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Assessment of knowledge of Alzheimer's disease among medical students at Umm Al-Qura University, Saudi Arabia

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ABSTRACT

Background: Alzheimer's disease (AD) is rising health problem with an estimated 6.4% in Saudi Arabia. 80% of dementia cases are caused by AD and usually patients diagnosed at late stages. This study intends to measure the knowledge of Umm Al-Qura University (UQU) undergraduate medical students regarding AD. *Methods:* Cross-sectional study carried out using an online questionnaire disrupted among medical students. The questionnaire included two sections the first is about demographic data, the second assesses the knowledge related to AD and consisted of 30 true and false items. *Results:* The total sample number in this study was 332 (54.8% male, while 45.2% were female). The total mean score for this study was 14.12 and most of them (59%) had poor knowledge level regarding AD. *Conclusion:* This study shows the level of knowledge toward Alzheimer's disease is insufficient amongst medical students at UQU. Meanwhile, a higher academic year is linked to a better level of knowledge. Therefore, focused directed teaching is important to benefit students to develop their knowledge that allows them to do appropriate clinical evaluation by history and physical examination to reach the diagnosis.

Keywords: Alzheimer's disease, knowledge, medical students, dementia.

1. INTRODUCTION

Alzheimer's disease (AD) is known to be a progressive neurodegenerative disorder and it's considered the major cause of dementia responsible for 80% of all dementia cases (Weller & Budson, 2018). Moreover, Alzheimer's disease is the fifth leading cause of mortality among Americans aged sixty-five and above (Serrano-Pozo & Growdon, 2019). The degree of cognitive impairment in AD patients varies and depends on the concentration of amyloid and tau protein depositions in the brain (Breijyeh & Karaman, 2020; Gross et al., 2016). The manifestation characterized by gradually progressive cognitive and functional deficits including memory, comprehension, language, attention,

reasoning and judgment. As well as behavioral changes and eventually a decrease in the ability to do the simplest tasks (Ballard et al., 2011; Breijyeh & Karaman, 2020; Studart Neto & Nitrini, 2016). Alzheimer's disease is a rising health problem, with an estimated 6.4% in Saudi Arabia (al Arifi, 2020) and it has been linked with many risks' factors that contribute to the development and progression of disease such as aging, genetic defects, infections, vascular diseases and environmental factors (Alhumaidi et al., 2020; Breijyeh & Karaman, 2020). AD is most prevalent in individuals aged 60 years and most cases of Alzheimer's disease are sporadic. Additionally, the chance of developing AD after the age of 65 doubles every five years (Baral et al., 2020). Hence, accurate diagnosis and effective management are required to enable patients and their care givers to achieve optimal management of AD and to lower healthcare costs (Shadid et al., 2020). However, no single test or imaging modality can give an accurate diagnosis; this requires appropriate clinical evaluation by history and physical examination to reach the diagnosis in early stages (Atri, 2019).

Previous studies from different countries evaluated the knowledge regarding AD among college students and appeared to be below moderate (Baral et al., 2020). However, a study in Riyadh city revealed that the knowledge regarding Alzheimer's was varied among healthcare students with medical students having the highest knowledge level (al Arifi, 2020). Raising the knowledge of medical students is critical to improving the quality of life of people diagnosed with AD. Therefore, the goal of this study is to measure the knowledge of Alzheimer's disease amongst medical students at Umm Al-Qura University (UQU), Makkah, Saudi Arabia.

2. MATERIALS AND METHODS

This is a cross-sectional descriptive study quantitative method aimed to assessing the knowledge of Alzheimer's disease using Alzheimer's disease knowledge score (ADKS). The inclusion criteria were all medical students from the second year to the sixth year at UQU. The study was performed from July to September 2022, after the biomedical ethics committee obtained ethical approval at UQU. The sample size was calculated by epi info software VER 2.1, considering 5% margin of error and confidence interval as 95% is 331. Data was collected by a self-administered online questionnaire on Google form and informed consent was obtained from all participants after they opened the link.

The questionnaire contains two separate sections, the first section covers demographic data such as age, gender, year of study and questions cover if the participant has studied neurology or attended a neurology course. The second section assesses the knowledge related to Alzheimer's disease using ADKS questionnaire, which contain 30 true and false items with the resulting score being the numbers answered correctly with max score of 30 and considering level of knowledge to be good if the participant had answered ≥80% of items correctly, whereas 79%-50% correct answer was considered fair level of knowledge and <50% correct answer was considered poor knowledge level (Idris et al., 2020). The validity and reliability of the ADKS was measured by literature review (Carpenter et al., 2009).

Data was analyzed by SPSS version 27. Numbers, percentages, means and standard deviations were used to present the data Chi-Square test was used to measure the association between variables and considering confidence interval as 95% and level of significance p-value as < 0.05.

3. RESULTS

A total of 345 participants filed the questionnaire. 13 participants were excluded as they were in seventh academic year and the final sample number is 332. All responders 100% (n= 332) agreed to be part of the study, more than half of participants were male, 54.8% (n=182), while 45.2% (n=150) were female. Almost two thirds of the participants 66% (n= 219) were aged between (21-24) years, 28.9% (n= 96) were between 18-20 years and 5.1% (n= 17) older than 24 years. Most participants were in the third academic year, 23.5% (n= 78) while only 14.5% (n= 48) were in the second academic year. Most participants, 68.4% (n=227) answered yes and said they studied neurology or attended a neurology course (Table 1).

Table 1 Demo graphic characteristics.

Variable	Category	N.	%
Age groups	18-20	96	28.9%
	21-24	219	66%
	Older than 24	17	5.1%
Gender	Male	182	54.8%
	Female	150	45.2%
Academicyear	2^{nd} year	48	14.5%

	3rd year	78	23.5%
	4thyear	70	21.1%
	5thyear	65	19.6%
	6thyear	71	21.4%
Study neurology	Yes	227	68.4%
	No	21	6.3%

Most of the students had a poor knowledge level regarding Alzheimer's disease 59% (n=197), while only 16% (N=52) had a good knowledge level and 25%(N=83) had a fair knowledge level (Figure 1). Almost two thirds of the responders, 64.8% (n= 215), know that Alzheimer's disease is a type of dementia, 47.3% (n= 157) of them agreed that 30 years old person can develop Alzheimer's disease, two-thirds of them 67.2% (N= 223) knew that Alzheimer disease cannot be cured, while 44.3% (n= 147) do not know that after Alzheimer symptoms appear the average expectancy life is 6-12 years and most of them think AD patient will need 24 hours supervision 57.8% (n= 192) (Table 2).

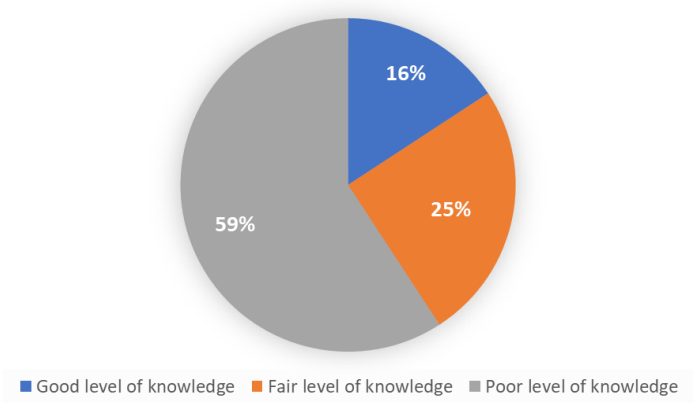

Figure 1 Students knowledge regarding Alzheimer's disease

Table 2 knowledge of Alzheimer's disease (n=332)

Item	Correct answer	% (n)
1. It is safe for patients with Alzheimer's disease (AD) to drive.	False	51.8(172)
2. Genes are partially involved in the development of AD.	True	45.8(152)
3. Tremor is a common symptom in patients with AD.	False	43.4(144)
4. AD cannot be cured.	True	67.2(233)
5. People with AD do best with simple tasks.	True	58.7(195)
6. If memory trouble appears suddenly, it is likely due to AD.	False	48.5(161)
7. People could recover from Alzheimer's disease.	False	35.8(119)
8. Reminder notes can contribute todisease decline.	False	29.5 (98)
9. Eventually, ADpatients will need 24-hr care.	True	57.8(192)
10.Drugs that prevent AD are available.	False	41.9(139)
11. Most people with AD live in nursing homes.	False	41.9(139)
12. AD is one type of dementia.	True	64.8(215)
13. When AD patients repeat the same question, it is helpful to remind them that they are repeating themselves.	False	44.9(149)
14.Most people with AD remember recent events better than the past event.	False	54.5(181)
15.A 30-year-old person can develop Alzheimer's disease.	True	47.3(157)
16. Mental exercise can prevent a person from developing Alzheimer's disease.	False	27.7 (92)
17. People whose AD is Not severe can benefit from psychotherapy for depression and anxiety.	True	52.4(174)

18.Believing that other people are stealing one's things is a symptom of AD.	True	47.0(156)
19. People with AD are more likely to have depression.	True	62.7(208)
20.The average life expectancy of Ad person is 6–12 years.	True	40.4(134)
21. Symptoms of severe depression can be mistaken for symptoms of AD.	True	43.4(144)
22. When AD patient becomes agitated at night, a good method is to let him get lots of physical activity during the day.	True	53.6(178)
23. People with AD, are not eligible to make informed consent.	False	31.3(104)
24. A person with AD becomes increasingly likely to fall as the disease decline	True	59.6(198)
25. When a person with AD becomes agitated and alert, a medical investigation could show other health issues.	True	49.7(165)
26. Having high blood pressure increases the risk of developing AD.	True	41.9(139)
27. Having high cholesterol increases the risk of developing AD.	True	40.1(133)
28. Trouble with money management is a common early symptom of AD.	True	50.9(169)
29. Malnutrition can make the symptoms of AD get worse.	True	53.9(179)
30.When a person with AD has difficulty looking after himself, caregivers should take care of him.	False	24.7(82)

A total of 332 students from the second to the sixth year were involved in the study. The total mean score was 14.12, while the mean score was 9.18 for second year students, 10.78 for third-year students, 12.52 for fourth-year students and 15.53 for fifth-year students, while the highest score was 21.43 for sixth year students. The study found a relation between knowledge level and gender, with females scoring a mean of 15.70, while for males it was 12.83. In addition to these findings, students who have studied or attended neurology courses scored higher than those who haven't had, the mean scores are 16.44, 9.11, respectively (Table 3).

Table 3 Association between students' levels of knowledge and Demographic characteristics.

Variable	Mean score (SD)	P-value
Gender		
Male	12.83 ± 6.82	<.001
Female	15.70 ± 8.25	.300
Academicyear		
2^{nd}year	9.18± 5.18	<.001
3^{rd} year	10.78 ± 6.43	<.001
4^{th}year	12.52 ± 5.7	<.001
5^{th}year	15.53 ± 6.46	.504
6^{th}year	21.43 ± 7.28	<.001
study neurology		
Yes	16.44 ± 7.48	.004
No	9.11 ± 5.09	<.001

4. DISCUSSION

The study intended to evaluate the knowledge toward Alzheimer's disease amongst medical students at UQU, 332 students were included in this study the average score was 14.12 and most of students (59%) had poor knowledge regarding Alzheimer's disease. In comparison, a similar study carried out on seven undergraduate colleges at Pokhara University of Kathmandu in Nepal found a slightly higher level of knowledge with a mean score of 15.45 using the same ADKS questionnaire (Baral et al., 2020).

In our study, 64.1% of the students knew Alzheimer's disease is one type of dementia and this finding is similar to the Nepal study where 65.65% of students knew Alzheimer's disease is a type of dementia. Surprisingly, 67.2% of the students in our study knew that AD can't be cured, while in the Nepal study only 40.37% of the participants answered this item correctly (Baral et al.,

2020). In our study, females had better knowledge regarding AD than males with mean scores of (15.70 ± 8.25, 12.52 ± 6.82) respectively. However, no relation was detected by Baral et al., (2020) between the knowledge level and gender.

In our study, clinical year's students (fourth to sixth academic year) had higher scores compared to pre-clinical students (second and third academic year). A similar result was found in two studies conducted in Riyadh, Saudi Arabia and the United States (US). The correct answer rate in the US study was 83.75% for final year students and 50.25% for first year students (Nagle et al., 2013), whereas 33.33% of final year students scored above 50% while only 10.73% of the first-year students scored above 50% in the Saudi study (Shadid et al., 2020), this might be due to high clinical exposure in final year while the first year mainly focused on basic science.Different study conducted to estimate the knowledge regarding Alzheimer's disease amongst health specialties students in Riyadh found that there is variation in knowledge level regarding AD between different colleges of studying with medical students achieving the highest mean score 8.12 ± 2.86 and p-value 0.005 (al Arifi, 2020). Another study conducted on general population of Makkah; Saudi Arabia revealed a moderate level of knowledge. However, the study revealed that having a relative with AD was not associated with an increased knowledge level regarding AD (Alhumaidi et al., 2020).

This study recommends that medical students should have access to online courses and clinical exercises to enhance their knowledge and empower them to make the right decisions based on the optimal evidence available. Moreover, Alzheimer's disease should be included in the curriculum of pre-clinical years in order to increase their knowledge toward the disease. The limitations of this study included a self-administered online questionnaire which might be possible for some misclassification. Furthermore, larger study among students at different medical colleges would give more significant results.

5. CONCLUSION

This study shows that the level of knowledge regarding Alzheimer's disease is insufficient amongst medical students at UQU. Meanwhile, a higher academic year is linked to a better level of knowledge. Therefore, intensive and focused teaching is required to enhance students' knowledge and empower them to make the right decisions based on the optimal evidenceavailable.

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Consent for participation

Informed consent was obtained from all participations.

Ethical approval

The study was approved by the Medical Ethics Committee of Umm Al-Qura University ethical approval no. HAPO-02-K-012-2022-08-115

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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