A systematic review on the determinants of medication adherence in older adults with hypertension

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Abstract

Introduction. Medication adherence is a key element in controlling blood pressure when lifestyle modifications fail to achieve blood pressure targets. The degenerative process challenges the ability to adhere to medication in older adults.

Objective. This research aimed to systematically investigate the determinants of medication adherence in older adults with hypertension.

Materials and Methods. A systematic searching strategy in six databases, such as Science Direct, PubMed, Proquest, SAGE, and Emerald was applied in this study. Studies after 2012 were included in this research, and then followed Preferred Reporting Items for Systematic Reviews.

Results. Of 887 studies identified, 12 were included in the data synthesis. Self-management, health literacy about hypertension and antihypertensive agent, cognitive function (memory), belief, and subjective life expectancy were identified as determinants of medication adherence in older adults with hypertension. Memory functions are the strongest determinant in medication adherence among the elderly.

Conclusions. Interventions increasing memory ability, such as strategies for remembering, rewarding, and reinforcement, are needed in the population of elderly with hypertension.

Introduction

Non-adherence to taking the medication regimen was a major obstacle in the treatment of chronic diseases.¹ The degenerative process experienced by the elderly further exacerbates the problem of medication adherence.² Elderly people with hypertension with comorbidities, get drugs in large quantities and types. This complicated condition can reduce medication adherence in elderly people with hypertension. Pharmacological therapy in the form of single or combination antihypertensive can be started in patients with grade II hypertension and grade I hypertension with aggravating disease.³ This pharmacological therapy is given if blood pressure cannot be achieved through lifestyle modification.⁴ Age has an interesting relationship pattern with medication adherence.⁵ In certain age groups, adherence to medication shows poor condition.⁶ In this systematic review, the determinants of medication adherence in certain age groups will be examined explicitly and focus on certain diseases. The results of this systematic review are expected to provide an overview of the determinants of adherence to taking antihypertensive drugs in a certain age range.

Materials and Methods

In the literature search method, we have combined several keywords based on research questions: (a) hypertension (b) medication (c) adherence and (d) elderly. We have also combined some keywords with the conjunction AND.

The researcher screened for title duplication and then identify whether the abstract met the research inclusion criteria. After that, the researcher proceeded to the full-text assessment process. We used the Rayyan platform (https://www.rayyan.ai/) to organize this
systematic review process. Most of the screening process was carried out by the first author (N.A.), with the sample independently screened by a second reviewer (I.N.).

We used the following inclusion criteria in our literature search strategy:

- **Population**—The research included is research that uses a sample of the elderly group aged more than 55 years or the average of the sample is more than 55 years.
- **Intervention**—Both intervention and non-intervention studies are included in the inclusion criteria.
- **Outcome**—Medication adherence was one of the outcome measures.
- **Analysis**—Studies that have conducted an analysis of the determinants of medication adherence in the elderly with increased blood pressure.

We used the following exclusion criteria in our literature search strategy: written in non-English language; studies published before 2012; articles without a full peer review process.

**Data extraction**

Data were entered into a custom template made by the first author (N.A.). Data were also extracted twice independently by both the first and second authors (N.A. and I.N.). The author carried out the extraction process for some important information in the study, such as design, location, sample size, and demographics of the participants, method, and result.

**Results**

The search of Science Direct, PubMed, ProQuest, SAGE, and Emerald retrieved 887 publications, 583 of that publications were duplicates. After that, the researcher screened for the title and abstract. We excluded 546 articles by assessing the title and abstract because they were irrelevant. After that, we assessed the 25 articles for full-text review. 12 full papers met the criteria for this research inclusion inclusion (Figure 1). A detailed review is presented in Table 1. The papers of those eligible for inclusion were most observational studies (3 randomized controlled trials, 2 cohorts, 1 retrospective, and 6 cross-sectional). Participants were older adults (aged 55 or more) diagnosed with hypertension (range n=73 to n=8333). The operational definition of adherence to medication was the same, where the sample was called non-adherence if they were not taking medication according to the schedule and amount set by the doctor. Methods to assess medication adherence included direct and indirect measurements. Direct methods to identify medication adherence such as analysis of serum. Indirect measurements such as self-report, pill count, interviews, electronic pill box, and questionnaire. More indirect measurement methods are used (n=12) than direct methods (n=1).

**Discussion**

Adherence to medication regimen in the elderly patients was
Table 1. Characteristics of included studies.

<table>
<thead>
<tr>
<th>Citation</th>
<th>Aim</th>
<th>Methods</th>
<th>Subject</th>
<th>Covariate</th>
<th>Conclusion</th>
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<tbody>
<tr>
<td>Grant A.B., et al. 2016</td>
<td>To investigate the effects of expectation of hypertension care on medication adherence.</td>
<td>RCT. The researcher assessed medication adherence, hypertension knowledge, perceived social support, and expectation of care.</td>
<td>442 hypertensive African Americans.</td>
<td>Knowledge or health literacy, social support, expectancy</td>
<td>Medication adherence among black elderly people has a strong relationship with the expectation of care and social support.</td>
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<td>Insel K.C. et al., 2016</td>
<td>This study aimed to determine the effect of the method of administering antihypertensive drugs with memory strengthening techniques on adherence to taking medication.</td>
<td>RCT. All participants used medication containers with a MEMS cap (an electronic monitoring cap) and the researcher follow up for 4 weeks.</td>
<td>The participants were selected from community-dwelling adults aged 65 or more with self-managing antihypertensive agents.</td>
<td>Cognitive function (memory)</td>
<td>The MEMS cap (an electronic monitoring cap) using increasing medication adherence in the elderly.</td>
</tr>
<tr>
<td>Jeon H.O. 2020</td>
<td>To identify the relationships between the research variables to medication adherence in elderly.</td>
<td>Cross-sectional study using data from the 2017 National Survey of Older Koreans.</td>
<td>The sample consist of 8333 household-dwelling participants aged 65 or more.</td>
<td>Cognitive function, depression, ability to do activities of daily living, and the ability to see and hear.</td>
<td>Medication adherence among the Korean elderly can be achieved by increasing cognitive function (memory).</td>
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<td>Park Y., Kim H., Jang S., 2012</td>
<td>To identify significant factors contributing to medication adherence among the Korean elderly with hypertension.</td>
<td>Cross-sectional research of factors contributing to antihypertensive medication adherence.</td>
<td>The participants were 241 older adults (aged 65 years or more) with hypertension.</td>
<td>Cognitive function (metamemory), socioeconomic (age, job), hypertension history,</td>
<td>Memory function was the most important factor in medication adherence among the Korean elderly population.</td>
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<tr>
<td>Rahmawati, R. Bajorek, B., 2018</td>
<td>To investigate the factors that predict medication adherence in older adults who lived in a rural areas.</td>
<td>Cross-sectional study in a rural areas.</td>
<td>The participants were 350 elderly (aged 45 years or older) diagnosed with hypertension by a healthcare professional, residing living in rural areas.</td>
<td>Knowledge/health literacy.</td>
<td>Determinants of medication non-adherence in elderly hypertension who lived in rural areas were low health literacy, low educational level, and being far from healthcare facilities.</td>
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<tr>
<td>Rodgers J.E. et al., 2018</td>
<td>To identify the relationship between medication adherence in the elderly with demographic, socioeconomic, and disease burden measures.</td>
<td>Prospective epidemiological study.</td>
<td>The samples were 6.279 who reported taking one or more medication.</td>
<td>Cognitive function, physical health, mental health.</td>
<td>Both physical and mental health have a strong influence on medication adherence. However, mental health has a stronger influence than physical health.</td>
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<td>Swiatiowska-Lone et al., 2021</td>
<td>To identify the relationship between beliefs about medication and the level of intentional non-adherence to healthcare in elderly with hypertension.</td>
<td>Cross-sectional study.</td>
<td>The participants consist of 300 outpatients with hypertension.</td>
<td>Age, belief about medicine.</td>
<td>Determinants of intentional non-adherence include concerns, age, multi-morbidities, and being single.</td>
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<td>Tan B.Y., et al. 2017^14</td>
<td>This study aimed to explore the relationship between treatment efficacy and adherence with a calendar blister pack intervention.</td>
<td>A parallel RCT for 7 months.</td>
<td>The samples were 73 hypertensive patients at Hospital Kulim, Malaysia.</td>
<td>Technical method in antihypertensive consumption.</td>
<td>Antihypertensive drug packaging in calendar blisters can improve medication adherence in elderly patients with hypertension.</td>
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<td>Tan Y.W., et al., 2019^15</td>
<td>To identify the relationship between poly-pharmacy with medication non-adherence in the elderly with hypertension.</td>
<td>Longitudinal survey of community-dwelling elderly with hypertension in Singapore.</td>
<td>1572 elderly, who were aged more than 66 years.</td>
<td>Poly-pharmacy, comorbid, self-management.</td>
<td>Medication non-adherence has a strong association with poly-pharmacy in the elderly with hypertension.</td>
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<td>Ueno H., et al. 2021^16</td>
<td>To identify the factors related to the ability of self-care and medication in the elderly with hypertension.</td>
<td>Cross-sectional study.</td>
<td>500 home-dwelling elderly people aged 65 or more who were consuming antihypertensive agents.</td>
<td>Cognitive function (dementia), health literacy/ knowledge, communication with health care provider.</td>
<td>The ability to obtain, understand, and communicate information from a healthcare provider plays an important role in medication adherence among the elderly with hypertension.</td>
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<td>Whittle J. et al., 2016^17</td>
<td>To identify factors predicting medication adherence in the elderly with hypertension (visit to the doctor).</td>
<td>A retrospective analysis.</td>
<td>632 elderly hypertension with antihypertensive agents such as amiodipine, chlorthalidone, or lisinopril.</td>
<td>Socio-demography (age, sex, ras), smoke.</td>
<td>Patients who routinely control were not associated with obedient behavior in taking antihypertensive agents.</td>
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<td>Woodham N., et al., 2018^18</td>
<td>To identify medication adherence to antihypertensive agents among the elderly who lived in villages.</td>
<td>Cross-sectional study with simple random sampling.</td>
<td>The participants were 984 elderly aged 60 or older with hypertension who had a history of uncontrolled blood pressure.</td>
<td>Family support.</td>
<td>Family support especially having a daughter as a care taker at home was significantly associated with medication adherence in the elderly with hypertension.</td>
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determined by patient-related factors, therapy-related factors, social/ economic factors, health system/ HCT factors, and condition-related factors. Factors positively related to medication adherence in older adults included self-management, health literacy about hypertension and antihypertensive agent, cognitive function (memory), belief, and subjective life expectancy.

The elderly group generally has hypertension-concomitant diseases such as diabetes mellitus which can affect their general health condition. Older adults with comorbidities consumed more amounts and types of drugs than other hypertensive patients. The amount of antihypertensive agents that must be consumed by the elderly can reduce the level of medication adherence. Not only the amount but the side effects of the drug must also be identified in elderly hypertensive patients with comorbidities. Poly-pharmacy has been shown to reduce medication adherence in elderly.

To improve adherence to taking medication in the elderly group with multiple drug consumption, it is necessary to educate them about the importance of taking medication according to a schedule and the effects of not taking medication. In an elderly group, outpatients who worried about the adverse effects of medication would show non-adherence. Patients who perceived antihypertensive agents side effects as not a barrier and believe in the importance of taking medication showed a better level of medication adherence.

Adherence to taking medication in the elderly is influenced by health literacy skills, including the ability to understand health information. The healthcare provider must have good communication skills and consider the factors of dementia in the elderly that might affect the ability of the elderly to understand the information that has been provided. The expectation of care mediated the relationship between hypertension knowledge and medication adherence. The expectation of care also being important factors in increasing medication adherence in the elderly. Not only health literacy, but cognitive function became a significant determinant of medication adherence in the elderly with hypertension. Worse cognitive function was found to be associated with a greater level of non-adherence. The elderly with mild cognitive impairment was associated with lower medication adherence. Therefore, the health care provider must conduct cognitive function assessments in the elderly to be aware of non-adherence in taking medication caused by problems with cognitive decline.

The most important findings of this systematic review are: (a) self-management, health literacy about hypertension and antihypertensive agent, cognitive function (memory), belief, and subjective life expectancy were identified as determinants of adherence to medication regimens in older adults with hypertension, and (b) memory functions are the important elements to medication adherence among older adults. Healthcare providers should consider special interventions for the elderly hypertension population.

Memory functions are important elements in medication adherence among older adults. Healthcare providers should consider special interventions for the elderly hypertension population with decreased cognitive function so that medication adherence can be realized. The interventions carried out can be focusing on strengthening memory which includes remembering, reward, and reinforcement.

Conclusions

Memory functions are important elements in medication adherence among older adults. Healthcare providers should consider special interventions for the elderly hypertension population with decreased cognitive function so that medication adherence can be realized. The interventions carried out can be focusing on strengthening memory which includes remembering, reward, and reinforcement.

References