

Assessment of Knowledge towards Alzheimer's Disease among the Community Pharmacists of North Karnataka: A Survey Based Cross-Sectional Observational Study

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ABSTRACT

Background: Alzheimer's disease is a leading cause of dementia in the world which is characterized by progressive cognitive decline. The increasing number of cases of Alzheimer's disease has increased the necessity of healthcare professionals trained in management of Alzheimer's disease. It has also become necessary to include community pharmacist into AD management team as they can counsel the patients and family members, ensure medication adherence, lookout for drug related problems etc., which in turn improves the quality of care provided to patients. For this reason, it has become necessary to assess the level of knowledge and thus provide relevant training to the community pharmacist regarding Alzheimer's disease. The current cross-sectional observational study was carried out with the aim of assessing the level of knowledge towards Alzheimer's disease among the community pharmacists of North Karnataka.

Materials and Methods: The study was conducted with the help of a questionnaire which was circulated via Google forms and consists of two sections namely the demographic details of the participants and questions from the validated ADKS (Alzheimer's disease Knowledge Scale) scale. Microsoft Excel spreadsheet was used for analysis of the data. **Results:** The mean ADKS score of the 100 community pharmacists who participated in the study was found to be 15.03 ± 3.66 SD. The difference in mean ADKS score was more prominent among participants with different educational qualification degrees, between different age groups and also between participants from urban and rural settings. **Conclusion:** The knowledge of community pharmacists can be improved by conducting training sessions, seminars, and workshops regarding AD at regular time intervals.

Keywords: Alzheimer's disease, ADKS Scale, Community Pharmacist, Knowledge.

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INTRODUCTION

Alzheimer's Disease (AD) is one of the most common types of dementia.¹ It is a neurodegenerative disease that is characterized by progressive cognitive decline, which typically starts with a decrease in the capacity to form recent memories but inevitably affects all intellectual functions which in the end leads to complete dependence of the patient on others for basic life activities and finally to an early death.^{2,3}

The etiology of Alzheimer's disease is unknown. However, several risk factors associated with Alzheimer's disease are known.⁴

Some of the risk factors associated with Alzheimer's disease are smoking, hypertension, diabetes, and high cholesterol which are modifiable risk factors while age, family history and genetics are non-modifiable risk factors.² The pathogenesis of Alzheimer's disease is characterized by amyloid β deposits which form senile plaque and phosphorylated tau protein deposits which form neurofibrillary tangles in the hippocampus region of the brain.⁵

The symptoms of AD vary based on the stage of the disease. The person in the early stage of the disease may be able to function on their own. He or she may continue to engage in social events, work, and drive. Despite this, the individual could experience memory lapses, such as forgetting familiar words or where everyday objects are located. The middle stage lasts for a longer duration. The patient will require a greater level of attention as the disease progresses. In this stage, the patient will still be capable of remembering important details of their life but they



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struggle more to conduct daily activities of life such as paying bills etc. The difficulty in performing daily tasks and difficulty in conveying or communicating their thoughts is due to the fact that there is damage to the nerves in the brain. In the final stage of the disease, the symptoms become increasingly severe. In this stage, the patients cannot carry out conversations, lose their capability to respond to their surroundings and also lose their ability to control and co-ordinate their body movements. Deterioration in memory and cognitive functions as well as changes in personality is observed in the patients. Patients in this stage need a lot of assistance in their day-to-day tasks.^{2,6} The USA is said to have a higher prevalence of Alzheimer's disease when compared to Africa, Asia and Europe. Although lower incidence rates in Asia might be due to the fact that fewer incidence studies are carried out in this region.²

In India, more than 4 million individuals are suffering from dementia.⁷ Although the number of cases of Alzheimer's disease is much less in India when compared to Western countries, The Alzheimer's and Related Society of India (ARDSI) Dementia Report 2010 states that with the increase in the population of older people, the incidences of AD will also increase.⁸ Also, rapidly changing lifestyles can also contribute to the increased risk of developing AD. With the increase in cases of AD, India might face difficulty in battling the disease because the Indian healthcare professionals have a lesser background information about AD. It has been shown that increased knowledge about AD among healthcare professionals will help in better counseling of the patients and their family members.⁹ Although doctors, nurses and caregivers can help in counseling the patients as well as the family members, the involvement of pharmacists has a much more impact because a pharmacist especially a community pharmacist acts as a communication link between the doctor and the public. By including a pharmacist in the team, they will not only help in counselling the AD patients but will also guide the patient in adhering to their medication therapies, suggest alternative therapies, and look for drug-related problems thus improving the quality of care provided to the patient. A thorough knowledge of AD is required in order for a pharmacist to carry out effective counselling. In order to impart such knowledge through training programs so that the community pharmacist becomes an integral part of the AD management team, it is necessary to know how much they know about the disease and what are areas in which they lack knowledge. So, the current study was conducted with the aim of assessing the knowledge about Alzheimer's disease of the community pharmacist of the north region of Karnataka, India.

MATERIALS AND METHODS

The current study was a cross-sectional observational and an online-based knowledge survey using the ADKS scale which was conducted among the community pharmacists in the northern region of Karnataka.

Study tools

A questionnaire was designed which was based on the standard ADKS scale to carry out the current survey and it was compiled in the English language. The questionnaire consisted of two sections. The first section comprised the demographic details of the participants which included Age, Gender, Residence, Place, Year of Experience, Education and Occupation. The second section of the questionnaire consists of questions used to assess the knowledge level of the community pharmacists. The ADKS scale i.e., Alzheimer's Disease Knowledge Scale, is a validated scale and is used to assess the level of knowledge about Alzheimer's disease. The scale has 30 True/False questions and comprises seven domains: Assessment and Diagnosis, Risk Factors, Course of Disease, Treatment and Management, Caregiving, Life Impact, and Symptoms. The Assessment and Diagnosis domain has 4 questions, the Risk Factors domain has 6 questions, the Course of Disease domain has 4 questions, the Treatment and Management domain has 4 questions, the Caregiving domain has 5 questions, the Life impact domain has 3 questions and Symptoms domain has 4 questions. Each of the questions can either be true or false.

Study population

The population for the current study included the community pharmacists from the north part of Karnataka.

Data collection

In order to make data collection feasible, Google forms were created using the standard ADKS questionnaire. The questionnaire was circulated through an online platform. The link to the survey was circulated among the contacts of the community pharmacists and the responses were collected. In demographic details, the first and second questions were mandatory and were directed toward the participant consent. While filling out the questionnaire the participants were instructed to attempt all mandatory questions. When all of the questions were answered, the participants were notified of the completion on the same online platform. The data collected was directly imported to an Excel spreadsheet so that it could be analyzed easily.

Data analysis

The data obtained from the survey was analyzed with the help of Microsoft Excel Worksheet. In order to make analysis easy, the data collected from Google Forms were directly imported into an Excel sheet. For each question, the participants were able to choose either an option of true or false. Some of the questions in

the ADKS scale had true as answers while some had false. In order to obtain the score for the correct answers of each pharmacist, the answers were coded in an Excel sheet for each question. For a correct answer, a value of '1' was coded while for a wrong answer, a value of '0' was coded. This was followed by a calculation of the mean ADKS score of the community pharmacists. The percentage as well as standard deviation was also calculated. The mean ADKS score as well as the percentage of correct answers for each of the demographic variables was also calculated and evaluated.

RESULTS

Demographic details

A total of 100 participants responded to our survey all of whom were community pharmacists from different parts of North Karnataka. Among them, the number of male participants was 77 and was in the majority while the number of female participants was 23. About 68 (68%) participants belonged to the age group of 21-30, 18 (18%) belonged to the age group of 31-40, 6 (6%) belonged to the age group of 41-50 while the rest of 8 (8%) belonged to the age group of 51-60. The highest number of participants i.e., 46 (46%) of them were having a degree in Diploma in Pharmacy, 40 (40%) of participants had a degree in Bachelor of Pharmacy, 11 (11%) of them had completed Master in Pharmacy while 3 (3%) were having a Doctorate of Pharmacy degree. About 100 of those who participated in the study, 69 (69%) of them were from urban setting and 31 (31%) were from rural setting. 43 (43%) number

of the participants were employed, 27 (27%) were self-employed and 30 (30%) were unemployed. Table 1 shows the demographic distribution of the participants.

Difference in Mean ADKS score

The mean ADKS score of the pharmacists was found to be 15.03 ± 3.66 (50.1%). The major difference in mean ADKS score was found among the participants having different education degrees. The highest score was obtained by the participants who had the degree of Doctorate in Pharmacy which was 16.63 ± 1.15 (68.8%). The next highest score was obtained by the participants having a degree in Masters (16.6 ± 2.90). This was followed by the score of participants having a degree in Bachelors (15.3 ± 3.01) and participants having a degree in Diploma had the lowest score (13.7 ± 3.5). Another major difference in the mean ADKS score was found among the participants from different residences. Community pharmacists from urban setting had scored highest (15.5 ± 3.68) when compared to pharmacists from rural setting (13.8 ± 3.34). When the mean ADKS score between participants from different age groups was compared, it was found that the age group 51-60 had scored the highest (17.6 ± 1.68) while the age group of 31-40 had scored 14.4 ± 3.94 . The 21-30 age group had scored 15.1 ± 3.9 and the 41-50 age group had scored 17.3 ± 4.92 . The mean ADKS score of employed community pharmacists was higher (15.4 ± 3.64) when compared to self-employed community pharmacists (14.9 ± 3.88). However, there was not much difference in the mean ADKS score between male participants (14.7 ± 3.5) and female participants (15.8 ± 3.82). Table 2 shows the difference in the mean ADKS score between different demographic variables.

Table 1: Demographic distribution of participants.

Demographic distribution of the participants	Number of participants N (%)
Gender	
Male	77 (77%)
Female	23 (23%)
Age	
21-30	68 (68%)
31-40	18 (18%)
41-50	6 (%)
51-60	8 (%)
Residence	
Urban	69 (69%)
Rural	31 (31%)
Qualification	
D. Pharm	46 (46%)
B. Pharm	40 (40%)
M. Pharm	11 (11%)
Pharm D	3 (3%)
Occupation	
Employed	43 (43%)
Self-employed	27 (27%)
Un-employed	30 (30%)

Difference in Mean ADKS score of different domains

Table 3 demonstrates a comparison between the mean ADKS scores of different domains. When the mean ADKS score of the participants was compared between different domains, it was observed that the highest percentage of correct answers were obtained in the Life Impact domain with 63.3% of correct answers. The lowest percentage of correct answers was obtained in Caregiving domain with 42.2% of correct answers. The participants scored 56.25% in the Assessment and Diagnosis domain, 49% in the Course of disease domain, 48.48% in the Symptoms domain, 44.5% in the Risk Factors domain and 43.25% in the Treatment and Management domain.

DISCUSSION

The current study was conducted with the objective of assessing the knowledge about Alzheimer's disease among the community pharmacists. The participants from our study had scored an average of 15.03 i.e., 50% of correct responses.

Jenna Stearns *et al.*, conducted a comparison study in Ohio to assess the knowledge about Alzheimer's disease between community pharmacists in an 'urban' and 'rural' setting. The

Table 2: Difference in mean ADKS score of participants between different demographic variables.

Variables	Mean scores \pm SD	Percentage
Gender		
Male	14.7 \pm 3.5	49.26%
Female	15.8 \pm 3.82	52.89%
Age		
21-30	15.1 \pm 3.9	50.4%
31-40	14.4 \pm 3.94	48.1%
41-50	17.3 \pm 4.92	57.7%
51-60	17.6 \pm 1.68	58.7%
Residence		
Rural	13.8 \pm 3.34	46.02%
Urban	15.5 \pm 3.68	51.9%
Qualification		
B. Pharm	15.3 \pm 3.01	51.0%
D. Pharm	13.7 \pm 3.5	45.9%
M. Pharm	16.6 \pm 2.90	55.4%
Pharm D	16.63 \pm 1.15	68.8%
Occupation		
Employed	15.4 \pm 3.64	51.5%
Self-employed	14.9 \pm 3.88	49.8%
Unemployed	14.6 \pm 3.51	48.6%

Table 3: Comparison of mean ADKS score of the participants between different domains.

Domains	Mean ADKS score \pm SD (%)
Assessment and diagnosis	2.25 \pm 1.10 (56.25%)
Risk factors	2.67 \pm 1.01(44.5%)
Course of disease	1.96 \pm 1.004 (49%)
Treatment and management	1.73 \pm 0.98 (43.25%)
Caregiving	2.11 \pm 0.97 (42.2%)
Life Impact	1.91 \pm 0.766 (63.33%)
Symptoms	1.93 \pm 1.03 (48.48%)

average score of the participants in this study was found to be 25.6 which was much higher when compared to the score of the participants from our study. The community pharmacists from Ohio who belonged to the older age group scored much higher when compared to other age groups which was similar to the results obtained from our study. The participants from our study who had the doctorate degree had a highest mean ADKS score but it was found that the mean ADKS score of the Ohio pharmacists was not affected by the qualification degree. The results from a study conducted among Ohio pharmacists showed that the participants belonging to the rural setting had scored higher when compared to the participants from the urban setting

which completely contrasted with the results obtained from our study where the participants from the urban setting had scored much higher.¹⁰

Another similar study was conducted in Malaysia among public hospitals and health clinic pharmacists where the participants had a mean ADKS score of 19.05 which was higher compared to the score of the participants from our study. The participants from our study who had a doctorate degree had the highest mean ADKS score whereas the results of the study conducted among Malaysia pharmacists showed that the ADKS score was not affected by the qualification degree. In the comparison of the mean ADKS score between different domains, the Malaysian pharmacists had scored highest in the Caregiving domain which was completely different from the results obtained from our study where the participants had scored least in the Caregiving domain. This might be due to the fact that community pharmacists are not much involved in the 24-hr supervision of AD patients as much as the hospital pharmacists are involved in supervision along with the caregivers especially while monitoring medication adherence.¹¹

Monica Alacreu *et al.* conducted a study among community pharmacists and general practitioners in Spain to assess the knowledge about risk factors of Alzheimer's disease. The participants of this study had scored highest in the Treatment and Management domain which contrasted with the results obtained from our study where the participants had scored comparatively lower in the Treatment and Management domain.¹²

A study was conducted among the Maltese community pharmacists to assess their knowledge about Alzheimer's disease where the results of the study showed that the participants of the younger age group had a higher mean ADKS score which contrasted with the results obtained from our study because the participants of our study who belonged to older age group had a highest mean ADKS score. In the comparison of the mean ADKS score between different domains, the results of our study showed that the participants had scored less in the Treatment and Management domain, whereas the community pharmacists of Malta had scored higher in the Treatment and Management domain.¹³

Overall, the results of our study showed that a large difference in mean ADKS score was found within the participants of different age groups with 51-60 participants scoring the highest while there was not much difference in the scores between male and female participants. The community pharmacists with different educational degrees also showed a huge difference in scores with the pharmacists with doctorate degree scoring the highest. Community pharmacists scored least in the Caregiving domain and scored highest in the Life Impact domain.

CONCLUSION

The results from the study conclude that the community pharmacists from the North Karnataka region had limited knowledge about Alzheimer's disease because the score of the pharmacists in our study was much lower when compared to the score of the pharmacists in other studies. Although the lack of knowledge about this disease may be due to that fact of lower incidence of the disease in this region, the changing trends of the current lifestyle are contributing to increase the risk of developing Alzheimer's disease. If not prepared, a rise in cases of Alzheimer's disease may not only impact the mental health of society but also impact the economy of the country since the treatment and management of patients with AD can be a monetary challenge. Hence it becomes very important to train community pharmacists so that they can help in educating people about the risk factors of the disease which will be helpful in reducing the number of incidences, of the symptoms which will help the patients or their family members to recognize the condition and go for an early treatment etc. The community pharmacists in an AD management team will also reduce the burden of the caregivers by ensuring medication adherence of the patients, checking for drug-related problems, suggesting alternative therapies etc. The knowledge of community pharmacists can be improved by conducting training sessions, seminars, and workshops regarding AD at regular time intervals. Including relevant information in the study curriculum of the pharmacy students will also help in improving knowledge regarding the disease.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

AD: Alzheimer's Disease; **ADKS:** Alzheimer's disease; **SD:** Standard Deviation.

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