institutions. Telephone contact was made with the management of each institution to schedule a meeting for the presentation of the study and its objectives. A total of 25 institutions agreed to participate.

The sampling method used in data collection was of the simple random type. Each elderly person was assigned a number and a random selection of 30% of participants resident in each institution was made. This percentage was reset whenever the elderly person or their legal representative did not agree to participate in the study.

Data collection was carried out between August 2014 and July 2015, and was performed by the first author in a suitable location made available in each of the participating institutions.

The inclusion criteria were age 65 or older, of both genders, who were institutionalized in a LTCF and were available to participate in the study. Participants with cognitive deficit were excluded.

The Mini-Mental State Examination (MMSE) developed by Folstein et al.[19] in 1975 and adapted for the Portuguese population[20] was used to evaluate the cognitive ability of the participants. The MMSE has 30 questions, with one point assigned for each correctly issued response. The cut-off values for the Portuguese population were redefined in 2009[21]. This procedure is based on the literacy qualifications of the subjects stating that 22 points refers to between zero and two years of literacy, 24 relates to three to six years of literacy and 27 points is the cut-off value for elderly persons with seven or more years of literacy.

Body balance was evaluated using the Portuguese version of the *Tinetti Perfomance – Oriented Mobility Assessment* (POMA I)[22]. POMA I evaluates predisposition to falls through a set of tasks related to mobility and balance. The instrument has two aspects: the evaluation of static equilibrium by means of nine items (Tinetti Index)[23], two of which are scored between 0 and 1 and seven of which are scored between 0 and 2. The dynamic balance evaluation uses 10 items, eight of which are scored between 0 and 1 and two of which are scored between 0 and 2. In this study, the static balance subscale was used.

The nutritional evaluation of the participants was carried out using the questionnaire developed by the Nestlé Nutrition Institute (NNI), the Mini Nutritional Assessment (MNA)[24]. The instrument is composed of 18 questions, divided into two parts and grouped into four categories: anthropometric measurements, global assessment, dietary assessment and self-assessment of nutritional problems and health status. In the first phase, the MNA performs a screening with six questions assessing food intake, weight loss in the last three months, mobility, psychological stress or acute illness in the last three months, neuropsychological problems and body mass index (maximum score of 14 points). In the second phase, the questionnaire evaluates overall nutrition via 12 questions (maximum score of 16 points). Each question receives 1 point. The higher the overall score, the more fragile the nutritional status of the elderly person. This instrument has been translated, adapted and validated for the Portuguese population[25].

Overall self-esteem was evaluated with the Portuguese version of the Rosenberg Self-Esteem Scale (RSES)[26]. The RSES is a global measure of self-esteem consisting of ten items, five of which have a positive orientation and five of which have a negative orientation. The current response format is Likert-based with four response alternatives[26].

A sociodemographic questionnaire was used to collect data such as age, gender, marital status, schooling, time of institutionalization and daily medication consumption.

The mediator variable is health condition, which consists of the scores obtained in the MNA and POMA I, the predictive variable formed by cognitive ability and the criterion variable by the RSES scores. The statistical analysis used in this study was path analysis.

The sample used in this study was greater than that required *a priori* (N=100) for an analysis with an effect power of 0.1, a desired statistical power level of 0.8, using a latent variable and four observed variables, at a stipulated probability of 0.05. The testing of the mediating nature of health condition was performed through the Baron and Kenny method[27], namely the evaluation of the significance of the paths between predictor and mediator, predictor and criterion and also mediator and criterion. From this point, the significance of the Sobel test was tested[28] considering the non-standard regression values and standard error. The fit of the data to the tested model used several indices of goodness of fit according to the practices recommended for evaluation of the models of structural equations[29], namely chi-squared value (and degrees of freedom), chi-squared significance, the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), the Root Mean Square Error of Approximation (RMSEA) and its confidence interval a of 90%.

Taking into account the age and schooling limitations of the participants, the questionnaires were administered in interview form. Ethical principles, including the confidentiality and secrecy of the data acquired (both in the collection and the treatment

of the data) were safeguarded. Free and informed consent was requested from the participants after personal clarification of the nature and objectives of the research. This project was approved by the Ethics Committee of the Instituto de Ciências Biomédicas Abel Salazar under registry number 166/2016.

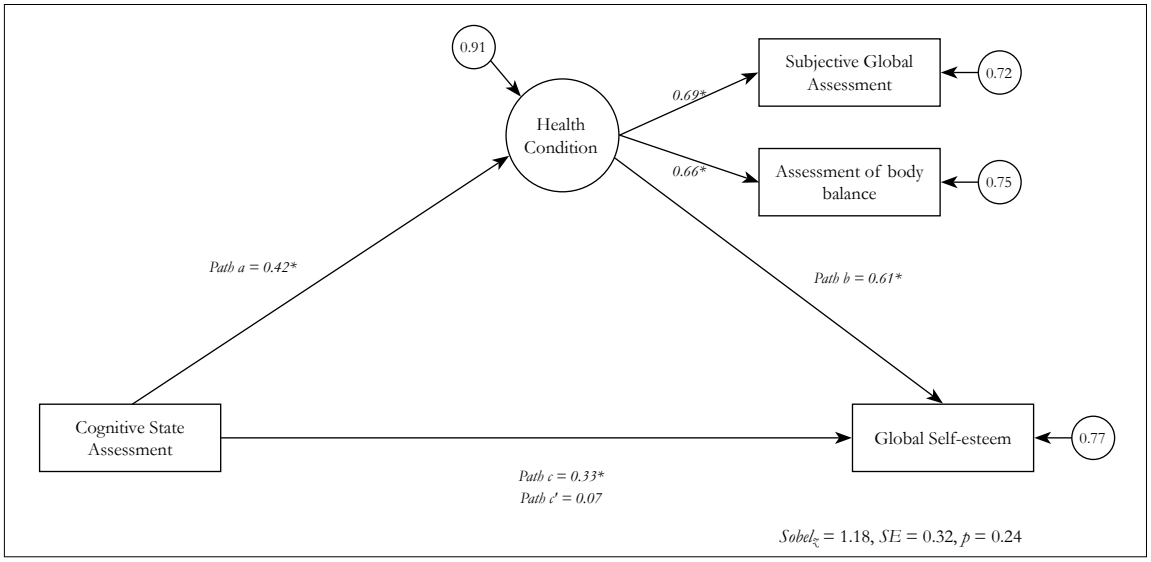
RESULTS

The sample consisted of 312 participants of both genders (112 men and 200 women), with a minimum age of 65 years and a maximum of 104 years [M =83.39; (+7.09)]. In terms of marital status, 17.30% (n=54) of the participants were married or in civil unions; 20.80% (n=65) were single; 59.90% (n=187) were widowers and 1.9% (n=6) were divorced. About half (49.90%, n=149) of the respondents were illiterate and 43.50% (n=135) reported three or four years of schooling. Only 4.4% (n=14) of the participants had more than five years of schooling. On average, the participants presented a history of institutionalization in their current facilities of 54.60 (+51.69) months. The daily consumption of medications was seven per day [M=7,10; (+3.19)]. Many of the participants had cognitive impairment (73.40%, n=229).

Health condition was tested as a mediator variable, having been constructed as a latent variable. The indicators introduced in this analysis were the Selective Global Assessment (SGA) and the Body Balance Assessment (BBA). The predictive variable in the study was cognitive ability assessed through the MMSE. The criterion or dependent variables are RSES scores (self-esteem) (Figure 1).

Path model - assumptions of mediation according to the classic four-step approach of Baron and Kenny[27]

The regression values between the variables of the model were initially tested and the associations recorded significant and positive values between: the predictor variable and the mediator variable, the mediator variable and the criterion variable between the predictor variable and the criterion variable. The Sobel test result indicated, however, that there was no mediation. Figure 1 summarizes the results.

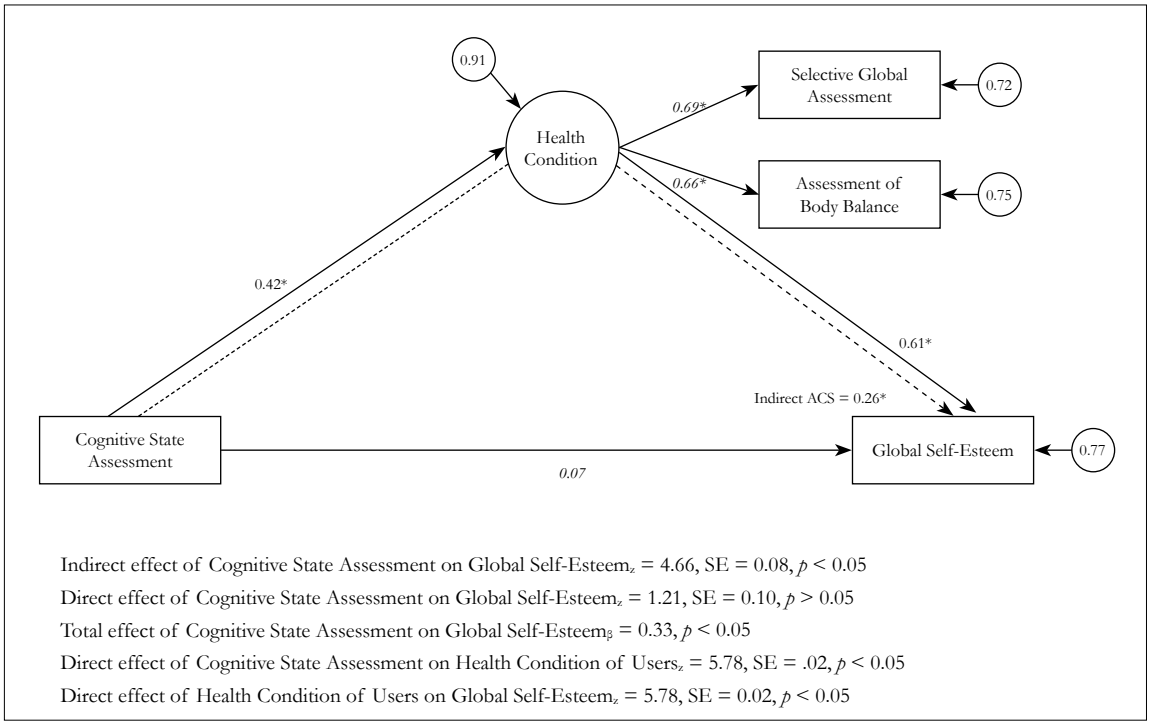


Regression, error, and disturbance values are standardized. Sobel$_z$ = z value of the Sobel test; SE = standard error; Values that do not have an asterisk are not significant (p>0.05); *p<0.05.

Figure 1. Test of mediation of health condition on the association between cognitive state assessment and global self-esteem.

The analysis of the decomposition of the effects indicated the significant indirect effect of cognitive state on self-esteem via health condition. The value of this effect was tested by subtracting the standardized values of the indirect effect from the value of the total predictor effect, revealing a small and non-significant direct value of the cognitive state assessment in global self-esteem. The total predictor impact on overall self-esteem is significant and of moderate magnitude, however. The results show that there is no mediation in the model.

Cognitive state had a positive effect on the health condition of the respondents. The model also indicates the existence of a significant, positive and elevated total effect of health condition on self-esteem. The total value of the weight of health condition in self-esteem is significant and positive although moderate. According to the total model, the standardized impact represented by the regression value which associates predictor and criterion directly is not significant. Figure 2 shows the total model and respective standardized beta values.



The dashed and dotted line are presented as indirect paths of the model (i.e., the indirect effects of the predictor variable on the criterion, via health condition, β=0.26); Regression, error, and disturbance values are standardized. The solid line shows the direct paths of the predictor variables, the variable tested as a mediator (β=0.42) and the criterion (β=0.07). The direct effect of the evaluation of health condition on the criterion is β=0.61; CSA = cognitive state assessment; SE = standard error, *$p \leq 0.05$.

Figure 2. Final model tested, showing direct and indirect effects.

DISCUSSION

Initially, it should be noted that the present study found no evidence of the mediation of health status in the association between cognitive state and global self-esteem. However, the positive effect of cognitive state on health condition was found, according to the authors, who report that the cognitive state has an effect on health status, well-being, quality of life and self-esteem. It is thus verified that the decline of cognitive state is a predisposing factor to a fragile health condition[30].

The impact of health status on self-esteem was shown to be significantly positive in this study. For some authors, the effects of aging, added to reduced

functionality, nutritional changes and body balance, often accompanied by a sedentary lifestyle, may result in losses in the health and quality of life of the elderly[14,16]. This multiplicity of associated factors leads to anticipated reductions in autonomy, the need for personal care and in some circumstances the impairment mobility, with the latter resulting in predictors of low levels of self-esteem[31]. These authors[31] recognize that the aging process entails the risk of the impairment of nutritional status, a danger that increases exponentially in the institutionalized elderly. There is a correlation between health condition and self-esteem, so studies should focus on the identification of factors that can be additional predictors of self-esteem deficits in the elderly[32]. Sedentarism, resulting from the decline of body balance, combined with a nutritional deficit, is associated with a reduction in functional capacity[16]. If, on the one hand, literature recognizes that the impairment of mobility may affect nutritional status, it also recognizes that there is a dispersion effect to this association, resulting in deficits in quality of life that negatively affect the self-esteem of the elderly[10,14]. Another study broadens the scope of these variables, stating that body balance disorders have a negative impact on social autonomy, activities of daily living, physical and mental security, and self-confidence, which in turn have a negative correlation with the well-being and self-esteem of the elderly[33]. Caveiro et al.[16] present evidence that body imbalance is one of the main factors that compromise the health status of the elderly, which is due to the reduction in participation in social activities and self-care, leading to emotional and psychic suffering.

It is also important to discuss the results of the adjustment of the data to the model given by the high RMSEA value, which is considered mediocre (RMSEA>0.06, with a greater upper limit in the IC_{RMSEA} *90% ≥0.08).* It should be noted that in samples that are considered large and with a high complexity model (perhaps considering here the existence of a latent factor with two indicators of different qualities) the RMSEA value increases, being one of the explanatory factors for the high value obtained. However, it should be reiterated that the other indexes of goodness of fit were adequate and even high for the cut-off values normally attributed to them.

The limitations of this study are mainly based on the type of sample, which was composed exclusively of elderly people institutionalized in non-profit facilities and limited to a region of northern Portugal, Trás-os-Montes and Alto Douro, making it impossible to generalize the results for the Portuguese population, and the use of a cross-sectional design that does not allow cause and effect relationships to be established. In future studies the inclusion of institutionalized elderly persons from other regions of the country is suggested, along with the comparative inclusion of elderly persons where care is provided through alternative solutions to hospitalization and the use of private hospitalization institutions.

CONCLUSION

This study reinforces the idea that the aging process interferes with the health condition, either through the diversity of physiological changes that occur, or the variability of intrapersonal variables, the psychological specifics of the elderly, or even through the specific social context of the same. The results support the assumption that cognitive and behavioral changes may affect the nutritional status and body balance of the elderly. In terms of nutritional status and cognitive capacity, there is a cause and effect circle with constant feedback, that is, nutritional impairments have a negative influence on cognitive function and impairments in the latter contribute to the impairment of nutritional status[34]. Thus, the maintenance of cognitive function requires an adequate and healthy nutritional status and vice versa. Impairments of cognitive function, meanwhile, lead to the loss or reduction of autonomy and independence, causing a decline in the condition of life of the elderly that in turn encompasses nutritional state. Thus, cognitive stimulation should be a prioritized technique in the approach of health professionals with the elderly.

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Received: December 03, 2017
Reviewed: March 06, 2018
Accepted: May 16, 2018