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Original Article

Factors Affecting Cognitive Function in Older Adults: A Turkish Sample☆

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SUMMARY

Background: The purpose of this study was to determine the influential factors of cognitive function in older adults.
Methods: In this study, 377 older adults (mean age: 74.71 ± 6.15 years) were examined. The Hodkinson Abbreviated Mental Test (HAMT) was used to describe cognitive function of the individuals. The Centers for Disease Control (CDC) Health-Related Quality of Life (HRQOL-4) survey tool was used to measure the quality of life. Possible influential factors of cognitive function were also detected. The following independent variables were included in the logistic regression analysis: age, gender, education level, residency, smoking habit, musculoskeletal pain, medication use, number of unhealthy mental days, number of unhealthy physical days, and activity limitation days.
Results: The results indicated that the elderly with cognitive impairment showed low scores in terms of the three parameters of the CDC HRQOL-4. The findings also indicate that the following variables were found to significantly affect cognitive function: (1) age, (2) residency (rest home), (3) smoking (yes or quit), and (4) number of unhealthy mental days.
Conclusion: Older adults should be assessed in terms of factors related to cognition, such as age, residency, smoking, and mood in order to plan the most suitable geriatric care.

1. Introduction

As our population grows older, the issue of improving the quality of life (QOL) of the elderly will become increasingly important. It is now well accepted that cognitive impairment is one of the indicators of QOL for the elderly[1]. While living a long life is desirable, more focus needs to be placed on the QOL of older people. The aging process should imply not only a longer life, but also normal overall functioning as a means to a healthy life. The health-related QOL (HRQOL) refers to the personal sense of physical and mental health and the ability to react to factors in physical and social environments. Since the most significant point in the care of older people is to maintain or improve their QOL, it is important to know how various health complaints interfere in terms of low QOL[2].

Cognitive dysfunction is a common problem among elderly people. Population-based studies report that most community-dwelling elderly people suffer from cognitive problems. Advancing age is associated with an increase in health complications that can lead to disability. The elderly may suffer from illness, disabilities, and functional impairments that are related to cognitive problems, which make them dependent on others for care and help in their daily life[3–6]. The impact of cognitive problems on HRQOL has been assessed in various studies[1,7]. Cognitive problems lead to a profound negative impact on an individual's emotion and social well-being[8].

The purpose of this study was to determine the influential factors of cognitive function of the elderly living in Denizli Province, Turkey.

2. Materials and methods

This study is the second leg of the study in which 900 elderly people were studied for a new tool measuring (HRQOL)[2].

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2.1. Participants

Out of the 900 elderly people mentioned above, 377 were found to have the required criteria for inclusion to this study (the factors affecting cognitive function). Ninety-one people were living in a rest home, and 286 functionally independent older adults were living in their own homes in the community. All with a mean age of 74.71 ± 6.15 years (range; 65-94 yr.) were studied. The inclusion criteria were as follows: individuals who were 65+ years old, those who were not diagnosed with Alzheimer's disease, dementia, schizophrenia, Parkinson's, multiple sclerosis, those who had no cerebrovascular pathology, those who were not on continuous medication, and those who completed the Hodkinson Abbreviated Mental Test (HAMT) in full with no mistakes. All gave informed consent to participate in the study. This study was carried out in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki as revised in 2000. Table 1 shows the descriptive statistics of the older adults with or without cognitive impairment.

2.2. Study design

Ten trained final-year students (from Pamukkale University School of Physical Therapy and Rehabilitation in Denizli, Turkey) collected all the data using standardized instruments under the supervision of the authors. All the investigators were informed and trained about the purpose of this study, the use of the instruments, data collection, and interviews.

2.3. Outcome measures

2.3.1. Cognitive function

The HAMT was used to examine the cognitive function of older adults. The test consists of 10 questions, and it is a short and an easy test to examine the cognitive impairment in older adults. This test can be completed in approximately 3 minutes by the elderly. It includes components requiring intact short- and long-term memory, attention, and orientation. The score was collapsed into two levels in this study: 0–2 wrong answers indicated no cognitive impairment. and three or more wrong answers indicated cognitive impairment (Appendix 1)[9,10].

Table 1
Descriptive statistics (frequency, %) and mean ± standard deviation.

Independent variables	Category	No cognitive impairment ($n = 183$) mean ± SD	With cognitive impairment ($n = 194$) mean ± SD
Age (y)[a]		72.46 ± 5.47	76.84 ± 6.01
Number of unhealthy mental days[a]		13.82 ± 10.42	19.11 ± 10.52
Number of unhealthy physical days		15.39 ± 10.09	20.92 ± 10.33
Number of activity limitation days		16.31 ± 10.58	21.61 ± 9.42
		Frequency (%)	
Gender	Male	133 (72.7%)	79 (40.7%)
	Female	50 (27.3%)	115 (59.3%)
Education level	Illiterate	9 (4.9%)	99 (51.0%)
	Can read and write	20 (10.9%)	48 (24.7%)
	Primary school	93 (50.8%)	42 (21.6%)
	Middle school	29 (15.8%)	3 (1.5%)
	High school	21 (11.5%)	2 (1.0%)
	University	11 (6.0%)	—
Residency[a]	Rest home	19 (10.4%)	72 (37.1%)
	Own home	164 (89.6%)	122 (62.9%)
Smoking habit[a]	Yes	43 (23.5%)	24 (12.4%)
	Quit	69 (37.7%)	44 (22.7%)
	Never	71 (38.8%)	126 (64.9%)
Musculoskeletal pain	Yes/no	131 (71.6%)/52 (28.4%)	152 (78.4%)/42 (21.6%)
Medication use	Yes/no	82 (62.6%)/49 (37.4%)	113 (74.3%) /39(25.7%)

[a] Statistically significant.

2.3.2. Health-related quality of life (HRQOL)

The Centers for Disease Control (CDC) in the United States of America has developed a set of survey measures to assesso a person's sense of well-being through four questions (Appendix 2). The CDC HRQOL-4, which has studied its validity and reliability in previous studies,was selected as an outcome measure. Because it is easy to use in studies in older population[2,11]. The tool includes four questions. Question 1 focuses on self-rated health that has been found to be predictive of mortality. Questions 2 and 3 relate to recent physical and mental health symptoms, respectively. Question 4 provides a global measure of disability. While not designed to be aggregated into a summary score, Healthy Days Index (combining Questions 2 and 3) has been used to calculate the number of good healthy days (during the past 30 days) experienced by older adults. Each question of CDC HRQOL-4 was collapsed into different levels, corresponding to similar studies in previous literature that used this scale, and served as the independent variable. For example, self-rated health was collapsed into two levels: excellent-very good-good; fair-poor. The number of unhealthy physical days, unhealthy mental days, and activity limitation days were collapsed into three levels: 0 (zero), 1–13, and 14 or more days[2]. Question 1 was not included in this study's statistical analysis. The following scores of the three sub-parameters of this scale were considered:

Recent physical health.

For how many days during the past 30 days was your physical health not good?

Recent mental health.

For how many days during the past 30 days was your mental health not good?

Recent activity limitation.

During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

2.4. Statistical analysis

Descriptive statistics are given as frequency, percentage, and mean ± standard deviation. To determine the influential factors of cognitive function (HAMT Score), the binary logistic regression method was used. When the dependent variable is a categorical one (for example, two or more levels), logistic regression is used. When the dependent variable has two levels, it is called a binary (or Bernoulli) variable. The independent or predictor variables in logistic regression can take any form. In other words, the independent variables can be either a categorical or measurable property. The variables used in binary logistic regression analysis were as follows. The dependent variable is cognitive impairment and the independent variables are age, gender, education level, residency, smoking habit, musculoskeletal pain (last 3 months), medication, number of unhealthy mental days (last 1 month), and number of unhealthy physical days (last 1 month), and activity limitation days (last 1 month). To compare differences between the two independent groups (with no cognitive impairment and with cognitive impairment) for scores was obtained using the CDC HRQOL-4, the Mann-Whitney U test was used. Statistical significance was accepted as $p < 0.05$. The SPSS 10.0 package program was used for analysis.

3. Results

The descriptive statistics of the older adults are summarized in Table 1. The scores obtained using CDC HRQOL-4 are given in