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Original article

# Predicting cognitive impairment among geriatric patients at Asir central hospital, Saudi Arabia



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## ABSTRACT

**Background:** Cognitive impairment is an aging-related disease that can result in a variety of health problems as disability and death. Cognitive impairment was reported to be more than 40% among elderly individuals.

**Aim:** To predict cognitive impairment among geriatric patients at Asir central hospital, Saudi Arabia and its relationship to health status.

**Study design:** A descriptive correlational study design was used to conduct this study. The study included a convenient sample of all geriatric patients (130) attending outpatient clinics of Asir central hospital in Abha city from the first of February to the mid of March 2020. Three tools were utilized to collect data pertinent to this study; Tool (I): structured geriatric patient's sociodemographic and clinical data interview questionnaire, Tool II: Geriatric Depression Scale Short-Form (GDS-SF) and Tool III: Mini Mental State Examination (MMSE) Scale.

**Results:** The majority of the studied sample was in the age group between 60 and 69 years, and female, having a chronic disease, (31.6%) were having a mild cognitive impairment and (17%) were having severe cognitive impairment and there was an association between cognitive impairment levels and health status of the studied patients with no statistically significant difference.

**Conclusion:** Nearly one third were having a mild cognitive impairment and about one fifth were having severe cognitive impairment. There was a correlation between levels of cognitive impairment and health status of the studied patients.

**Recommendations:** Health education programs to increase the awareness of the Saudi community about cognitive impairment and its risk factors are needed. Elderly cognitive screening services must be readily available for early diagnosis and early treatment of cognitive impairment.

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## 1. Introduction

While age is the primary risk factor for cognitive impairment, other risk factors including family history, education level, brain

injury, exposure to pesticides or toxins, physical inactivity, and chronic conditions such as Parkinson's disease, heart disease, stroke, and diabetes may be associated. Individuals may reduce the risk of cognitive impairment by keeping physically active and maintaining healthy cholesterol and blood sugar levels (Legdeur et al., 2018).

Conditions such as heart problems and cancer, Alzheimer's disease develop over decades and are influenced by lifestyle. Therefore, factors such as cholesterol, high blood pressure, obesity, depression, education, nutrition, sleep, mental status, and physical as well as social activities affect cognitive functions (Booth et al., 2012).

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Dementia, a decline in cognitive function severe enough to affect social or occupational functioning, can be due to Alzheimer disease (AD), vascular dementia, frontotemporal dementia, dementia with Lewy bodies, Parkinson disease with dementia, dementia of mixed cause, or many rarer causes (Hugo and Ganguli, 2014).

Cognitive impairment is an important issue; nowadays, there is no cure for cognitive impairment caused by Alzheimer's disease or other related dementias. However, some causes of cognitive impairment are related to health issues that may be treatable, like medication side effects, vitamin B12 deficiency, and depression. This is why it is important to identify people who are showing signs of cognitive impairment to ensure that they are evaluated by a health care professional and receive appropriate care or treatment as early as possible. Any person fear losing cognitive function, 60% of adults are very or somewhat worried about memory loss; losing the mental capacity is worrisome as having diminished physical ability (Tripathi and Vibha, 2009; Leonard, 2018).

Cognitive impairment is not only highly prevalent but has a great impact on the quality of life, thus imposing a substantial socioeconomic burden. Cognitive impairment is now a significant public health concern all over the world, and identifying potential risk factors of cognitive impairment is fundamental for developing preventive strategies. People are less likely to seek treatment for psychiatric symptoms because of lack of access to care or due to stigma (Soleimani et al., 2018).

Culturally specific health education is needed in individuals, family members, and healthcare providers to improve awareness and knowledge of signs and early symptoms of Alzheimer's and other dementia. Earlier identification of cognitive impairment may reduce patient and caregiver morbidity (Sörensen and Conwell, 2011).

**Significance of the study:** Early identification of cognitive impairment can significantly produce health benefits and prevent devastating complications for the elderly and the family caregivers.

**Study aim:** to predict cognitive impairment among geriatric patients at Asir central hospital, Saudi Arabia and its relationship to health status.

## 2. Patients and method

**Study design:** a descriptive correlational study design was used to conduct this study.

**Patients and setting:** The study included a convenient sample of all geriatric patients (130) attending outpatient clinics of Asir central hospital in Abha city from the first of February to the mid of March 2020.

## 3. Tools

**Tool (I): structured geriatric patient's sociodemographic and clinical data interview questionnaire:** it was used to collect data such as age, sex, marital status, educational level, income, pre-retirement occupation, current work status, place of residence, and presence of chronic diseases.

**Tool II: Geriatric Depression Scale Short-Form (GDS-SF):** it is a 15-item self-report scale (Yesavage and Sheikh, 1983). The GDS-SF was translated into Arabic and proved to be valid and reliable ( $r = 0.70$ ) by "El husseini 2013". The geriatric patient chooses the best answer either yes (1) or no (0) for how he/she have felt over the past week. Items were summed for a total score. For ten questions, a positive answer indicates the presence of depression and negative answer for the remaining five questions (question number 1, 5, 7, 11 and 13) also indicates depression. Scores of the scale were categorized either as 0–4 indicates no depression, 5–8 indi-

cates mild depression, 9–11 indicates moderate depression, or 12–15 severe depression.

**Tool III: Mini Mental State Examination (MMSE) Scale:** (Folstein et al., 1975). The MMSE was translated into Arabic and approved to be valid and reliable by (Elhusseini, 2008). It was used for assessing cognitive function of the patients; memory, orientation to time, place, attention, calculation, naming, repetition, registration and language. The scale includes 30 questions with the response of either yes or no. Possible scores were categorized as 24–30 indicating intact cognitive function, scores from 18 to 23 indicates mild cognitive impairment, while 0–17 indicates severe cognitive impairment.

**Exclusion criteria:** patient with depression, delirium or head trauma within the past 3 months.

## 4. Ethical considerations

An informed written consent was obtained from patients included in this study after explanation of the study aim and nature. Privacy and anonymity of the participants was assured along with confidentiality of the collected data. Patients were assured of their right to withdraw from the study at any time. Ethical approval from King Khalid university committee and Asir central hospital committee were obtained before conducting this study.

## 5. Analysis of the data

The collected data entered and analyzed using SPSS (statistical package software version 23). Data were presented using descriptive statistics as frequencies and percentages, correlation analysis was done using Chi square test. Statistical significance was considered at  $P$ -value  $< 0.05$ .

## 6. Results

Table 1 illustrates the sociodemographic characteristics of the studied sample; regarding age (76.9%) were in the age group

**Table 1**  
Socio – demographic characteristics of the studied patients (n = 130).

Variables	Frequency N.	Percent %
Age		
60–69	100	76.9
70–79	21	16.1
80 and more	9	7.0
Sex		
Female	91	70.0
Male	39	30.0
Marital status		
Single	7	5.4
Married	81	62.3
Widow / widower	42	32.3
Level of education		
Illiterate	66	50.8
Basic education	47	36.2
High education	17	13.0
Occupational status before retirement		
Un-Employed	91	70.0
Employed	39	30.0
Income		
Enough	73	56.1
Not enough	57	43.9
Living status		
With a family member	125	96.1
Alone	5	3.9

between 60 and 69 years, (70%) were female, (62.3%) were married and (32.3%) were widow or widower, (50.8%) were illiterate and (36.2%) were having basic education, regarding occupation before retirement (70%) of them were unemployed, (56.1%) of them were having enough income and (96.1%) were living with a family member.

Fig. 1 reveals distribution of the studied patients regarding their health status; (70%) were having a chronic disease.

Fig. 2 presents the distribution of the studied patients regarding levels of cognitive impairment; (51.4%) were intact cognitively, (31.6%) were having a mild cognitive impairment and (17%) were having severe cognitive impairment. Table 2 illustrates the correlation between levels of cognitive impairment and socio-demographic characteristics of the studied patients; there was an association between cognitive impairment and sociodemographic characteristics with a statistically significant difference.

Table 3 presents the correlation between levels of cognitive impairment and health status of the studied patients; it reveals an association between cognitive impairment levels and health status of the studied patients with no statistically significant difference.

## 7. Discussion

Cognitive impairment nowadays represents a major public health concern in developing countries especially Arab countries due to its high prevalence, its impact on quality of life and its substantial socioeconomic burden (Yaffe et al., 2011). In this respect this study was conducted to predict cognitive impairment among geriatric patients at Asir central hospital, Saudi Arabia and its relationship to health status which is fundamental for developing preventive strategies.

The results of the current study revealed that the majority of the studied sample were in the age group between 60 and 69 years, female, married, a little more than half were illiterate and unemployed before retirement. More than half of them were having enough income and nearly all were living with a family member.

Also the highest percentage were having a chronic disease, regarding levels of cognitive impairment; a little more than half of them were intact cognitively, nearly one third were having a mild cognitive impairment and nearly one fifth were having severe cognitive impairment. From the researchers point of view this might be related to the presence of multiple chronic conditions

and the high rate of illiteracy among the studied sample which put them at higher risk of developing cognitive impairment.

The present study result comes in agreement with (Alkhunizan et al., 2018) in the study conducted in Saudi Arabia which reported mild cognitive impairment in 38.6% of the studied sample. Chuan-Jun et al (Chuan-Jun et al., 2012) contradicts this result when they reported that the average annual incidence rate of mild cognitive impairment was 2.17% among older adults in a five-year follow-up study in Beijing.

This study revealed that the prevalence of CI was higher with advanced age with a statistically significant relationship between advanced age and level of cognitive impairment. This result comes in concordance with Sigurdsson et al. 2012 who reported that with increasing age, the brain tissue begins to shrink, and physiological function gradually declines. Also Rahman and El Gaafary, 2009 reported that older age is the independent risk factor for MCI among apparently healthy elderly subjects.

This study also found that older women were higher in the level of cognitive impairment than men with a statistically significant difference between sex and level of cognitive impairment among the studied sample. In the same line (Ren et al., 2018) concluded that the prevalence of cognitive impairment was 19% among men and 39% among women in their studied sample. In disagreement with these results (Nebel et al., 2018) reported that there was no difference in the prevalence rates of CI between men and women.

There was a statistically significant difference between marital status and level of cognitive impairment among the studied older adults as it was found that solitary elders had higher risk of cognitive impairment than those who are married. This may be due to solitary older individuals often have less opportunity to communicate and are less involved in social activities. These findings were supported by Zijun et al. (2012) who reported that unmarried people had two times the risk of developing cognitive impairment when compared to those who are married. Contradictory to these results Bae et al., 2015 reported that marital status has no association with the prevalence of CI as unmarried elders (single, widowed, or divorced) may have a different lifestyle when compared to those of married people.

The current study results denoted that level of cognitive impairment is significantly higher in illiterate than educated elders with a statistically significant difference. These findings may be related to that education is a good dynamic tool which help in improving memory, cognitive stimulation and cognitive performance. This finding comes in agreement with (Casemiro et al., 2018) who

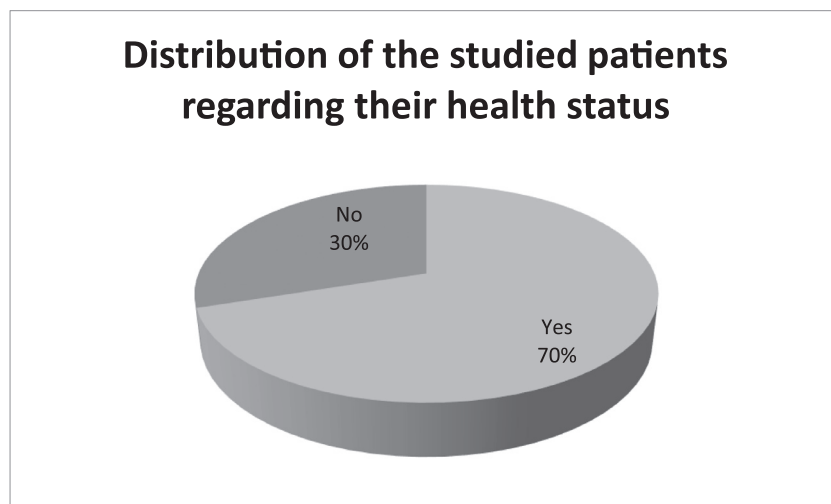


Fig. 1. Distribution of the studied patients regarding their health status.

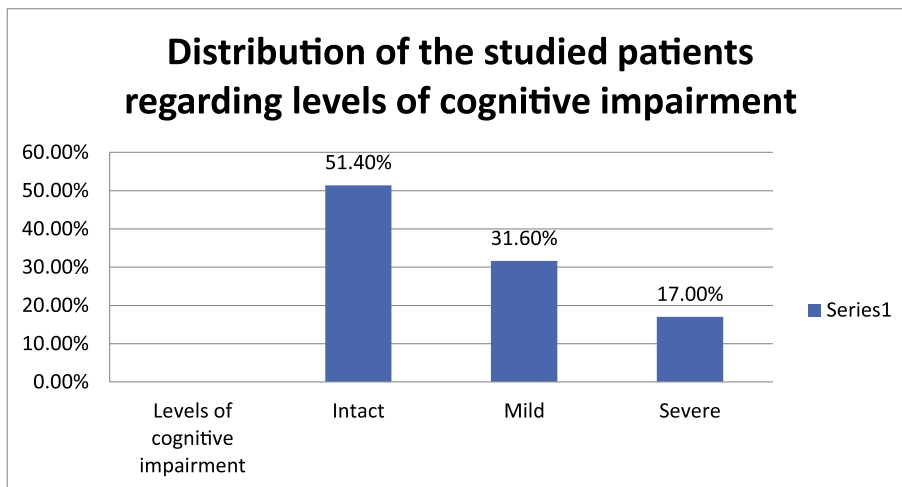


Fig. 2. Distribution of the studied patients regarding levels of cognitive impairment.

Table 2

Correlation between levels of cognitive impairment and socio-demographic characteristics of the studied patients (n = 130).

Socio-demographic Characteristics of the studied patients	Levels of cognitive impairment of the studied patients				$\chi^2$	P. value
	Intact	Mild	Severe	Total		
<b>Age</b>						
60–69	54	30	16	100	24.139	0.05
70–79	4	9	8	21		
80–90	1	3	5	9		
<b>Sex</b>						
Female	36	33	22	91	17.047 <sup>a</sup>	0.05
Male	29	8	2	39		
<b>Marital status</b>						
Married	21	31	29	81	24.159	0.05
Widow	28	9	5	42		
Single	4	2	1	7		
<b>Level of education</b>						
Illiterate	17	27	22	66	43.324 <sup>a</sup>	0.05
Basic Education	34	2	11	47		
High Education	14	2	1	17		
<b>Occupation</b>						
Un-Employed	35	34	22	91	15.962 <sup>a</sup>	0.05
Employed	28	8	3	39		
<b>Income</b>						
Enough	45	21	7	73	16.127 <sup>a</sup>	0.05
Not enough	19	20	18	57		
<b>Social support</b>						
With Family	60	43	22	125	25.298	0.05
Alone	1	1	3	5		

Table 3

Correlation between levels of cognitive impairment and health status of studied patients.

Health status	Levels of cognitive impairment			
	Intact	Mild	Severe	Total
<b>Presence of chronic diseases</b>				
Yes	44	31	17	92
No	23	10	5	38
$\chi^2 = 2.402^a$	df = 2	P = 0.301		

$\chi^2$  = chi square p > 0.05.

reported that low level of education was correlated with the risk of developing cognitive impairment.

Also it was found that older adults who do not have enough income were more cognitively impaired than older adults who had enough income, with a statistically significant relationship between income and level of cognitive impairment. It might be related that the lower income was associated with worse nutritional intake which affect the cognitive function, less access to healthcare services or less social activity and less interpersonal communication. This result was supported by (Ren et al., 2018) who found that lower cognitive functioning was strongly significantly associated with lower income.

This study found that there is a positive association between the presence of chronic illnesses and cognitive impairment with no statistically significant difference. In the same line with this result Alkhenizan et al, 2018 reported that chronic diseases as hypertension, diabetes mellitus, and cardiovascular diseases are risk factors for cognitive impairment. Contradictory to this result Al-Modeer

et al. (2013) concluded that there was an association between chronic illnesses and cognitive impairment with a statistically significant relation.

## 8. Conclusion

A little more than half of the studied sample was intact cognitively, nearly one third were having a mild cognitive impairment and nearly one fifth were having severe cognitive impairment. There was a correlation between levels of cognitive impairment and health status of the studied patients with no statistically significant difference.

## 9. Recommendations

Health education programs to increase the awareness of the Saudi community about cognitive impairment and its risk factors are needed.

Elderly Cognitive screening services must be readily available for early diagnosis and early treatment of cognitive impairment.

## 10. Source of Funding

None.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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