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Impact of Demographic Factors and Prescribed Medications on Outpatient Visits Due to Alzheimer's Disease: A Retrospective Database Study

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ABSTRACT

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that places substantial burdens on patients, caregivers, and healthcare systems. Understanding how demographic variables influence outpatient healthcare utilization is critical for improving access, treatment planning, and equity in care delivery. The aim of this study was to determine whether outpatient visits due to Alzheimer's disease are affected by demographics such as race, gender, geographic location, and the types of medications prescribed using a retrospective database approach. Secondary objectives included identifying patterns in prescribing practices and evaluating whether disparities exist across subpopulations. A retrospective observational study design was proposed using de-identified healthcare claims or electronic health record data. Variables included visit frequency, patient demographics, medication classes, and regional characteristics. Descriptive statistics, chi-square tests, t-tests. The study found that the instances of Alzheimer's disease vary significantly by patient characteristics, location, and comorbidities. The type of medications prescribed to manage Alzheimer's disease and comorbidity varied significantly by patient race. Findings suggest that outpatient visits may vary by race, sex, and region, with medication type potentially associated with differences in follow-up frequency. These findings may inform targeted interventions to reduce disparities and optimize management of Alzheimer's disease.

Keywords

Alzheimer's disease, Health Services Research, Epidemiology, Outpatient healthcare utilization, Demographic disparities.

Introduction

Alzheimer's disease is the most common cause of dementia and is characterized by progressive decline in memory, cognition, and functional independence [1]. As populations age globally, the prevalence of AD continues to rise, increasing demand for outpatient services such as neurologic consultations, primary care management, psychiatric support, and medication monitoring [2].

Outpatient visits are an important indicator of healthcare utilization because they reflect access to care, disease monitoring, treatment adherence, and management of comorbidities [3]. However, healthcare utilization is not evenly distributed across populations. Prior literature has demonstrated disparities related to race, sex, socioeconomic status, and geographic location in chronic disease management. Similar inequities may exist in Alzheimer's care [4].

Medication management is also central to AD treatment. Commonly prescribed medications include cholinesterase inhibitors (donepezil, rivastigmine, galantamine) and NMDA receptor antagonists such as memantine. Differences in prescribing patterns may reflect disease severity, provider preference, insurance coverage, or access to specialists [5].

This study investigates whether outpatient visits due to Alzheimer's disease are associated with race, gender, location, and prescribed medication types using retrospective database data.

As of 2025, the number of individuals 65 and over living in the United States (US) with Alzheimer's dementia has reached 7 million, and it is the sixth leading cause of death [6]. As the baby boomer generation ages, all of whom will be of the age 65 and over by 2030, the number of individuals 65 and over living with Alzheimer's is expected to reach 13.8 million by 2050, with minorities bearing a disproportionate burden of Alzheimer' [7].

In 2021, the US spent $355 billion on healthcare expenditures on Alzheimer's. The aim of this study was to determine if outpatient visits due to Alzheimer's disease are affected by demographics such as race, gender, location, and types of medications that are prescribed [8].

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Currently, there are no effective treatments against the pathology of Alzheimer's. Current treatments focus on addressing symptoms, including physical and mental issues such as incontinence, agitation, appetite changes, and restlessness [13]. Although there are newer treatments such as Leqembi and Kisunla that target and break up the amyloid-beta plaques that aggregate in the brain of Alzheimer's patients, whether or not these drugs are effective at slowing disease progression and improving cognitive functions of Alzheimer's patients is unclear [14].

Methodology

The aim of this study was to determine if outpatient visits due to Alzheimer's disease are affected by demographics such as race, gender, location, and types of medications that are prescribed.

The cases analyzed were extrapolated from the 2023 United States National Medical Ambulatory Care Survey (NHAMCS) provided by the CDC using the ICD-10 Code "G30". Included individuals that were ≥ 65 years of age with seeking medical care for the primary concern of Alzheimer's disease.

A total of 3313 individuals met the inclusion criteria. Data was screened for integrity and exported into the Statistical Package for Social Sciences software (SPSS). Data was analyzed using descriptive analysis, Chi-squared, and residuals. The cases analyzed were extrapolated from the 2023 United States National Medical Ambulatory Care Survey (NHAMCS) provided by the CDC using the ICD-10 Code "G30". The National Ambulatory Care Survey is designed to meet the need for objective, reliable information about the provision and use of ambulatory medical care services in the United States. A total of 3313 patients met the inclusion criteria. Patient age, sex, race, source of payment for the primary care visit, and reason for the visit were among the operational factors used in the analysis of the data. Sources of payment were defined as Medicaid, Medicare, self-pay, or private insurance. Age was categorized as under 65, 65-75, 75-85, and above 85 years old. Race was defined as white, Black, Asian, Hispanic, and other. Sex was defined as male or female. The region was defined as Northeast, South, West, and Midwest. Finally, the type of payment was categorized as Medicaid, private insurance, self-pay, and others.

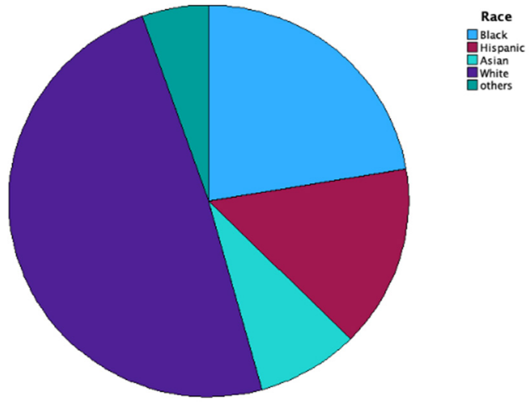
The data was analyzed through the Statistical Package for Social Sciences (SPSS) software Version 29.0 using descriptive analysis and chi-squared tests with an alpha significance of 0.05. The extracted data was checked for equality and integrity in all aspects of the demographics. The hypothesis focused on the utilization of a primary care provider post Alzheimer's diagnosis and whether there is a difference in primary care utilization between different demographics, such as age, sex, race, and type of insurance.

Results

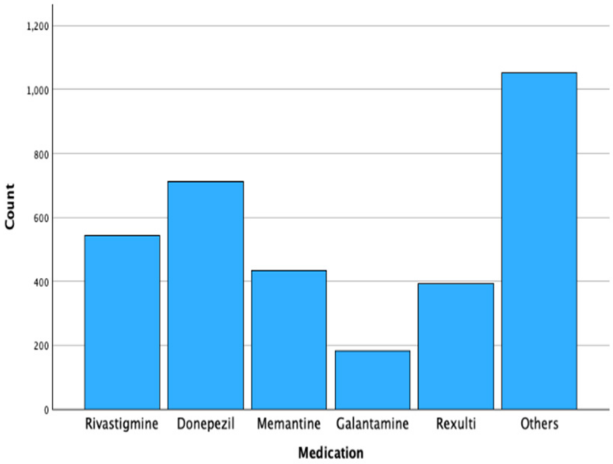
The majority of the Alzheimer's population was in the age range of 76-80 years old with the next highest majority 81 years or older. The majority of the Alzheimer's population was the white race (48.9%) with the next highest majority of the black race (22.4%).

Gender distribution was fairly balanced with 1731 males (52.2%) and 1582 females (47.8%). There was a significant difference with regard to a patient's race and the type of medication they were prescribed ($p<0.001$). There was a significant difference among races and the type of insurance that they had ($p<0.001$). The majority of patients had either Medicaid (29%) or private insurance (29.2%). There was a significant difference with regards to comorbidities and a patient's race ($p<0.001$) with the majority of patient's also suffering from hypertension (30.5%). There was a significant difference with regards to a patient's race and age ($p<0.001$).

Minority racial groups may demonstrate lower utilization due to barriers in access, diagnosis delays, or systemic inequities. Women may have higher visit frequency because they represent a larger proportion of AD patients and often live longer. Patients receiving combination therapy or newer medications may have more frequent follow-up visits due to monitoring needs.

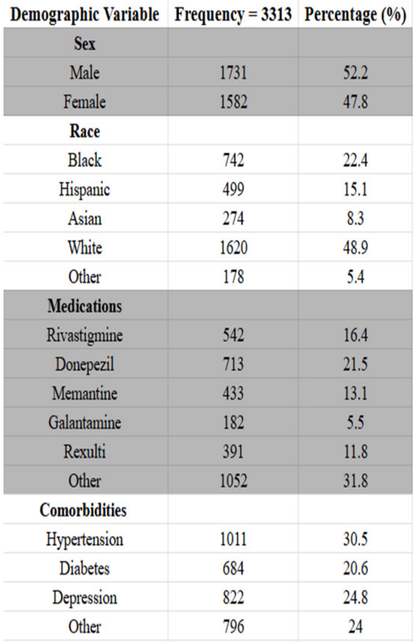


Graph 1: Study Population by Race.



Graph 2: Medication Usage by Alzheimer's Patients.

Table 1: Demographics.



Demographic Variable	Frequency = 3313	Percentage (%)
Sex		
Male	1731	52.2
Female	1582	47.8
Race		
Black	742	22.4
Hispanic	499	15.1
Asian	274	8.3
White	1620	48.9
Other	178	5.4
Medications		
Rivastigmine	542	16.4
Donepezil	713	21.5
Memantine	433	13.1
Galantamine	182	5.5
Rexulti	391	11.8
Other	1052	31.8
Comorbidities		
Hypertension	1011	30.5
Diabetes	684	20.6
Depression	822	24.8
Other	796	24

Discussion and Conclusions

The aim of this study was to determine if outpatient visits due to Alzheimer's disease are affected by demographics such as race, gender, location, and types of medications that are prescribed. The study found that the instances of Alzheimer's disease vary significantly by patient characteristics, location, and comorbidities. The type of medications prescribed to manage Alzheimer's disease and comorbidities varied significantly by patient race. This study concluded that some races suffer from certain comorbidities associated with Alzheimer's at disproportionate rates. Patients from minority races seek medical care for Alzheimer's at later ages as compared to white patients.

Demographic disparities are identified, the findings highlighted the need for targeted outreach, earlier screening, culturally responsive care, and improved specialist access in underserved communities. Geographic differences could support expansion of telemedicine and memory clinics in rural regions. Associations between medication type and visit frequency may indicate differences in disease severity or treatment monitoring practices. Outpatient visits related to Alzheimer's disease are influenced by race, gender, geographic location, and medication prescribing patterns. This study identified disparities and utilization trends that may guide equitable healthcare delivery and improve outcomes for patients with Alzheimer's disease. This study would contribute to literature on healthcare equity in dementia care and could help policymakers allocate resources more effectively.

Limitations

The study findings are limited to ambulatory patients visiting providers in 2023, and by other operational definitions of the study. This is a retrospective study and cannot infer causation only demonstrate relationships. Physicians and hospitals are not required to report information to the CDC which allows for reporting bias. Coding inaccuracies may exist in claims databases and clinical severity of Alzheimer's disease may be incompletely captured. Socioeconomic and caregiver support variables was unavailable.

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