Evaluation of Adherence to Prescribed Medications Among Older Adults with Cognitive Impairment

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Abstract

Medication adherence is a significant difficulty in treating elderly patients, yet they are underrepresented in studies. The researchers conducted a systematic study targeting older patients to evaluate the factors contributing to non-adherence in this demographic. The research examined several electronic databases for research detailing the causes of medication non-adherence among individuals aged 75 and older. The findings were not confined to illnesses, medical settings, or geographical regions. The quality of qualifying studies was evaluated using the Newcastle-Ottawa Index. A narrative review of the results was conducted. Twenty-five publications were considered, all situated in community settings. Regular medication evaluations and understanding the rationale behind the medicine were favorably correlated with compliance. Factors linked to inadequate adherence included multimorbidity, cognitive decline, intricate regimens involving several prescribing doctors, and issues related to medication storage or composition. The results indicate that treatments to enhance adherence should concentrate on medication reviews designed to simplify regimes and educate patients on their medical care. Populations exhibiting insufficient compliance that might get the most out of such a paradigm include those with numerous illnesses and cognitive impairments.

Keywords: Prescribed Medications, Older Adults, Cognitive Impairment, Health

1 INTRODUCTION

Medication adherence, defined as the consumption of prescription pharmaceuticals at the correct dosages and intervals as directed, has shown efficacy in enhancing wellness and diminishing healthcare expenditures Baryakova et al. (2023). A recent Cochrane analysis determined that improving the effectiveness of adherence programs might significantly influence public health more than advancements in particular medical therapies Stewart, Moon, & Horne (2023). Failure to adhere, manifesting as non-initiation and non-persistence, is intricately associated with treatment effectiveness and progression of the disease, as well as improper up-titration, leading to increased risk of conflicts and adverse medication responses. Adherence is a significant issue among older people, since the incidence of characteristics linked to poor compliance, such as multimorbidity and increased regimen difficulty, escalates with age Kvarnström et al. (2021). Various factors at the levels of drugs, patient, healthcare provider, and institutions elucidate non-adherence in seniors, including: (a) heightened susceptibility to drug-related issues due to chemical and pharmacokinetic alterations; (b) significant incidence of comorbidities resulting in polypharmacy and functional decline; (c) a higher probability

of drug interactions associated with a greater medication load; and (d) raised service utilization across diverse settings, resulting in multiple healthcare providers and regimen complexities. These issues never arise in isolation and serve as both the root cause and consequence of non-adherence, resulting in a cycle of increasing hardship. Research directly addressing this elder demographic is little portrayed, and existing studies often concentrate on a singular condition Bao et al. (2025). The research sought to determine the characteristics possibly linked to compliance by systematically evaluating research focused on individuals over 75 years old, facilitating data integration across various illnesses and healthcare environments.

2 METHODS

2.1 Study Cohort and Methodology

The research performed a prospective cohort investigation involving 3069 subjects from the Ginkgo Evaluation of Memory Studying (GEMS), a randomized, double-blind, placebo-controlled investigation conducted between 2010 and 2020 to assess the relationship between Ginkgo biloba and dementia prevention in older adults. The trial found no overall correlation between G. biloba and Alzheimer's Disease (AD) Eisenmenger et al. (2023); however, the study serves as an exceptional resource for examining the relationship between alcohol consumption and the resulting risk of dementia due to its substantial commitment to identifying hidden neurocognitive modifications. Volunteers were chosen from four academic medical institutions. The study participants were 70 years of age or older at the beginning. They completed cognitive and functioning evaluations for unexpected dementia throughout an average follow-up of 6.0 years (interquartile range: 4.8-6.2 years). The entry requirements for GEMS excluded people deemed incapable of completing the experiment by the research personnel, such as those with a documented history of excessive drug use (Fig. 1).

The preliminary trial took place under the provisions of the Declaration of Helsinki Vetrici et al. (2021). The institutional oversight boards of all four academic medical facilities sanctioned this investigation, and patients furnished signed informed consent. Data analysis was conducted from 2020 to June 2024. This research adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting criteria Ghaferi, Schwartz, & Pawlik (2021).

2.2 Cognitive Evaluations and Identification of New-Onset Dementia

Each participant completed a thorough neuropsychological assessment of 10 tests during the research screening. From 2010 to 2020, the Revised Mini-Mental Status Evaluation (3MSE) and the Clinical Alzheimer ratings were conducted biannually until the conclusion of follow-up, death, or the identification of dementia, whichever transpired first (Fig. 1). Until 2020, the dementia Assessment Scale cognitive section (ADAS-Cog) was conducted biannually and then yearly Cogo-Moreira et al. (2023). The complete battery was initiated if the outcomes of the 3MSE, Clinically Dementia

Evaluation, or ADAS-Cog reached established levels. From 2020 to the study's conclusion in 2024, all subjects completed the extensive neuropsychological assessment yearly.

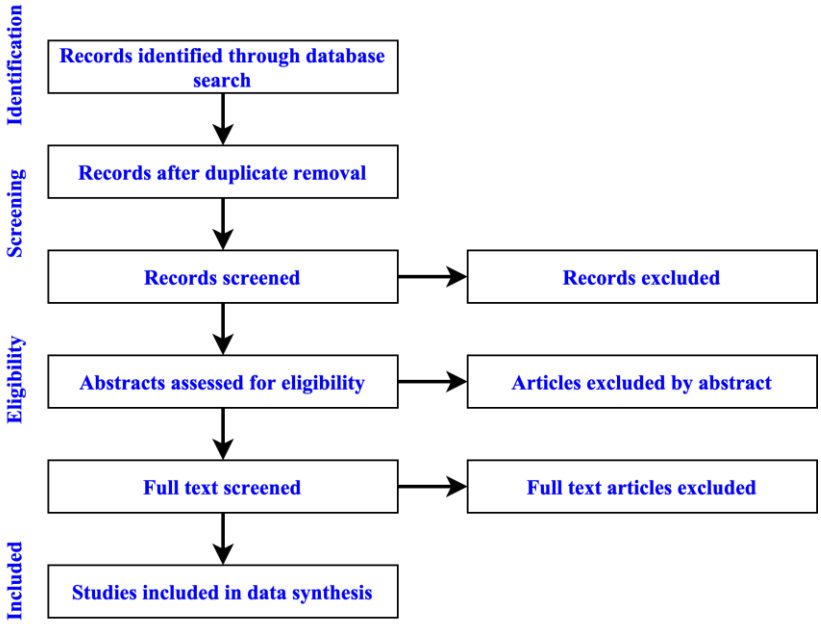

Figure 1: Workflow of the Study

Utilizing a method based on neuropsychological findings, neurologists assessed subjects exhibiting possible cognitive impairment, who then received brain MRI scans. Subsequent possible instances were sent to a panel of clinicians who meticulously examined all medical and mental information, employing a validated determination tool to ascertain the presence of all-cause memory loss or Mild Cognitive Impairment (MCI) at every visit, by the consensus guidelines established by the Global Working Group on Cognitive Problems. MCI was diagnosed based on scores at or below the tenth percentile for age and level of schooling on more than one of the ten neuropsychological assessments, referencing the Cardiovascular Health Study people, alongside a Clinical Dementia Rating global score of 0.5. Second-degree methods were employed to classify Alzheimer's disease precisely.

2.3 Statistical Examination

To verify alcohol intake at the population level, the research evaluated the sex-adjusted associations between high-density lipoprotein triglyceride (1520 respondents) and apoA-1 (1520 participants) concentrations and the quantity of alcoholic beverages consumed. The research utilized Cox proportional hazards calculations to evaluate the risk of all-cause dementia and AD explicitly (restricting non-AD cases now of dementia diagnosis), about alcohol intake, using age as the fundamental time axis. The research first controlled for sex, ethnicity, and clinic location. Following that, the research accounted for educational attainment (years), social engagement, cigarette use, waist circumference, utilization of medications that lower cholesterol, history of heart disease, and presence of diabetes—Institute for Epidemiological Studies Chronic Depression Scale rating, choice of therapy, and APOE ethnicity. To examine if observed correlations differed by gender, age, APOE E4 carrier

position, or initial MCI, the research encompassed these interaction terms. To evaluate straight and quadratic patterns, the research used alcohol intake as an ongoing variable, winsorizing every statistic over the 96.2th % to the 94.2th percentile. The research evaluated the inverse risks assumption using Schoenfeld residuals. The research assessed the probability of dementia due to alcohol intake using Fine & Gray's proportionate subhazard analysis to ascertain the responsiveness of the findings to the opposing risk of mortality. To further elucidate nonlinear connections, the research compared the quantity of alcoholic beverages against dementia risk by employing proportional risks generalized additive equations (3 degrees of freedom). The research assessed the variation in the connection of different kinds of alcoholic beverages with the possibility of all-cause cognition and AD, particularly.

The research evaluated adjusted average changes in global cognitive performance, as shown by 3MSE and ADAS-Cog ratings at follow-up relative to the beginning, based on alcohol intake, using multivariable modified blended linear equations with a randomized endpoint and randomized slope for each participant. The research omitted the first delivery of exams from the study to minimize practice impacts. The results from the 6-month appointment were employed as the benchmark. Future visits' corrected medians were compared, accounting for baseline measurements. The research encompassed their individual interaction terms to examine if the observed connections differed based on carrier state or initial MCI. Every statistical analysis was two-tailed, and $P < 0.05$ was deemed to be significant. Each study was conducted using Stata statistical software version 12.1.

3 DISCUSSIONS

Of 6350 recognized papers, 550 were suitable for full-text examination, and 25 satisfied the inclusion requirements. Most qualifying research was qualitative, including one randomized controlled trial, 12 cohort investigations, and 14 cross-sectional studies, primarily conducted in Europe or North America. Subjects resided in the community (ranging from n = 25 to n = 150k), however several studies evaluated specialized subgroups, including those post-hospitalization or clients of memory clinics. The operational explanations of non-adherence differed, notwithstanding the uniformity in data gathering methods. Methods for determining adherence encompassed: (a) data obtained from electronic monitoring devices; (b) details gathered from health records, including medication fill information and insurance payments; and (c) data derived from surveys or self-report surveys. The variances above were considered while formulating wider findings.

3.1 Factors About Patients

Variables favorably correlated with compliance included ancestry, elevated health literacy, knowledge of the treatment's goal, and the repercussions of omission. Concerning disorders, only cancer enjoyed a favorable correlation with devotion. Demographic characteristics adversely correlated with commitment included advanced age and male gender. However, these connections were tenuous. Heavy drinking was inversely associated with adherence to health habits. Additional characteristics adversely correlated with adherence were the neurotic temperament (other personal characteristics did

not significantly influence adherence), previous hospital stay, and insufficient contact with an overall physician. Increased comorbidity levels were associated with decreased adherence.

In comparison to those without these conditions, stroke, falls, sleep disturbances, and chronic bronchitis were identified as having a distinct adverse impact on adherence owing to their existence. A conclusion was made that memory loss negatively correlates with adherence, but those findings contradicted data from two smaller trials. Both investigations showed no connection and had limited sample sizes; one enrolled individuals through a memory center without a healthy reference comparator. General schooling did not correlate with compliance or psychiatric disorders. The two research findings on relationships with body mass index had conflicting results.

3.2 Pharmacological Factors

The only pharmaceutical element positively correlated with compliance was undergoing an examination of medications during the last six months, albeit this was evaluated in just one trial. Variables adversely correlated with compliance included newly altered pharmaceutical regimens and those regimens developed with the cooperation of a larger number of prescribing doctors. Patient unhappiness with the medication formulation and challenges related to drug preservation, including drug buildup and disorganized storage, were inversely correlated with compliance.

Overall, adherence exhibited a negative correlation with an increased quantity of prescription medications, albeit this relationship was not uniform. When studies established a higher threshold for multiple medications (exceeding seven or even nine), a negative correlation with compliance was more probable. Research using a continuous measure of total pill load demonstrated a reduced likelihood of identifying a correlation between multiple medications and compliance. One trial indicated enhanced adherence with an increased pill load. Conformity aids were not uniformly linked to compliance. Research showed that compliance aids were related to administering prescriptions on a particular day, but did not enhance adherence to the appropriate dose or schedule.

3.3 Institutional Variables

Six research studies examined the existence of a caretaker, with five indicating no correlation with compliance. Research revealed that an in-home caregiver enhanced adherence among individuals with moderate cognitive decline. No unanimity existed across studies on the individual's living environment, nor on whether the individual lived independently or with others.

4 CONCLUSION

This research reinforces that failure to adhere is common among elderly patients and arises from several factors. The research proposes that treatments aimed at enhancing compliance in this group are most efficacious when implemented as a medication assessment, focused on streamlining prescription schedules and educating patients on the indications of specific therapies. Consolidating care to a single provider would decrease the number of doctors prescribing and regulate the frequency of treatment

modifications. Moreover, altering the formulation to align with the individual's preference and assessing for medication storage issues effectively enhances adherence. Specifically, addressing those with dementia and multiple medical conditions would address a vulnerable population with insufficient resources.

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