

Perception and attitude of the general population toward Alzheimer's disease in eastern region, Saudi Arabia

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ABSTRACT

Objectives: To measure the awareness of AD among the general population of Eastern Province, Saudi Arabia. **Methods:** A cross-sectional study was conducted in the Eastern Province of Saudi Arabia from October to November 2023. The data was collected using an online questionnaire. **Results:** A total of 614 eligible participants completed the study questionnaire. Among those surveyed, 99.3% had heard about Alzheimer's disease (AD), while 96.1% associated it with memory loss. Additionally, 91.5% recognized that individuals with AD face risks when driving, 91.5% believed they could not independently handle their financial matters, 85.7% thought they could not make health-related decisions on their own, and 85.5% believed they could still participate in sports. **Conclusion:** The research results challenge our initial hypothesis by revealing significant AD awareness in Eastern Province, Saudi Arabia, largely attributed to internet-based health information. Despite this, there is a need to improve public attitudes toward Alzheimer's patients, highlighting the importance of enhanced education and better communication between healthcare professionals and the public.

Keywords: Alzheimer's disease, awareness, dementia, knowledge, neurodegenerative disease, practice

Introduction

Alzheimer's disease (AD) is the most common form of dementia, accounting for approximately 60–80% of all cases. Alzheimer's disease is widely acknowledged as the leading global cause of dementia, alongside other significant contributors like frontotemporal dementia, vascular disorders, and dementia with Lewy bodies. It currently affects around 50 million people worldwide.^[1,2] Alzheimer's disease is a progressive neurodegenerative condition that worsens over time, impairing basic functions and causing significant emotional distress.^[3,4] It affects daily activities like feeding and

toileting, impacting patients and their families while also posing a substantial economic burden, estimated at around US\$1 trillion globally.^[5] There are two primary forms of Alzheimer's disease: early-onset, affecting individuals in their 40s to 50s, and late-onset, affecting those over 65 years old. In Saudi Arabia, approximately 130,000 people are estimated to have AD, with global numbers expected to double by 2050.^[6] Aging is the primary risk factor for AD, alongside genetic predisposition, cardiovascular conditions, smoking, obesity, and traumatic brain injury.^[7] Preclinical Alzheimer's brain changes precede moderate cognitive impairment symptoms by years. Autopsy remains the definitive diagnostic method for AD, revealing current diagnostic challenges and the absence of precise diagnostic technologies.^[8,9] Additionally, the population's age distribution is progressively shifting toward an older demographic.^[10] It is crucial for primary care providers to prioritize enhancing awareness of AD among patients and caregivers alike.

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A study conducted in China found that older participants and females exhibited a higher level of retention of AD information compared to the younger male population.^[11] Conversely, research conducted in Nepal showed that there was no noteworthy correlation between gender and the extent of knowledge concerning AD.^[12] Amado study^[13] found higher education and younger age are linked to better awareness and understanding of AD diagnosis, management, and therapy. They also highlighted a persistent lack of awareness among family members and caregivers of dementia patients. Several studies in Saudi Arabia highlight varying levels of awareness regarding Alzheimer's disease (AD). Alorfi study^[14] found acceptable knowledge levels among participants, contrasting with findings from Aseer, where 60% believed memory loss and other symptoms were normal in older individuals, and 34.9% attributed AD to evil forces or black magic.^[15] Previous studies have highlighted a lack of Alzheimer's disease (AD) knowledge in Jeddah, possibly due to insufficient educational resources online and on Arabic television, and the absence of awareness campaigns.^[7] Conversely, research in Mecca showed a wide range in AD knowledge levels^[16] underscoring varied public understanding. This knowledge gap may contribute to confusion between normal aging and pathological changes in AD patients,^[1,17] potentially delaying early treatment. Understanding public attitudes and awareness of AD could facilitate earlier diagnosis, treatment initiation, and supportive care, potentially reducing caregiver stress and hospitalization rates.^[18]

AD represents the predominant form of dementia globally, yet awareness and understanding among the public, particularly in Saudi Arabia's Eastern Province, remain underexplored.^[19] This study aims to assess public knowledge of AD in the Eastern Province of Saudi Arabia, focusing on understanding factual knowledge, clinical features, factors influencing awareness, and assessing attitudes toward the disease.

Additionally, highlighting its relevance for improving early diagnosis and care practices among practitioners, thereby enhancing patient outcomes and reducing caregiver burden.

Plan/Study Methodology

A cross-sectional study was conducted in the Eastern Province of Saudi Arabia from October 18 to November 4, 2023. The sample size was 614 participants, which was calculated based on the assumption of a $50\% \pm 5\%$ awareness level with a 95% confidence level. The study population included males and females in the Eastern Province of Saudi Arabia and those with and without family members with AD. Individuals who were more than 60 or under 16 years of age, non-Saudi, or outside the Eastern Province were excluded from the study. The data was collected using an online questionnaire, which was distributed on different social media platforms such as WhatsApp and Telegram. The questionnaire consists of demographic data, general information, clinical features, treatment, and attitude toward AD accompanied by the participants' information sources.

The awareness level was assessed using a 15-item Arabic-language questionnaire adapted from a previous study.^[7] Data analysis was conducted using SPSS version 21, employing two-tailed statistical tests with an alpha level of 0.05 for significance ($p \leq 0.05$). Overall awareness scores were categorized as poor ($<60\%$) or good ($\geq 60\%$).

Descriptive statistics included frequency distributions and percentages for demographic variables and AD-related factors, with awareness, perception, and attitude summarized in tables and awareness levels graphically represented. Cross-tabulation to show factors associated with study participants' awareness of AD was carried out with Pearson's Chi-square test for significance and an exact probability test if there were small frequency distributions. Ethical approval was received from King Faisal University (KFU-REC-2023-OCT-ETHICS1304).

Results

A total of 614 eligible participants completed the study questionnaire. Participants' ages ranged from 18 to 60 years, with a mean age of 26.7 ± 12.9 years. A total of 338 (55%) participants were females. As for education level, 220 (35.8%) had a secondary education, 341 (55.5%) were university graduates, and 35 (5.7%) had a postgraduate degree. A total of 300 (48.9%) were single, and 295 (48%) were married. Monthly income less than 5,000 SR was reported by 328 (53.4%) participants, 96 (15.6%) had monthly income ranging between 5,000 and 10,000 SR, while 74 (12.1%) had monthly income exceeding 20,000 SR. A family history of AD was reported by 197 (32.1%) participants [Table 1].

Table 2 shows the participants' awareness of AD, Eastern Province, Saudi Arabia. Generally, 99.3% of the study participants had heard of AD, 96.1% thought AD causes memory loss, 91.5% knew that persons with AD cannot drive a car without any risk, 91.5% thought that persons with AD cannot act by themselves in their financial matters, 85.7% thought that persons with AD cannot decide by themselves in health matters, and 85.5% thought that persons with AD can play sports. Also, 80.3% of the study participants thought that persons with AD are prone to fall as the disease progresses, 79.2% thought that the mental abilities of persons with AD are not like others, while 40.2% thought persons with AD do not need psychotherapy. Regarding the disease age, 83.7% of the study respondents reported old age. As for causes of AD, most of the study participants (61.6%) said it is a brain disease. Considering treatment, only 38.1% knew about medications, while 46.7% thought there was no treatment for AD.

Figure 1 shows the participants' overall awareness of AD in Eastern Region, Saudi Arabia. Exactly 495 (80.6%) of the study participants had a good overall awareness of AD, while only 119 (19.4%) had a poor awareness level.

Figure 2 depicts the source of information about AD in Eastern Region, Saudi Arabia. The most reported sources of information

were internet websites (50%), family and friends (34.7%), personal experience (29.2%), school/university (25.9%), and TV (19.2%). Only 11.6% reported physicians as their main source of information about the disease.

Table 3 shows the attitude and perception of the general population toward AD in Eastern Region, Saudi Arabia. Exactly 92.2% thought that people with AD should be given simple,

Table 1: Demographic data of study participants, eastern province, Saudi Arabia

Demographic data	No	%
Age in years		
18–20	160	26.1%
21–30	196	31.9%
31–40	67	10.9%
41–50	103	16.8%
51–60	88	14.3%
Gender		
Male	276	45.0%
Female	338	55.0%
Educational level		
Below secondary	18	2.9%
Secondary education	220	35.8%
University graduate	341	55.5%
Post-graduate degree	35	5.7%
Marital status		
Single	300	48.9%
Married	295	48.0%
Divorced/widow	19	3.1%
Monthly income		
<5000 SR	328	53.4%
5000–10000 SR	96	15.6%
10000–15000 SR	57	9.3%
15000–20000 SR	59	9.6%
>20000 SR	74	12.1%
Family history of Alzheimer's disease?		
Yes	197	32.1%
No	417	67.9%

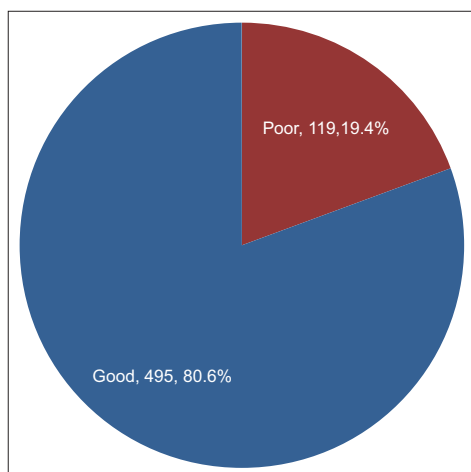


Figure 1: Overall participants' awareness about Alzheimer's disease in eastern region, Saudi Arabia

easy-to-understand instructions, 86.8% of the study participants thought that AD causes great psychological and social stress, 83.2% thought people with Alzheimer's need to be monitored all day, 47.7% thought people with AD are a burden on the family, and 31.4% reported that it would be better to alert people with AD that they are repeating the same question. However, 86.5% possible to go to a public place with people with AD, 95.3% did not think that people with AD should be isolated from society, 84.9% did not think that society views AD as a stigma, and 88.3% disagreed that people with AD should be admitted to a nursing home.

A total of 87.5% of participants aged 50–60 years had a good overall awareness of AD *versus* 71.3% of others aged 18–20 years with recorded statistical significance ($p=0.009$). Also, 88.6% of those with postgraduate degrees had a good overall awareness compared to 74.5% of others with a secondary level of education ($P=0.035$). Good awareness of AD was detected among 85.5% of married participants *versus* 73.7% of others who were divorced ($P=0.008$). Likewise, 85.3% of participants with a family history of AD had a good overall awareness of the disease in comparison to 78.4% of others ($P=0.045$). The highest awareness was detected among participants who gained their information from physicians (87.3%) *versus* 74.1% of those who reported from other sources ($P=0.037$).

Discussion

This study investigated the awareness of and attitude toward AD among the residents of the Eastern Province of Saudi Arabia. The mean age of participants in the study was approximately 26.7 years old, with an age range of 12.9 years. The participants' overall awareness was excellent, with only 1 out of 5 having what is considered to be poor awareness. In general, 96.1% study's participants believed that AD is associated with memory loss. Interestingly, 40.2% believed psychotherapy was unnecessary for individuals with AD. Regarding treatment, 46.7% thought there was no treatment available, though only 38.1% knew about existing medications. Internet websites were the primary source of information for 50% of participants, similar to findings

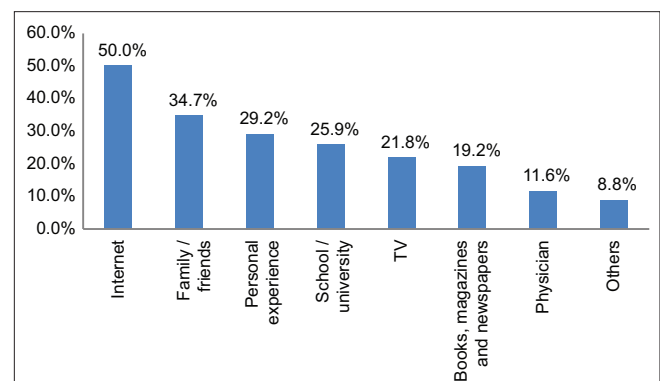


Figure 2: Source of information about Alzheimer's disease in eastern region, Saudi Arabia

Table 2: Participants' awareness about Alzheimer's disease eastern province, Saudi Arabia

Awareness items	Yes	No	%
General Awareness			
Have you heard of Alzheimer's disease before?	Yes	610	99.3%
Do you think Alzheimer's disease causes memory loss?	Yes	590	96.1%
Do you think Alzheimer's disease causes hand tremors?	No	341	55.5%
Do you think that the lifespan of persons with Alzheimer's disease is like others?	Yes	407	66.3%
Can persons with Alzheimer's disease drive the car without any risk?	No	562	91.5%
Do you think that persons with Alzheimer's disease can play sports?	Yes	525	85.5%
Do you think that persons with Alzheimer's disease can decide by themselves in health matters?	No	526	85.7%
Do you think that persons with Alzheimer's disease can act by themselves in their financial matters?	No	562	91.5%
Do you think that persons with Alzheimer's disease can shop and buy by themselves?	No	416	67.8%
Do you think that persons with Alzheimer's disease are prone to fall when the disease progresses?	Yes	493	80.3%
Do you think that persons with Alzheimer's disease remember events that are nearby and not distant?	No	429	69.9%
Do you think that the mental abilities of persons with Alzheimer's disease are like others?	No	486	79.2%
Do you think that persons with Alzheimer's disease have depression and anxiety?	Yes	410	66.8%
Do you think that persons with Alzheimer's disease think that society will steal from them or harm them?	Yes	310	50.5%
Do you think persons with Alzheimer's disease need psychotherapy?	No	247	40.2%
What do you think is the specific age for developing Alzheimer's disease?	Old age	514	83.7%
	Young age	4	0.7%
	Any age	77	12.5%
	Dont know	19	3.1%
Causes of Alzheimer's disease?	Dont know	43	7.0%
	Brain disease	378	61.6%
	Psychological disease	99	16.1%
	Normal part of aging	356	58.0%
	Genetic disease	192	31.3%
	Head trauma	124	20.2%
	Madness	9	1.5%
	Mental retardation	28	4.6%
	Evil eye or magic	20	3.3%
	Punishment from God	20	3.3%
Treatment method of Alzheimer's disease?	Dont know	143	23.3%
	With medications	234	38.1%
	Electric shock	10	1.6%
	Surgery	15	2.4%
	Herbal therapy	16	2.6%
	With recitation of Quran	87	14.2%
	With yoga and meditation	26	4.2%
	Traditional cauterization	1	0.2%
	There is no treatment	287	46.7%
	Others	26	4.2%

Table 3: Attitude and perception of the general population towards Alzheimer's disease in eastern region, Saudi Arabia

Attitude/perception items	Yes		No	
	No	%	No	%
If you have Alzheimer's disease, do you hide the fact that a family member has Alzheimer's disease?	74	13.6%	472	86.4%
Do you think that Alzheimer's disease causes great psychological and social stress?	533	86.8%	81	13.2%
Do you think people with Alzheimer's disease are a burden on the family?	293	47.7%	321	52.3%
Do you think society views people with Alzheimer's disease as a stigma?	93	15.1%	521	84.9%
Do you think people with Alzheimer's disease should be isolated from society?	29	4.7%	585	95.3%
Is it possible to go to a public place with people with Alzheimer's disease?	531	86.5%	83	13.5%
Do you think it would be better to alert people with Alzheimer's disease that they are repeating the same question?	193	31.4%	421	68.6%
Do you think people with Alzheimer's disease should be given simple, easy-to-understand instructions?	566	92.2%	48	7.8%
Do you think that using notes and modern equipment makes the situation worse?	136	22.1%	478	77.9%
Do you know how to deal with people with Alzheimer's disease?	185	30.1%	429	69.9%
Do you think people with Alzheimer's need to be monitored all day?	511	83.2%	103	16.8%
Do you think people with Alzheimer's disease should be admitted to a nursing home?	72	11.7%	542	88.3%

from Jazan Province.^[19] Reflecting on this finding, primary care physicians should endorse credible online resources about AD to ensure accurate patient education. Contrary to many studies' hypotheses, the results of the data analysis showed that the majority of the participants in the Eastern Province (80.6%) had a good awareness of AD, setting aside the claim that the Saudi population cannot be regarded as appropriately knowledgeable.^[4] This is evident in several aspects of our results, such as 99.3% awareness of the disease, compared to 89.0% in Jeddah.^[7]

In our study, 96.1% of participants were aware of Alzheimer's and its association with memory loss. Additionally, 85.7% understood AD's impact on decision-making abilities in health matters, a higher awareness compared to a study in Jazan, which reported 49.8%.^[19] Furthermore, our study shows higher awareness compared to previous research.^[3,4,7] However, only 55.5% of participants correctly understood that tremors are not a symptom of AD.

The study suggests that participants who linked AD with memory loss were less likely to associate AD with hand tremors, similar to findings in the Gaugler study.^[9]

Participants who associated AD with memory loss were also more likely to perceive depression and anxiety among individuals with AD. Similarly, those who believed that Alzheimer's patients require psychotherapy tended to think that these patients fear societal harm, echoing findings from the Aseer study.^[15] These correlations underscore how participants' beliefs about AD symptoms and the needs of AD patients are interconnected. The study's findings align with the hypothesis, revealing varied attitudes and perceptions toward AD. A minority (13.6%) of participants expressed a reluctance to disclose an AD diagnosis to their families, suggesting potential feelings of shame or discomfort. Primary care physicians should prioritize creating a supportive environment for open discussion of AD diagnoses to reduce stigma and enhance access to support services. A majority (86.8%) recognized that AD causes significant psychological and social stress, contrasting with a lower awareness reported in the Jeddah study,^[7] indicating a heightened understanding of the disease's impact. A significant portion (92.2%) of respondents believed that people with AD should be given simple, easy-to-understand instructions, indicating a preference for clear communication methods. Only 4.7% of respondents believed in isolating people with AD from society, contrasting sharply with the 47.1% reported in the Jazan study,^[19] highlighting a significant divergence in attitudes toward AD isolation. The data underscores the internet's significant role as a primary information source on AD, reflecting a growing trend in using online resources for education on this condition, consistent with findings from the Jeddah study.^[7] The study provided valuable insights into the general population's awareness and attitudes toward AD, challenging assumptions of widespread knowledge gaps. However, it also revealed specific areas where understanding was lacking; for example, only 55.5% of participants recognized that tremors are not associated with

AD. Identifying these gaps can inform educational efforts to improve understanding in these areas. This information is crucial for healthcare professionals, policymakers, and organizations working in Alzheimer's care and advocacy. Moreover, it will help in tailoring education and awareness campaigns, improving support systems for caregivers, and addressing misconceptions associated with the disease. Additionally, it highlights the importance of accurate online information dissemination and the need for healthcare providers to engage with patients and the general public effectively.

Limitations are reflected in the study. The results show what percentage of participants hold certain beliefs or perceptions, but they do not provide insights into the depth or nuance of these beliefs. For example, while 96.1% believe AD causes memory loss, we do not know to what extent they understand the nature and progression of memory loss in Alzheimer's. Also, the results are quantitative and based on closed-ended questions. They do not capture the qualitative aspects of participants' beliefs, such as the reasons behind their beliefs or the emotional aspects related to these beliefs.

Thus, while the results provide valuable insights into the beliefs and attitudes of the study participants regarding AD, they do not offer a complete understanding of the complex factors that influence these beliefs and their practical implications. Further qualitative investigation and longitudinal studies may be necessary to delve deeper into AD.

Conclusion

The research findings reveal substantial public awareness of AD in Saudi Arabia's Eastern Province, largely influenced by widespread internet health information dissemination. However, attitudes toward Alzheimer's patients require enhancement, underscoring the necessity for expanded educational efforts and improved healthcare communication.

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Conflicts of interest

There are no conflicts of interest.

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