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Interventions to Improve Medication Management in the Aging Population: An Evidence-Based Practice Project

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Keywords: aging, cognition, medication management, older adults, primary care

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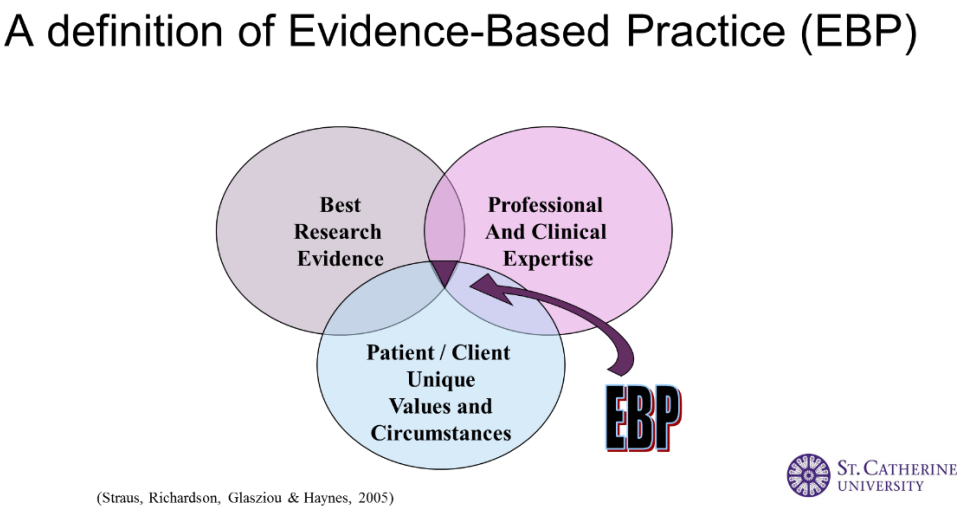
Introduction

Evidence Based Practice

Evidence based practice is defined as the integration of knowledge from professional and clinical expertise, patient/client unique values and circumstances, and best research evidence (Straus, Richardson, Glasziou, & Haynes, 2005). The EBP courses in the St. Catherine University occupational therapy programs emphasizes skill building in finding, analyzing, and synthesizing research.



The EBP Project

Occupational therapy graduate students at St. Catherine University complete an EBP project in partial fulfillment of the requirements for a course on Evidence-Based Practice.

The EBP Process

- Begins with a practice dilemma
- Dilemma is framed as an EBP question and PICO
  P (population/problem) I (intervention) C (comparison group) O (outcome(s) of interest)
- Background learning
- Search for the best evidence
- Initial appraisal and critical appraisal of the evidence
- Summary of themes from the evidence
- Recommendations for practice
- Next steps – implementation in practice

EBP Practice Dilemma: Evidence Based Practice Case Scenarios

The overall focus of each of case scenarios are related to assessment or interventions that are related to Choosing Wisely Campaign® items 1, 2, 3, 5, 8, 10. Case scenarios were developed related to each initiative with clientele and conditions across the lifespan in various practice settings. Practice settings included school district, outpatient pediatric, primary care, skilled nursing facility, work rehabilitation, and acute care.

Six EBP Projects: Choosing Wisely Campaign®

(Things Providers and Patients Should Question)

The six projects are representative of 6 campaign things for the Choosing Wisely Campaign® initiatives. There are a total of 10 campaign things that are promoted by the American Occupational Therapy Association.

Thing 1: Don't provide intervention activities that are non-purposeful (e.g., cones, pegs, shoulder arc, arm bike).

Thing 2: Don't provide sensory-based interventions to individual children or youth within documented assessment results of difficulties processing or integrating sensory information.

Thing 3: Don't use physical agent modalities (PAMS) without providing purposeful and occupation-based intervention activities.

Thing 5: Don't provide cognitive-based interventions (e.g., paper and pencil tasks, table-top tasks, cognitive training software) without direct application to occupational performance.

Thing 8: Don't use reflex integration programs for individuals with delayed primary motor reflexes without clear links to occupational outcomes.

Thing 10: Don't provide ambulation or gait training interventions that do not directly link to functional mobility.

Background on Choosing Wisely Campaign®

Choosing Wisely started in 2012 by American Board of Internal Medicine (ABIM) and *Consumer Reports®,* which includes 75 health care provider organization partners, with the American Occupational Therapy Association (AOTA) being one of the organizations. Choosing Wisely aims to promote meaningful conversations between health care practitioners and clients to ensure that appropriate and quality care is being provided (AOTA, 2021). The mission is helping health care providers and clients in making informed and effective health care decisions, promote effective health care resources, and improve quality and safety of health care in the United States (AOTA, 2021). More specifically, campaign promotes assessment and interventions are evidence based, effective, necessary, safe, and not duplicated among health care providers including occupational therapy practitioners. Experts within this campaign developed and published 10 things providers and clients should question with occupational therapy services across various practice settings (Table 1).

Table 1

10 Things Patients and Providers Should Question

Thing	Related Item
1	Don't provide intervention activities that are non-purposeful (e.g., cones, pegs, shoulder arc, arm bike).
2	Don't provide sensory-based interventions to individual children or youth within documented assessment results of difficulties processing or integrating sensory information.
3	Don't use physical agent modalities (PAMS) without providing purposeful and occupation-based intervention activities.
4	Don't use pulleys for individuals with hemiplegic shoulder.
5	Don't provide cognitive-base interventions (e.g., paper and pencil tasks, table-top tasks, cognitive training software) without direction application to occupational performance.
6	Don't initiate occupational therapy interventions without completion of the client's occupational profile and setting collaborative goals.
7	Don't provide interventions for autistic persons to reduce or eliminate "restricted and repetitive patterns of behavior, activities, or interests" without evaluating and understanding the meaning of the behavior to the person, as well as personal and environmental factors.
8	Don't use reflex integration programs for individuals with delayed primary motor reflexes without clear links to occupational outcomes.
9	Don't use slings for individuals with a hemiplegic arm that place the arm in a flexor pattern for extended periods of time.
10	Don't provide ambulation or gait training interventions that do not directly link to functional mobility.

Note. American Occupational Therapy Association. (2021). 10 Things Patients and Providers Should Question

Resources Regarding Choosing Wisely Campaign

What is the AOTA Choosing Wisely Campaign?
Website Link: https://www.aota.org/Practice/Researchers/choosing-wisely.aspx

Implementing the Choosing Wisely Recommendations
Website Link: https://www.aota.org/Publications-News/otp/Archive/2019/implementing-choosing-wisely.aspx

Ten Things Patients and Providers Should Question (Updated July 2021)
Website Link: https://www.choosingwisely.org/societies/american-occupational-therapy-association-inc/

AOTA Choosing Wisely Campaign Resources (Select Clinical Application Resources)
Website Link: https://www.aota.org/Practice/Researchers/choosing-wisely.aspx

References

American Occupational Therapy Association. (2021). *AOTA's Involvement with Choosing Wisely®.* Retrieved from https://www.aota.org/practice/researchers/choosing-wisely.aspx

Appraisals of Best Evidence, Themes, and Recommendations

After searching and finding evidence available from library databases and alternative sources, students conducted an initial appraisal to evaluate the quality and relevance of the evidence and select the best research for further review. Then they conducted critical appraisals of the best formal reviews of primary research (e.g., systematic reviews, meta-analyses) and/or primary/original research studies. One of the steps in the CAP process is to evaluate the strength or level of the research design and the types of conclusions that are possible from each design.

Initial Appraisal

- Quality of the evidence
- Type of evidence and research design
- Investigator qualifications and journal/publication/website
- Journal/publication/website
- Relevance of the evidence

Critical Appraisal

- Appraisal of methods, results, and implications
- Classification of type of research study
    - o Reviews of primary research (e.g., systematic reviews, meta-analyses)
    - o Qualitative studies
    - o Psychometric studies
    - o Primary quantitative research studies
        - ▪ Level 1: randomized controlled trials
        - ▪ Level 2: two groups, nonrandomized/cohort and case control
        - ▪ Level 3: nonrandomized, pretest/posttest and cross-sectional
        - ▪ Level 4: single subject
        - ▪ Level 5: case report or series

After completing initial and critical appraisals, themes are summarized related to the EBP question and other findings that emerged from the evidence. Recommendations for practice and reflection on participating in an EBP project are identified in the conclusions.

Evidence Based Practice Question

What are the current interventions for medication management for aging populations living in the community?

Presentation Slides

Choosing Wisely Campaign: Thing #5

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Choosing Wisely® Campaign

- Thing #5:
  Don't provide cognitive-based interventions (i.e. paper and pencil tasks, table-top tasks, cognitive training software) without direct application to occupational performance.

(AOTA, 2021)

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Case Scenario

You work in a **primary care clinic** located in a large retirement **community**. The primary physicians have noticed **cognitive decline** in their **aging clients (65+ years old)** specific to the occupation of **health management** (i.e. medication management). You are a new occupational therapist hired in primary care and have been tasked with exploring the evidence specific to what occupational therapy could offer in primary care **(outpatient)** to help their aging patients to support cognitive decline with overall health and medication management. More specifically, the doctors want to know what **interventions** occupational therapy could provide that is grounded in evidence to help their aging population with **medication adherence**.

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(AOTA, 2021)

Evidence-Based Practice Question

- What are the current interventions for medication management for aging populations living in the community?

P	I	C	O
Population	Intervention	Comparison	Outcomes
• Individuals 65+ • Community Living • Primary Care Clinic • Cognitive Decline	• Interdisciplinary Team • Education • Medication Management • Environmental Support	• Older Adults Receiving Treatment vs. Not Receiving Treatment	• Medication Adherence and Health Management

Rationale for Evidence

- "To ensure that interventions and assessments are supported by evidence, not duplicative of other tests or procedures already received, free from harm, and truly necessary" (AOTA, n.d.).
- "The use of cognitive-based interventions not based on occupational performance will result in suboptimal patient outcomes" (AOTA, 2018).

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Background Knowledge

- Preliminary Review
  - There are a variety of community living settings for older adults
  - An occupational therapist's role in a primary care setting is assessment and management of function related to activities of daily living

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(Acts Retirement-Life Communities, n.d.; Schell & Gillen, 2019)

Background Knowledge

- Preliminary Review cont.
  - Factors that influence the effectiveness of interventions in older adults experiencing cognitive decline include:
    - Age, previous cognitive impairment, frequency of intervention, & types of intervention
  - Medication management is a prevalent issue in the older adult population

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(Brennan et al., 2020; Peralta et al., 2017; Weir, 2019)

Search Process: Tools

- Date of Search
  - November, 2021
- Database Search
  - MEDLINE/PUBMED
  - CINAHL
  - PSYCHInfo
  - ERIC
  - Science Direct
  - Proquest
  - PEDro
  - OTSeeker

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Search Process: Tools

- Alternative Search
  - Rehabilitation Measures Database
  - American Journal of Occupational Therapy
  - Google Scholar
  - Government Websites (Center for Disease Control, National Institute of Health, Agency for Healthcare Research and Quality, American Psychological Association)
  - American Occupational Therapy Foundation
- Other Resources
  - Functional Performance in Older Adults
  - Ways of Living: Interventions to Enable Participation (5th ed.)
  - Willard and Spackman's Occupational Therapy (13th ed.)

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Search Process: Details

Keywords:

- Older adults, community living, primary care clinic, cognitive decline
- Interdisciplinary, education, environmental support, compliance, medication management
- Interventions, occupational therapy
- Health management, medication adherence

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Search Process: Details

- Inclusion Criteria / Filters
  - Full-text availability, peer-reviewed articles, 2011-2021, English
- Level of Evidence Found
  - Level I, Level II, Level III, Level IV, Level V

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Overview of Initial Appraisals

- Range in Level of Evidence
  - Level I: 19 articles
  - Level II: 4 articles
  - Level III: 4 articles
  - Level IV: 10 articles
  - Level V: 3 articles
- Methodology of Articles
  - Qualitative, quantitative, validation, mixed method, systematic review
- Stakeholders
  - Occupational therapy practitioners, clients, primary care physicians, caregivers
- Article Categories
  - 1: Primary Research Studies
  - 2: Secondary Research Studies
  - 3: Assessments/Measurement Tools
  - 4: Conceptual/Theoretical

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Critical Appraisal #1

Title: A systematic review of medication non-adherence in persons with dementia or cognitive impairment

- **Evidence:** level I
- **Relevance:** older adults and medication management
- **Methodology:** systematic review
- **Findings:** higher levels of cognitive impairment have better adherence rates, caregivers increase adherence rates, memory impacts medication adherence
- **Bottom Line:** caregiver support impacts adherence, standard definition and single method needed

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(Smith et al., 2017)

Critical Appraisal #2

Title: Elder and caregiver solutions to improve medication adherence

- **Evidence:** level IV
- **Relevance:** elders and their caregivers, strategies to improve medication management
- **Methodology:** qualitative
- **Findings:** personal systems/routines, reduce cost and prescribed medications, community-based supports, medical advocates
- **Bottom Line:** strategies perceived most effective by elders and caregivers, credibility to strategies, solutions for future interventions

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(O'Quin et al., 2015)

Critical Appraisal #3

Title: Supporting the medication adherence of older Mexican adults through external cues provided with ambient displays: feasibility randomized controlled trial

- **Evidence:** level I
- **Relevance:** provided an effective intervention for medication management in older adults with mild cognitive impairment.
- **Methodology:** mixed-methods study
- **Findings:** improved medication adherence through auditory and visual reminders, improved caregiver well-being
- **Bottom Line:** external cues can be used to improve medication adherence

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(Zárate-Bravo et al., 2020)

Theme One: Causes of Medication Mismanagement in the Older Adult Population

(Aldila & Walpola, 2021; Holt et al., 2014; O'Quin et al., 2015; Pathak et al., 2020; Sanders & Van Oss, 2013; Smith et al., 2017; Zárate-Bravo et al., 2020)

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Theme Two: Assessments for Medication Management and Cognitive Status

(Holt et al., 2014; Lavsa et al., 2011; Patel et al., 2021; Somerville et al., 2019; Zárate-Bravo et al., 2020; Zhang et al., 2021)

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Theme Two: Assessments for Medication Management and Cognitive Status

(Baum et al., 2008; Roalf et al., 2012)

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Theme Three: Primary Care Team Interventions for Medication Management

1. External Cues & Reminders
2. Access to Medications
3. Education
4. Individualization

(Berger et al., 2018; CDC, 2021; Holt et al., 2014; O'Quin et al., 2015; Sanders & Van Oss, 2013; Zárate-Bravo et al., 2020)

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Theme Four: Impact of Social Support on Medication Management

(Jones et al., 2021; O'Quin et al., 2015; Ploeg et al., 2019; Rohde et al., 2017; Sanders & Voss, 2013; Smith et al., 2017; Valaitis et al., 2020; Zárate-Bravo et al., 2020)

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Summary

- Medication management is an essential task for older adults that can be impacted by personal factors, environmental factors, social support, and cognitive status.
- Treatment should be based on assessment findings and focus on education, implementing cues and reminders, and be unique to the individual.

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Implications For Practice

- Various aspects of medication management
  - Individualization
  - Screenings
  - Caregiver involvement
  - Education
- Implications support our portion of the campaign

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Limitations

- Time constraint
- Finding relevant studies
- Small sample sizes
- Lack of diversity
- Personal biases

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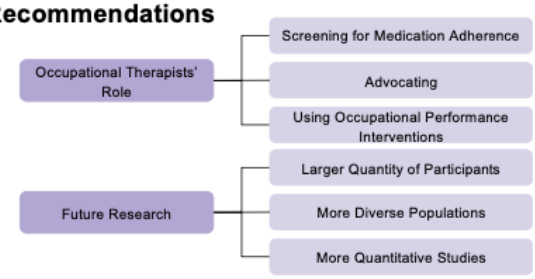
Recommendations



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Conclusion

- Summary
  - Choosing Wisely Campaign
  - Search process
  - Themes
- Key takeaways
  - Important role of occupational therapists in primary care
  - Individualized occupation-based interventions

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Thank You!

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Themes

The purpose of this evidence-based process was to identify intervention strategies in primary care to improve medication management in the aging population living in the community. For the purpose of this study, the aging population is considered to be all older adults over the age of 50 years old. Community-dwelling is defined as adults living outside of nursing homes (Chi et al., 2019). The primary care teams consist of many different providers, including occupational therapists. The occupational therapist's role in a primary care setting varies, but includes working with patients to improve health management, specifically medication management. Medication management includes "communicating with the physician about prescriptions, filling prescriptions at the pharmacy, interpreting medication instructions, taking medications on a routine basis, refilling prescriptions in a timely manner" (American Occupational Therapy Association [AOTA], 2020). Medication management is crucial to address due to the fact that 50-75% of the aging population fails to take medications correctly, which could result in death (Sanders & Van Oss, 2013). After analyzing 25 articles on this topic, four themes were identified in the findings. These themes include causes of medication mismanagement, assessments for medication mismanagement and cognitive status, primary care team interventions for medication management, and the impact of social support on medication management.

Theme One: Causes of Medication Mismanagement in the Older Adult Population

There are many personal factors that may contribute to medication mismanagement. As an individual ages physiological changes occur, including physical changes in dexterity, mobility, and diminished physical senses. These changes make taking medications more difficult (Aldila & Walpola, 2021; O'Quin et al., 2015; Smith et al., 2017). Cultural values and beliefs

about medication can also impact adherence to medication routines as some cultures value alternative medicine practices (Aldila & Walpola, 2021; Holt et al., 2014). Additionally, personal attitudes about medications also impact adherence (Holt et al., 2014; O'Quin et al., 2015). Those who have a "goal-setting" mentality are more likely to adhere to medication routines (Holt et al., 2014; O'Quin et al., 2015), whereas others may intentionally be noncompliant with their medications because of a negative attitude towards them due to concern or poor medication side effects (Holt et al., 2014; Smith et al., 2017).

All of these factors may be exacerbated by impaired cognitive function (Smith et al., 2017). Changes in cognition can make it difficult to remember the purpose of the medication, why it needs to be taken, and what possible side effects or drug interactions there are (Holt et al., 2014; O'Quin et al., 2015). Difficulty remembering to take medications occurs with memory changes that happen in later life (Smith et al., 2017). According to Zárate-Bravo et al. (2020) prospective memory decline -- that is, the ability to remember future intentions -- interferes with medication management. Memory challenges also impact daily routines and habits (O'Quin et al., 2015). Due to medication being embedded into daily routines, a disruption to the routine can cause an individual to forget to take their medication (Sanders & Van Oss, 2013). Routines are further complicated by their complexity (Aldila & Walpola, 2021; O'Quin et al., 2015; Smith et al., 2017). The more medications an individual has to take, the more likely they are to make a mistake and forget to take a medication (Aldila & Walpola, 2021; O'Quin et al., 2015: Smith et al., 2017).

In addition to personal factors, there are also external barriers to medication mismanagement. Researchers have identified that lack of social support can cause medication nonadherence (Aldila & Walpola, 2021; Holt et al., 2014; O'Quin et al., 2015). The presence of a

caregiver or spouse can help the individual remember to take their medication, thus the absence of social support can be a hindrance (Holt et al., 2014; Smith et al., 2017;). Additionally, many older adults rely on social support to access medication refills (Sanders & Van Oss, 2013). Researchers found that nonadherence occurred more often from not having or being able to refill medications (Sanders & Van Oss, 2013). An additional social support that impacts medication adherence is the patient-physician relationship. Poor collaboration between the patient and physician leads to ineffective communication and misunderstandings (Aldila & Walpola, 2021; Holt et al., 2014; Smith et al., 2017). Another barrier is pharmacy convenience (Holt et al., 2014; Pathak et al., 2020). In rural areas especially, pharmacies are at risk of closing, which would decrease access to medication and increase the risk for medication nonadherence in rural older adults (Holt et al., 2014; Pathak et al., 2020). Many researchers have also identified that cost is a large barrier to medication management (Holt et al., 2014; Lee et al., 2018; O'Quin et al., 2015). Older adults have expressed that monthly prescription costs are too high (O'Quin et al., 2015). As a result, patients often have to skip, take smaller doses, or use pill-cutting strategies to make their medication last longer (Holt et al., 2014).

Theme Two: Assessments for Medication Management and Cognitive Status

Many assessments exist for measuring adherence to medications in the aging population. However, only some have been credited by evidence-based research as valid. The Medication Adherence Questionnaire (MAQ), Domain Specific Limitation in Medication Management Capacity (DSL-MMC), Home-Rx, and Morisky Medication Adherence Scale-8 (MMAS-8) measurement tools have been examined through systematic reviews and primary research studies. A systematic review was conducted within PubMed and Ovid databases and identified five medication compliance scales prevalent in the literature (Lavsa et al., 2011; Zárate-Bravo et

al., 2020). The MAQ stood out as the most straightforward and quickest to administer while being widely generalizable to an array of diseases. An additional medication adherence tool was identified through a prospective study involving pharmacists examining the DSL-MMC tool (Patel et al., 2021). The DSL-MMC assesses physical abilities, cognition, medication regimen, and caregiver access (Patel et al., 2021). The results concluded that the measurement tool was valid after looking at relevance, importance, readability, understandability, and representation. Furthermore, the Home-Rx is a vital assessment tool that explicitly considers in-home medication management (Somerville et al., 2019). In a two-phase research study, researchers adapted the tool's scoring scales and administration time to simplify its use. Concurrent validity and interrater reliability were concluded through a 4-hour rating session with 30 older adult participants, indicating that it can measure medication management performance, safety, and any impact on performance barriers (Somerville et al., 2019). Lastly, through a longitudinal cohort study, the MMAS-8 was utilized to determine self-reported medication management for hypertension (Holt et al., 2014). While examining the reliability and validity of the MMAS, Cronbach's α coefficient was 0.625, specifying that internal consistency was acceptable. In addition, Pearson's correlation coefficient was 0.845, indicating that convergent validity was excellent (Zhang et al., 2021). When working with older adults, it is essential to consider cognitive status measurement tools and medication adherence measurement tools.

Assessing a client's cognitive status is essential and recommended when determining whether or not they will be able to manage their medications safely. The Montreal Cognitive Assessment (MoCA) and Mini-Mental State Examination (MMSE) have been utilized to diagnose Alzheimer's and Mild Cognitive Impairment (Roalf et al., 2012). After comparing these assessment tools, the MoCA was more accurate than the MMSE, as it indicated signs of

cognitive decline early on (Roalf et al., 2012). Other than paper-pencil based tests, there are functional performance-based tests used to assess an individual's cognitive status. In one article by Baum et al. (2008), The Executive Functional Performance Test (EFPT) assessed 73 participants with mild to moderate stroke. The participants were asked to complete the four EFPT tasks which include cooking, using the phone, managing their medications, and paying bills. This assessment reveals to a therapist if a client can live independently and the level of support an individual may need, allowing the occupational therapist to develop the most suitable treatment plan for the client in the home or clinic setting (Baum et al., 2008).

Theme Three: Primary Care Team Interventions for Medication Management

There are various primary care team interventions in place that promote medication management in older adults. It is imperative for interventions to be in place that are going to help individuals take their medications as prescribed (Schwartz et al., 2017). One of these strategies is the use of external cues and reminders. According to Zárate-Bravo et al. (2020), external visual and auditory cues can be used to draw individuals' attention and remind them to take their medications. Other cues that have been reported to improve medication adherence are daily routines including meal times and morning/evening hygiene routines (Sanders & Van Oss, 2013). These routine-based reminders are aided by medication placement, chart and calendars, and individualization of the routine (Holt et al., 2014; Sanders & Van Oss, 2013). In all areas of medication management strategies, the use of administration devices and specialized medication containers contributed to increased adherence (Holt et al., 2014; Smith et al., 2017).

Another intervention strategy used by primary care teams to improve medication adherence in older adults is to increase access to the medications. O'Quin et al. (2015) reported that shorter prescription length increases access to appropriate medications. By decreasing the

prescription duration, the possession of unnecessary medication is reduced, minimizing the likelihood of incorrect medication consumption. Additionally, pharmacists can use telepharmacy sessions and tailored pharmacy services such as medication counseling and motivational interviews to increase adherence (Center for Disease Control and Prevention [CDC], 2021; Pathak et al., 2020).

A third strategy for primary care teams to help older adults improve medication adherence is education. This education can be provided to individual patients, caregivers, or in group settings. Holt et al. (2014) found that it is helpful for patients to communicate with healthcare providers when working towards improving medication adherence. Patients also emphasized being more likely to adhere to medication plans when they were educated by a multidisciplinary team and better understood their medications. Similarly, Berger et al. (2018) found improvements in adherence after teaching disease-related problem solving, action planning, and decision making using the manualized Stanford Chronic Disease Self-Management Program. The education techniques found by Berger et al. (2018) can be used by primary care teams in both individual and group settings. Wong et al. (2019) emphasized the improvement of general self-care aspects such as medication adherence after participating in community-based education.

Theme Four: Impact of Social Support on Medication Management

Older adults may rely on social support for medication management. In a study with 21 older adults, Ploeg et al. (2019) found that 90.5% (n = 19) reported having a family member as a caregiver. In that same study, 52.6% (n = 10) of the older adults reported receiving help with medication management specifically (Ploeg et al., 2019). Sanders and Van Oss (2013) also concluded that social support is crucial in enabling participants to adhere to medication

schedules. In a study with 149 community-dwelling older adults, 51% (n = 80) "indicated needing some type of social support in the entire process of taking medications" (Sanders & Van Oss, 2013, p. 95). The degree of social support for older adults may vary depending on the level of independent functioning or cognitive status of the older adult (Rohde et al., 2017). Those with lower-level cognitive impairments are more self-reliant for medication management, while those with a higher level of cognitive impairment are more dependent on others. This can cause older adults with lower levels of cognitive impairment to have poorer medication adherence because they do not have a caregiver providing support. While social support is commonly described as having a caregiver, community-based support can also be an aspect of social support. Although there is minimal research on the effectiveness of community-based support in medication management, O'Quin et al. (2015) discussed how formal or informal community-based support can be helpful in medication adherence with older adults.

Many articles revealed a common theme that older adults have a need for social support in the form of a medical advocate (O'Quin et al., 2015; Valaitis et al., 2020). In a study by Valaitis et al. (2020), 21 healthcare providers indicated that there was a need for social support to accompany older adults to their appointments and be their medical advocates. They further explained that the lack of social support leads to missed opportunities to implement needed supports as older adults begin to struggle with their IADLs, in turn affecting their ability to age in place (Valaitis et al., 2020). O'Quin et al. (2015) emphasized that communication between physicians and pharmacists is important for medication adherence. In these situations, medical advocates help older adults understand what medications they are on, side effects, and potential drug interactions (O'Quin et al., 2015). Medical advocates provide the added benefit of making sure clients feel heard and understand how to manage their medication (O'Quin et al., 2015).

Caregiver involvement can improve medication management (Jones et al., 2021; Rohde et al., 2017; Smith et al., 2017). Smith et al. (2017) noted that caregiver support reduces self-administration and self-medication in older adults, increasing the rates of adherence. However, there are factors that can be hazardous when an individual is dependent on a caregiver or social support for medication management (Jones et al., 2021; Smith et al., 2017). Some of these factors include the caregiver or spouse not living with the older adults, caregiver distress, caregiver/spouse having a cognitive impairment themselves, and an absence of environmental assistance for the caregivers (Smith et al., 2017). Jones et al. (2021) described the cascading effects a caregiver experiences when they aid in medication management. This means that including caregivers in selecting interventions for medication management will lead to the best possible outcomes (Jones et al., 2021; Zárate-Bravo et al., 2020).

Medication management is a complex instrumental activity of daily living (American Occupational Therapy Association, 2020). Many personal and environmental factors can impact medication adherence, which may include cognitive status, access to pharmacies, communication with physicians, financial factors, and cultural values and beliefs about medications (Aldila & Walpola, 2021; Holt et al., 2014; O'Quin et al., 2015; Pathak et al., 2020; Sanders & Voss, 2013; Smith et al., 2017; Zárate-Bravo et al., 2020). There are a variety of tools that are paper-pencil based and performance based that can be used to evaluate an older adult's ability to manage their medications (Baum et al., 2008; Holt et al., 2014; Lavsa et al., 2011; Patel et al., 2021; Roalf et al., 2012; Somerville et al., 2019; Zárate-Bravo et al., 2020; Zhang et al., 2021). The primary care team has the ability to provide interventions to older adults to improve their medication management through external cues and/or reminders, increased access to prescriptions, and education (Holt et al., 2014; O'Quin et al., 2015; Sanders & Van Oss, 2013; Wong et al., 2019;

Zárate-Bravo et al., 2020). Many older adults already rely on social support for assistance in medication management (Ploeg et al., 2019; Sanders & Van Oss, 2013). Social support can improve medication management in older adults as caregiver involvement has been shown to increase medication adherence (Jones et al., 2021; Rohde et al., 2017; Smith et al., 2017; Zárate-Bravo et al., 2020).

Executive Summary

The American Occupational Therapy Association's (AOTA) Choosing Wisely Campaign consists of topics to improve evidence-based interventions in healthcare. One of the topics is that cognitive-based interventions should not be provided without direct application to occupational performance (AOTA, 2021). Our research team examined the question of: What are the current interventions for medication management for aging populations living in the community? During the research process, we discovered causes for medication mismanagement, assessments for determining cognitive status and medication adherence, modes of interdisciplinary interventions to enhance medication adherence, and the impact of social support on medication adherence.

Take Home Message

Primary care teams have a significant role in improving medication management in aging populations. There is a high prevalence of medication mismanagement with multiple causes. Researchers have shown that improvements in older adults' medication adherence can be made through external cues, routines, individualization, pharmaceutical changes, and education (Holt et al., 2014; O'Quin et al., 2015; Sanders & Van Oss, 2013; Wong et al., 2019; Zárate-Bravo et al., 2020). The research we conducted concerns three of AOTA's Choosing Wisely Campaign's objectives: don't provide non-purposeful interventions, don't provide cognitive-based interventions without direct application to occupational performance, and don't initiate occupational therapy interventions without completion of the client's occupational profile and setting collaborative goals (AOTA, 2021). Primary care practitioners, including occupational therapists, should consider all of these factors when aiming to improve aging populations' medication management.

Findings

Our findings show that there are many factors that contribute to medication mismanagement including both personal and external factors. Some personal factors included values, attitudes, and cultural beliefs about medication. Changes in physical abilities and cognitive functioning can also impair medication management. Environmental considerations included lack of social support which can affect both remembering to take medication and accessing refills. Poor patient-physician relationships may lead to misunderstandings about medications. Additionally, the convenience and location of pharmacies impacts access to care. Finally, cost was identified as a barrier, leading patients to alter their routines to make their medications last longer.

The findings related to social support indicate that older adults with lower levels of cognitive impairment have a higher likelihood of medication mismanagement compared to those with higher levels of cognitive impairment. Individuals with higher levels of cognitive impairment are dependent on caregivers for adherence, reducing their chance of mismanagement. Therefore, interventions should focus on populations with lower levels of cognitive impairment and educate caregivers on their vital role in medication management.

Many valid and reliable assessment tools can be used to assess a client's cognitive status or medication adherence ability. By using these assessment tools, occupational therapists can base their interventions on the client’s needs. The findings showed that the most effective interventions to improve medication adherence in older adults were external cues and reminders, the use of daily routines, improved medication access, and increased education on medications.

Strengths

After analyzing our research, the studies revealed many strengths. Our research consisted of a wide variety of studies relevant to our PICO focus. For example, qualitative and quantitative

studies, randomized controlled trials, and systematic reviews were utilized throughout the process. The research we looked at was recent and from credible, peer-reviewed sources. We found that many of our articles expanded on previous research, identified limitations, and offered suggestions for future research.

Limitations

While several strengths were identified throughout the research, there are also existing limitations in the studies we appraised. Some of the articles we discovered consisted of small sample sizes with a specific demographic of participants. Lack of diverse and/or equal groups surrounding gender and race or ethnicity were two factors that seemed to be limiting the findings pertaining to our population of interest. As a result, the findings from these individual studies may not be generalizable to our population focus. Additionally, personal biases toward self-perception may have influenced answers given in some self-reporting studies.

Implications and Recommendations

Implications of our findings show that occupational therapists can change their practice with older adults to improve their medication management. Some recommendations include involving caregivers in medication management interventions and having more discussions about medications and potential barriers to medication adherence. Additionally, occupational therapists can address all aspects of medication management with clients, conduct more screenings for medication management abilities with assessments, and increase education on the medications an older adult is taking. For future research, recruiting a more diverse array and a larger quantity of participants in studies may help to generalize findings to the general population.

Future Considerations

Medication nonadherence has become a prevalent issue among older adults. Involvement of the entire interdisciplinary team is critical, especially pharmacists and primary care providers, in the medication management of their clients. Occupational therapists and other healthcare professionals need to take further steps to decrease the amount of medication nonadherence incidents in the aging population. While several interventions address medication management, not every intervention is applied to occupational performance.

Conclusion

The goal of our evidence-based research process was to gain a better understanding of the current interventions for medication management in the aging population who are living in the community. After appraising the evidence, we identified strengths and weaknesses, limitations, recommendations, and future considerations pertaining to medication management interventions for older adults. We found various causes for medication mismanagement, assessments for determining both cognitive status and medication adherence, multiple modes of primary care team interventions to enhance medication adherence, and the impact of social support on medication adherence. Based on these findings, interdisciplinary care teams can be better informed about current issues regarding medication management and effective interventions to promote medication safety and adherence.

Evidence Based Practice Resources

Table 1

Governmental and Major Foundation Resources

Title/Name	Brief Description	Source
Agency for Healthcare Research and Quality	This resource provides general information on cognitive decline in older adults, as well as possible interventions for preventing cognitive decline. There is also information on medication management of older adults and medication management approaches. AHRQ has resources for identifying, diagnosing, and preventing Alzheimer's disease.	https://www.ahrq.gov/
Alzheimer's Association	This website has information about the background of Alzheimer's and dementia. It provides resources for the caregivers about the stages, safety concerns, care options, and financial/legal plans. It also gives a list of ways to approach memory concerns.	https://www.alz.org
Mayo Clinic	This website has information on mild cognitive impairments such as symptoms, causes, diagnosis, and treatment. It provides information on dementia and Alzheimer's. The website also may have some of its own research studies around cognition and aging.	https://www.mayoclinic.org
National Institutes of Health	NIH has information on cognitive decline and normal cognitive aging. It also provides information on medication management in older adults and medication management approaches.	https://www.nih.gov/

Table 2

Occupational Therapy Resources

Title/Name	Brief Description	Source
American Occupational Therapy Association (American Journal of Occupational Therapy)	AOTA is the website for OT resources and AJOT is the academic journal in relation to it. AOTA Provides information on career and education within OT. In addition, it provides information on various specialties within OT, such as productive aging and mental health.	https://www.aota.org
Bonder Older Adults Textbook	A class textbook about older adults. Has relevant information regarding cognitive function, older adults, and primary care. Book also discusses the future of aging which may help with forward-thinking of our question. • Chapter 7 • Chapter 12 • Chapter 30 • Chapter 35	Textbook
Occupational Therapy in Healthcare	Information on current OT practice and methods, practical applications, program and fieldwork innovations, and practice models. This resource helps practitioners stay up to date on the changing trends/methods in the OT field. One of the main themes of this journal is older adults.	https://www.tandfonline.com/toc/iohc20/current
Ways of Living Textbook (5th ed.)	This textbook provides information about working with older adults. It also provides information on OT and primary	Textbook

	care, Alzheimer's and TBIs, and information on intellectual and developmental disabilities. Several authors created this text, with various perspectives.	
Willard & Spackman Textbook	Willard & Spackman is a class textbook about occupational therapy. This textbook provides information about intervention strategies, occupational justice and comprehensive and current presentation of OT concepts and practice	Textbook

Table 3

Interdisciplinary Journals, Databases, and Professional Associations

	Title/Name	Brief Description	Source
1	American Psychological Association	APA has information on Alzheimer's. It also has information on the aging process. Topics that this website also covers include learning and memory.	https://www.apa.org/
2	Physical & Occupational Therapy in Geriatrics	This is an interdisciplinary journal (between PT and OT) that aims to share research that advances preventative, clinical, educational, and therapeutic practices. Information on cognitive evaluations and assessments for older adults. Could have more information on interventions for cognitive decline and medication management.	https://www.tandfonline.com/loi/ipog20
3	Health Expectations	Contains information about all aspects of patient and public involvement and engagement in health and social care, health policy, and social services research. Focuses on person-centered care and quality improvement. Also has information on methods for monitoring and evaluating participation.	https://ovidsp.dc2.ovid.com/ovid-a/ovidweb.cgi?&S=AFHIFPPMAHEBKHLGIPOJAHPEBLLCAA00&Browse=Toc+Children%7cYES%7cS.sh.22.23.28.29%7c1355%7c50
4	PubMed	PubMed is a database for over 33 million citations for biomedical literature.	https://pubmed-ncbi-nlm-nih-gov.pearl.stkate.edu/?otool=stkatelib

		It uses MeSH headings for search terms. It is aimed at improving health globally and personally.	
5	Memory & Cognition	Journal that contains articles relating to human memory, learning, and concept processes. Discusses current work in information processing, computer simulation, and mathematical psychology.	https://link.springer.com/journal/13421/volumes-and-issues

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Appendix A. Initial Appraisals

Primary Research Study

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Literature Review
APA Reference	Funderburk, J. S., Shepardson, R. L., Wray, J., Acker, J., Beehler, G. P., Possemato, K., Wray, L. O., & Maisto, S. A. (2018). Behavioral medicine interventions for adult primary care settings: A review. *Families, Systems, & Health, 36*(3), 368-399. http://dx.doi.org/10.1037/fsh0000333
Abstract	"Introduction: Health care organizations are embracing integrated primary care (IPC), in which mental health and behavioral health are addressed as part of routine care within primary care settings. Behavioral medicine concerns, which include health behavior change and coping with medical conditions, are common in primary care populations. Although there are evidence-based behavioral interventions that target a variety of behavioral medicine concerns, integrated behavioral health providers need interventions that are sufficiently brief (i.e., ≤6 appointments) to be compatible with IPC. Method: We conducted a literature review of published studies examining behavioral interventions that target prevalent behavioral medicine concerns and can feasibly be employed by IPC providers in adult primary care settings. Results: A total of 67 published articles representing 63 original studies met eligibility criteria. We extracted data on the behavioral interventions employed, results comparing the active intervention to a comparison group, general fit with IPC, and methodological quality. The vast majority of studies examined brief interventions targeting sleep difficulties and physical activity. The most commonly employed interventions were derived from cognitive-behavioral therapy and motivational interviewing. Outcomes were generally statistically significantly in favor of the active intervention relative to comparison, with highly variable methodological quality ratings (range = 0–5; M = 2.0). Discussion: Results are discussed in relation to the need for further evidence for brief behavioral interventions targeting other behavioral medicine concerns beyond sleep and physical activity, as well as for more specificity regarding the compatibility of such interventions with IPC practice" (p. 368).
Author	Credentials: Doctorate in clinical psychology. Position and Institution: Adjunct Associate Professor at Syracuse University, and an Adjunct Senior Instructor at the University of Rochester Department of Psychiatry. Publication History in Peer-Reviewed Journals: Extensive

Publication	Type of publication: Scholarly peer reviewed journal. Publisher: American Psychological Association, Inc.
Date and Citation History	Date of publication: 2018 Cited By: 15
Stated Purpose or Research Question	"Therefore, the purpose of this descriptive review was to provide an overview of the literature on behavioral medicine interventions and their match with IPC delivery within an adult PC population" (p. 368).
Author's Conclusion	"Overall, this literature review identified that future research examining behavioral interventions suitable for the IPC environment is warranted" (p. 388).
Overall Relevance to your EBP Question	Overall Relevance of Article: Poor Rationale: This addresses the issue of lack of interventions in a primary care setting. This article isn't specific enough to the main point of our question of older adults and medication management interventions.
Overall Quality of Article	Overall Quality of Article: Good Rationale: The author is highly valued in terms of research and looks at this issue from a unique lens.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Interview & focus group
APA Reference	O'Quin, K. E., Semalulu, T., & Orom, H. (2015). Elder and caregiver solutions to improve medication adherence. *Health Education Research*, *30*(2), 323–335. https://doi.org/10.1093/her/cyv009
Abstract	"Medication mismanagement is a growing public health concern, especially among elders. Annually, it is a major contributor to emergency hospitalization and nursing home placement. Elders and their caregivers, as healthcare consumers and stakeholders in this issue, are uniquely qualified to inform strategies to improve medication adherence. We conducted a qualitative study to ascertain caregiver and elder perceptions of barriers to medication management and to identify community-derived solutions to improve medication management. Nine focus groups (N = 65, mean age = 71) were conducted with caregivers or elders from five communities. Participants were recruited by key informants utilizing snowball sampling methodology. The following themes were identified in the participant-recommended proposed solutions improving medication adherence: (i) use of personal systems to overcome barriers to medication adherence, (ii) various solutions to address cost concerns, (iii) the need for regular review of medications by doctors or pharmacists to eliminate unnecessary medications, (iv) desire for community-driven support systems, and (v) using medical advocates. Elders and caregivers recognized medication non-adherence as a community-wide issue and were eager to offer solutions they thought would work in their communities. These solutions can lend credibility to strategies currently being developed/utilized and offer innovative recommendations for future interventions" (p. 323).
Author	Credentials: PhD Position and Institution: She recently returned to the faculty after serving as Associate Dean of the School of Natural and Social Sciences at Buffalo State. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer reviewed journal articles. Publisher: Health Foundation of Western and Central New York
Date and Citation History	Date of publication: 2015 Cited By: 37
Stated Purpose or Research Question	"The purpose of this study was to report common barriers to medication management experienced by elders and their caregivers, and to describe solutions conceived of, and endorsed by elders and caregivers" (p. 323).
Author's Conclusion	"Participants in the focus groups recognized that medication mismanagement was an issue for themselves and their friends, relatives and neighbors. The solutions they identified are noteworthy because they were generated by people dealing with managing medications on a regular basis and they are solutions that elders and caregivers believe would promote medication adherence and improve health-related quality of life for themselves, their peers and their communities" (p. 328).

Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article relates back to our EBP question focusing on the older adult population and the need for intervention strategies to help with medication management. The article also looks at barriers and possible solutions to improve medication management.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article was clearly written and provided evidence as to why the intervention strategies are needed for this population.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Interview
APA Reference	Sanders, M. J., & Van Oss, T. (2013). Using daily routines to promote medication adherence in older adults. *American Journal of Occupational Therapy, 67*(1), 91–99. https://doi.org/10.5014/ajot.2013.005033
Abstract	"Purpose: To understand the medication routines used by older adults taking four or more medications daily. Method: One hundred forty-nine community-dwelling older adults were interviewed about the individual routines, storage locations, equipment, and assistance that enabled their adherence to a medication regimen. A subsample of 84 older adults was observed completing one medication routine in their home environments. Findings: Medication habits were embedded in mealtime, wake-up, and sleep routines for 91% of the sample. Participants developed unique, individualized behaviors for taking medications that were choreographed within broader daily routines. The primary locations for storing medications were the kitchen and bathroom. Equipment used to promote adherence was primarily pillboxes or self-made adaptations. More than 50% of the entire sample required some type of assistance related to medication adherence. Implications: Findings support the role of occupational therapists in collaborating with clients to develop individualized medication routines to promote medication adherence" (p. 91).
Author	Credentials: PhD Position and Institution: Associate professor at Quinnipiac University Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer reviewed journal article Publisher: AOTA
Date and Citation History	Date of publication: 2013 Cited By: 69
Stated Purpose or Research Question	"To understand the medication routines used by older adults taking four or more medications daily" (p. 91).
Author's Conclusion	"Medication habits were embedded in mealtime, wake-up, and sleep routines for 91% of the sample. Participants developed unique, individualized behaviors for taking medications that were choreographed within broader daily routines. The primary locations for storing medications were the kitchen and bathroom. Equipment used to promote adherence was primarily pillboxes or self-made adaptations. More than 50% of the entire sample required some type of assistance related to medication adherence" (p. 95).

Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article relates to the EBP question as it shows the importance of an intervention for older adults to take their medication on a routine. This is an intervention that could be used in a primary care setting.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article was easy to understand with a fairly large sample size. The author has written an extensive amount of other articles related to this topic.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Discussion
APA Reference	Schwartz, J. K., & Smith, R. O. (2017). Integration of medication management into occupational therapy practice. *American Journal of Occupational Therapy, 71*(4), 1-7. https://doi.org/10.5014/ajot.2017.015032
Abstract	"Occupational therapy practitioners enable clients to improve performance in everyday occupations. As health care reform precipitates changes across health care service organizations, occupational therapy professionals must seize the opportunity to apply their unique skills and perspective to meet the changing needs of clients and other stakeholders. In this article, we explore the role and distinct value of occupational therapy practitioners in one area of changing need: medication management. We find that occupational therapy practitioners have unique skills that complement the factors affecting medication nonadherence and evidence-based interventions. With reforms to research, teaching, and practice, occupational therapy practitioners can better integrate medication management into regular evaluation and treatment, thereby contributing to broader patient outcomes defined by the Affordable Care Act" (p. 1).
Author	Credentials: PhD Position and Institution: Assistant OT professor at Nicole Wertheim College of Nursing and Health Sciences. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer reviewed journal article Publisher: AOTA
Date and Citation History	Date of publication: 2017 Cited By: 17
Stated Purpose or Research Question	"Through this process, we seek to accomplish three goals: (1) define medication management and understand its importance within the scope of health care reform, (2) describe the distinct value of occupational therapy within the context of medication management, and (3) understand the changes needed to help the profession reach full potential as a service provider in this area" (p. 1).
Author's Conclusion	"Health care reform has provided the motivation and timing to enable occupational therapy practitioners to affect change in the area of medication adherence. By engaging in medication management, the profession can demonstrate the value of occupational therapy to clients, professional peers, and payers" (p. 5).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article relates to the EBP question as it illustrates the significance of the role of an occupational therapist with medication management. The article also discusses the unique skill set of occupational therapist practitioners that assists with medication management techniques.
Overall Quality of Article	Overall Quality of Article: Good Rationale: While this article was a discussion, it provided a lot of background information such as, defining medication management, and the current practice.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Observational
APA Reference	Somerville, E., Massey, K., Keglovits, M., Vouri, S., Hu, Y.-L., Carr, D., & Stark, S. (2019). Scoring, clinical utility, and psychometric properties of the in-home medication management performance evaluation (HOME–Rx). *American Journal of Occupational Therapy*, *73*(2), p1-8. https://doi.org/10.5014/ajot.2019.029793
Abstract	"Importance: Forty percent to 75% of community-dwelling older adults are not able to adhere to their medication routine. A medication management assessment can correctly identify the reasons for nonadherence and the barriers contributing to it. Objective: To further develop the HOME–Rx, an in-home medication management assessment, by modifying scoring metrics, improving clinical utility, and establishing psychometric properties. Design: In Phase 1, the scoring metrics were modified, and the clinical procedures were evaluated. In Phase 2, the psychometric properties were established. Setting: The homes of older adults. Participants: Older adults who took three or more medications, managed their own medications, and lived in their own home were eligible. Older adults with cognitive impairment were ineligible. Outcomes and Measures: We assessed concurrent validity with the Performance Assessment for Self-Care Skills (PASS) and Medication Management Instrument for Deficiencies in the Elderly (MedMaIDE) and established interrater reliability. Results: The PASS was positively correlated with the HOME–Rx Performance and Safety subscales; the MedMaIDE was negatively correlated with the HOME–Rx Performance subscale and positively correlated with the Barriers subscale. Interrater reliability was excellent (ICCs = .87–1.00). Conclusions and Relevance: All relationships were as predicted: The HOME–Rx is a valid and reliable performance-based assessment that provides clinicians and researchers with a measure of older adults' actual medication management ability in the home using their medications. The results can potentially be used to guide treatment planning and improve medication management. What This Article Adds: Occupational therapy practitioners can use the HOME–Rx to adequately determine performance problems, safety concerns, and environmental barriers and potentially to guide treatment planning and improve medication management for older adults" (p. 1).
Author	Credentials: OTD

	Position and Institution: Occupational Therapist program at Washington University Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer reviewed journal article Publisher: AOTA
Date and Citation History	Date of publication: 2019 Cited By: 0
Stated Purpose or Research Question	"To further develop the HOME–Rx, an in-home medication management assessment, by modifying scoring metrics, improving clinical utility, and establishing psychometric properties" (p. 1).
Author's Conclusion	"Occupational therapy practitioners can use the HOME–Rx to adequately determine performance problems, safety concerns, and environmental barriers and potentially to guide treatment planning and improve medication management for older adults" (p. 7).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article relates to the EBP question, but it is a very specific assessment to medication management which may not be beneficial for our question. However, the article discusses the prevalence of community-dwelling older adults who are not able to adhere to medication routines.
Overall Quality of Article	Overall Quality of Article: Poor Rationale: This article is not cited anywhere else. It is somewhat difficult to understand the purpose of this article.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Randomized Control Trial
APA Reference	Wong, A. K. C., Wong, F. K. Y., & Chang, K. (2019). Effectiveness of a community-based self-care promoting program for community-dwelling older adults: a randomized controlled trial. *Age & Ageing*, *48*(6), 852–858. https://doi.org/10.1093/ageing/afz095
Abstract	"Background: The existing health care system tends to be focused on acute diseases or patients with high levels of need and is not ideal for meeting the challenges of an ageing population. This study introduced a community-based self-care promoting program for community-dwelling older adults, and tested its effects on maintaining health. Objectives: To determine whether the program can increase self-efficacy, quality of life (QoL), basic and instrumental activities of daily living, and medication adherence, while reducing health service utilization for community-dwelling older adults. Methods: Researchers randomly assigned 457 older adults to receive the intervention (n = 230) or be controls (n = 227). The intervention included assessment and education of self-care and health-promoting behaviors, co-produced care planning and self-efficacy enhancing components supported by a health-social partnership. The control group received placebo social calls. The outcomes were measured at pre-intervention (T1) and three months post-intervention (T2). Results: Analysis showed that the intervention group had a significantly higher score in self-efficacy (P = 0.049), activities of daily living (ADL) (P = 0.012), instrumental activities of daily living (IADL) (P = 0.021) and the physical components of QoL (P < 0.001) at T2 than at T1. The program also significantly improved the mental component of QoL (P < 0.001) and medication adherence (P < 0.001), as well as reducing the total number of health service attendances compared to the control group (P = 0.016). Conclusion: The program can help enhance the self-efficacy of community-dwelling older adults towards self-care, which may in turn enable them to maintain optimal well-being while remaining in the community" (p. 852).
Author	Credentials: From the Nursing Department Position and Institution: Assistant Professor, Nursing department, Hong Kong Polytechnic University Publication History in Peer-Reviewed Journals: Moderate
Publication	Type of publication: scholarly peer-reviewed journal Publisher: Age and Ageing Journal, Oxford University Press Other: British Geriatrics Society
Date and Citation History	Date of publication: 2019 Google Scholar Cited By: 5

Stated Purpose or Research Question	"Objectives: To determine whether the program can increase self-efficacy, quality of life (QoL), basic and instrumental activities of daily living, and medication adherence, while reducing health service utilization for community-dwelling older adults" (p. 852).
Author's Conclusion	"The findings demonstrate that the program enhanced older adults' self-efficacy, QoL, ADL, IADL and medication adherence and reduced their health service utilization. This study provides a reference framework for designing health and social care to promote ageing in place" (pp. 857-858).
Overall Relevance to your EBP Question	Overall Relevance of Article: moderate relevance Rationale: This study developed and implemented a community-based self-care promoting program for community-dwelling older adults. The author found that this program enhanced medication adherence and reduced health service utilization. However, the article does not specify the medication adherence activities participants participated in.
Overall Quality of Article	Overall Quality of Article: good quality Rationale: Reputable journal and publisher. Publication within the last 10 years. The author has a moderate publication history.

	Overview of Article
Type of article	Overall Type: Primary research study Specific Type: Mixed-methods study
APA Reference	Al-Ganmi, A. H. A., Perry, L., Gholizadeh, L., Alotaibi, A. H. (2017). Behaviour change interventions to improve medication adherence in patients with cardiac disease: Protocol for a mixed methods study including a pilot randomised controlled trial. *Australian College of Nursing, 25*(4), 385-394. https://doi.org/10.1016/j.colegn.2017.10.003.
Abstract	"Background: Suboptimal adherence to medication increases mortality and morbidity; individually tailored supportive interventions can improve patients' adherence to their medication regimens. Aims: The study aims to use a pilot randomised controlled trial (RCT) to test the hypothesis that a theory based, nurse-led, multi-faceted intervention comprising motivational interviewing techniques and text message reminders in addition to standard care will better promote medication adherence in cardiac patients compared to standard care alone. The pilot study will assess self-reported adherence or nonadherence to cardiovascular medication in patients referred to a cardiac rehabilitation program following hospital admission for an acute cardiac event and test the feasibility of the intervention. The study will examine the role of individual, behavioural and environmental factors in predicting medication nonadherence in patients with CVD. Methods: This is a mixed- methods study including a nested pilot RCT. Twenty-eight cardiac patients will be recruited; an estimated sample of nine patients in each group will be required for the pilot RCT with 80% power to detect a moderate effect size at 5% significance, and assuming 50% loss to follow-up over the six month intervention. Participants will complete a paper-based survey (Phase one), followed by a brief semi-structured interview (Phase two) to identify their level of adherence to medication and determine factors predictive of non-adherence. Participants identified as 'non-adherent' will be eligible for the pilot randomised trial, where they will be randomly allocated to receive either the motivational interview plus text message reminders and standard care, or standard care alone. Discussion: Nurse-led multi-faceted interventions have the potential to enhance adherence to cardiac medications. The results of this study may have relevance for cardiac patients in other settings, and for long-term medication users with other chronic diseases" (p. 385).
Author	Credentials: PhD Nursing, MSc Clinical Nursing, BSc Nursing Position and Institution: University of Technology Sydney Faculty of Health, & University of Baghdad College of Nursing Publication History in Peer-Reviewed Journals: Moderate
Publication	Type of publication: scholarly peer-reviewed journal Publisher: Elsevier Ltd.

	Other: Australian College of Nursing
Date and Citation History	Date of publication: 2017 Cited By: 6
Stated Purpose or Research Question	"Appropriately designed interventions that employ multiple strategies, such as motivational interviewing to encourage behaviour changes and text messaging strategies to reinforce behaviours, are likely to achieve significant increases in medication adherence in cardiac patients" (p. 386).
Author's Conclusion	"Multi-faceted medication adherence interventions comprising motivational interviews and text reminders may improve adherence to cardiac medication regimens by targeting individual behaviour change… findings may support development of further trials of this intervention in out-patient cardiac care settings ahead of translation into routine clinical care" (p. 392).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: The results support two good interventions for medication adherence; however, the study specifically focuses on patients in a cardiac rehabilitation program instead of looking at the population of older adults. In addition, the conclusion seemed to focus on the idea of further research being needed as it did not include actual results from the study. It was simply explaining the protocol for the study.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Overall, the quality of the article was moderate as it explained protocol for the mixed-methods study and included validity of study instruments.

	Overview of Article
Type of article	Overall Type: Primary research study Specific Type: Double-blind randomized controlled trial
APA Reference	Chan, P., Chang, W., Chiu, H., Kao, C., Liu, D., Chu, H., & Chou, K. (2019). Effect of interactive cognitive-motor training on eye-hand coordination and cognitive function in older adults. *BMC Geriatrics*, *19*(1), 27. https://doi.org/10.1186/s12877-019-1029-y
Abstract	"Abstract Background: Poor eye–hand coordination is associated with the symptoms of the early stage of cognitive decline. However, previous research on the eye–hand coordination of older adults without cognitive impairment is scant. Therefore, this study examined the effects of interactive cognitive-motor training on the visual-motor integration, visual perception, and motor coordination sub-abilities of the eye–hand coordination and cognitive function in older adults. Methods: A double-blind randomized controlled trial was conducted with older adults. Sixty-two older adults were randomly assigned to the experimental (interactive cognitive-motor training) or active control (passive information activity) group, and both groups received 30 min of training each week, three times a week for 8 weeks. The primary outcome was eye–hand coordination, which was further divided into the sub-abilities of visual–motor integration, visual perception, and motor coordination. The secondary outcome was cognitive function. The generalized estimating equation was used to examine differences in immediate posttest, 3-month posttest, and 6- month posttest results between the two groups. Additionally, the baseline effect sizes were compared with the effect sizes of the immediate posttest, 3-month posttest, and 6-month posttests for the experimental group. Results: There were no statistically significant differences between the intervention and control groups. The only statistically significant difference between the groups was in the attention dimension of cognitive function (p = 0. 04). The visual–motor integration results showed a small to moderate effect size for pre post comparisons. Conclusions: The 24 sessions of interactive cognitive-motor training showed no difference to an active control intervention. In the future, this intervention could be further investigated to establish whether it can be superior to an active control group in other populations. Trial registration: The study protocol has been published on Chinese Clinical Trial Registry (ChiCTR) (registry no.: ChiCTR-IOR-14005490). Keywords: Cognitive-motor training, Eye-hand coordination, Older adults, Cognitive function, Randomized control trial" (p. 1).
Author	Credentials: From the Nursing Department Position and Institution: Department of Nursing, En Chu Kong Hospital, Taipei, Taiwan. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Open-access peer-reviewed research journal Publisher: BMC Geriatrics
Date and Citation History	Date of publication: 2019 Cited By: 6
Stated Purpose or	"The primary hypothesis of this study is that older adults who completed ICMT [interactive cognitive motor training] would show greater improvements on older

Research Question	adults' VMI [visual-motor integration], VP [visual perception], and MC [motor coordination] sub-abilities of EHC [eye-hand coordination] when compared with an active control group. The secondary hypothesis of this study is that older adults who completed ICMT would show greater improvements on older adults' cognitive function when compared with an active control group" (p. 3).
Author's Conclusion	"The study intervention improved the score of VMI and showed a small to moderate effect size of the experimental group" (p. 7). "The study intervention improved the score of VP and showed a small effect size in the experimental group… The study intervention showed moderate to large effect sizes and maintain the score for the MC of the experimental group… Although the intervention of the present study was effective for the experimental group, the statistically difference between the experimental and active control groups of VMI, VP and MC could not be obtained" (p. 8).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: Our EBP question states that cognitive interventions are not favored to promote health management/medication management, and this entire study focuses on cognitive interventions. However, the cognitive interventions do have a purpose, and they show to improve some hand-eye coordination and visual-perception skills, which would improve medication adherence. I am not sure this intervention would be able to be generalized very well to medication management, however.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: No statistical differences between the intervention and cognitive groups could be determined or measured. Otherwise, the study was randomized, which helps to ensure validity.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Cross-sectional study using retrospective data
APA Reference	Pathak, S., Haynes, M., Qato, D.M., & Urick, B.Y. (2020). Telepharmacy and quality of medication use in rural areas, 2013-2019. *Preventing Chronic Disease, 15*. http://dx.doi.org/10.5888/pcd17.200012
Abstract	"Introduction: Pharmacy closures in rural areas is an increasingly common problem. Closures disrupt medication access and decrease adherence to prescription medications. Telepharmacy is a potential solution to this problem; however, research on the relationship between telepharmacy and the quality of medication use is scarce. Our study sought to address this gap by comparing the quality of telepharmacies serving rural areas and traditional pharmacies that support them. Methods: We obtained dispensing data for the first 18 months of operation from 3 telepharmacies and 3 traditional pharmacies located in the upper Midwest. We evaluated adherence for noninsulin diabetes medications, renin-angiotensin system antagonists, and statins, as well as inappropriate use of high-risk medications in older adults and statin use in persons with diabetes. All metrics were calculated using Medicare Part D specifications. We estimated the differences between telepharmacies serving rural areas and traditional pharmacies using generalized linear regression. We adjusted our models for potential sociodemographic and clinical confounders. Results: A total of 2,832 patients contributed 4,402 observations to the quality measures. After covariate adjustment, we observed no significant differences between telepharmacies and traditional pharmacies for noninsulin diabetes medications, renin-angiotensin system antagonists, statins, and high-risk medications. However, statin use in persons with diabetes was higher in telepharmacies than traditional pharmacies. Conclusion: We found that the quality of medication use at telepharmacies that serve rural areas was no worse than at traditional pharmacies. For communities considering the adoption of telepharmacy, results indicate that telepharmacies provide a suitable solution for expanding medication access and that using telepharmacy would not negatively affect the quality of medication use" (p. 1).
Author	Credentials: MPH & PhD Position and Institution: Research Associate in Health Services Research at University of North Carolina Eshelman School of Pharmacy, Chapel Hill, North Carolina Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Peer-reviewed public health journal Publisher: Center for Disease Control and Prevention Other: Established by National Center for Chronic Disease Prevention and Health Promotion
Date and Citation History	Date of publication: September 3, 2020 Cited By: 6
Stated Purpose or	"The primary objective of our study was to evaluate the relationship between telepharmacy services in rural areas and the quality of medication use" (p. 2).

Research Question	
Author's Conclusion	"We found that the quality of medication use at telepharmacies that serve rural areas was no worse than at traditional pharmacies. For communities considering the adoption of telepharmacy, results indicate that telepharmacies provide a suitable solution for expanding medication access and that using telepharmacy would not negatively affect the quality of medication use" (p. 1).
Overall Relevance to your EBP Question	Overall Relevance of Article: Poor Rationale: This study addresses medication management in rural populations, but not specifically the aging population in community settings. On top of that, there are not many older adult communities located in rural settings.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article had a large sample size and the authors had good credentials. It is a relevant study as telehealth is becoming more prevalent and may be able to improve the health of those who live away from medical centers or pharmacies or of those who cannot transport to those settings.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Qualitative study
APA Reference	Holt, E.W., Rung, A.L., Leon, K.A., Firestein, C., & Krousel-Wood, M. (2014). Medication adherence in older adults: A qualitative study. *Educational Gerontology, 40*, 198-211. https://doi.org/10.1080/03601277.2013.802186
Abstract	"To effectively address medication adherence and improve cardiovascular health among older adults, a deeper understanding is needed of the barriers that this age group faces and of approaches that would be most effective and feasible for improving adherence. We conducted a focus group study (n = 25) in a diverse population of older adults with hypertension recruited from the Cohort Study of Medication Adherence in Older Adults (CoSMO). A structured guide was used to collect feedback on barriers to adherence and acceptability and the feasibility of intervention strategies. The final coding framework outlines factors at the individual, relationship, health care system, and environmental or policy level that affect adherence in older adults. These include memory, knowledge, attitudes and beliefs, side effects, social support, interaction with healthcare providers, and cost and convenience of medication filling. Patient responses highlighted the varied nature of barriers and the need for interventions that are both multifaceted and tailored" (no page number, abstract only shown on webpage and not in PDF of article).
Author	Credentials: PhD, MPH Position and Institution: Senior Epidemiologist, Center for Health Research. Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: scholarly peer-reviewed journal Publisher: Educational Gerontology Journal Other: Routledge Taylor & Francis Group
Date and Citation History	Date of publication: 2013 Cited By: 46
Stated Purpose or Research Question	"Further qualitative research is needed to understand which strategies are most acceptable for improving adherence among populations of older adults who have health insurance and access to medical care. To fill this gap, we conducted a focus group study in a diverse population of insured older adults to investigate barriers to medication adherence and gain feedback on acceptable intervention strategies" (p. 199).
Author's Conclusion	"In conclusion, this study documents the perspectives of insured older adults with hypertension regarding perceived barriers to, and facilitators of, medication adherence. Participants provided feedback on barriers that could be effectively addressed by carefully designed intervention strategies" (p. 209).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This study provided feedback from older adults on barriers to medication adherence and possible strategies for intervention. Focused on older adults but not on cognitive impairment or decline. Instead it focused on medication adherence in older adults with hypertension.

Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Reputable journal and publisher. Publication within the last 10 years. Well established author.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Qualitative interpretive phenomenological study
APA Reference	Blum, J., Fogo, J., & Malek-Ismail, J. (2018). Medication management in home health care occupational therapy practice. *Open Journal of Occupational Therapy, 6*(4), 1-18. https://doi.org/10.15453/2168-6408.1466.
Abstract	"Background: Many community-dwelling adults do not adhere to their medication regimen, which results in high rates of emergency department visits and subsequent hospital admissions. Occupational therapists, as members of the home health care team, provide medication management in the occupational therapy scope of practice. There is sparse information in the literature regarding occupational therapists' involvement in medication management in home health care practice. Methods: The researchers interviewed nine occupational therapists practicing in home health care. Using a qualitative interpretive phenomenological study, the researchers explored the participants' experiences addressing medication management. Results: The researchers identified three themes: professional reasoning, interprofessional involvement, and professional competence and confidence. The participants reported that they were addressing medication management in accordance with occupational therapy scope of practice; however, they did not feel confident because of their lack of knowledge about pharmacology. Conclusion: Preparing entry-level occupational therapy students and practicing occupational therapists with interprofessional education about medication management will improve occupational therapists' competence and confidence. Occupational therapists who know their role in medication management and are well-informed about medication can collaborate with the home health care team more effectively" (no page number listed, but on the page prior to p. 1).
Author	Credentials: DHSc, OTR/L Position and Institution: University of Indianapolis, no position mentioned Publication History in Peer-Reviewed Journals: moderate
Publication	Type of publication: scholarly peer-reviewed and open-access journal Publisher: The Open Journal of Occupational Therapy Other: The American Journal of Occupational Therapy
Date and Citation History	Date of publication: 2018 Cited By: 1
Stated Purpose or Research Question	"The purpose of this phenomenological qualitative study was to explore occupational therapists' experiences with medication management in HHC. Understanding occupational therapists' experiences of working with HHC clients to manage their medications will provide useful information to develop appropriate medication management guidelines and competency standards to improve overall occupational therapy in HHC practice" (p. 1).

Author's Conclusion	"The therapists in this study relied on professional reasoning to decide how to intervene in medication management, but many reported that they lacked confidence in their ability to address medication management. This lack of confidence was due to their expressed decreased ability to use scientific reasoning to contribute to the professional reasoning necessary to make informed decisions about the most appropriate intervention. It is essential to prepare entry-level occupational therapists for their future role in medication management and to educate occupational therapy practitioners in their current role in medication management" (p. 16).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This study examined occupation therapists' roles in medication management and identified areas of concern for therapists. It is important to take the occupational therapist's confidence and competency into consideration when providing medication management interventions. However, this study focused on home-health care and not primary care.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Reputable journal and publisher. Publication within the last 10 years. Somewhat established author.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Thorne's qualitative methodology, interpretive description
APA Reference	Ploeg, J., Canesi, M., Fraser, K.D., McAiney, C., Kaasalainen, S., Markle-Reid, M., Dufouor, S., Garland Baird, L., & Chambers, T. (2019). Experiences of community-dwelling older adults living with multiple chronic conditions: a qualitative study. *BMJ Open, 9*(3), 1-9. https://doi.org/10.1136/bmjopen-2018-023345
Abstract	"Objectives: The aim of the study was to understand the experiences of living with multiple chronic conditions (MCC) from the perspective of community-living older adults with MCC. Design: A qualitative study using an interpretive description approach. Setting: Participants were recruited from southern Ontario, Canada. Participants: 21 community-living, older adults (≥65 years) with an average of 7.4 chronic conditions including one of diabetes, dementia or stroke. Methods: Data were collected through digitally-recorded, in-depth, semi-structured in-person interviews. Interview transcripts were analysed and coded using Thorne's interpretive description approach. Results: Five themes were identified representing older adults' experiences of living with MCC: (a) trying to stay healthy while living with MCC, (b) depending on family caregivers for support with just about everything, (c) paying the high costs of living with MCC, (d) making healthcare decisions by proxy and (e) receiving healthcare services that do not address the complex needs of persons living with MCC. Conclusions: The experience of living with MCC in the community was complex and multi-faceted. The need for a person-centered and family-centered approach to care in the community, which includes the coordination of health and social services that are tailored to the needs of older adults and their informal caregivers, was underscored. Such an approach would facilitate improved information-sharing and discussion of care management options between health professionals and their patients, enable older adults with MCC to actively engage in priority-setting and decision-making and may result in improved health and quality of life for older adults with MCC" (p. 1).
Author	Credentials: PhD in Nursing, MSN, BSN, RN Position and Institution: Professor emeritus at the School of Nursing and Scientific Director of the Aging, Community and Health Research Unit at McMaster University Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Open access, open peer review, continuous publication Publisher: BMJ Publishing Group Other: Authors are asked to pay article-publishing charges on acceptance

Date and Citation History	Date of publication: February 13, 2019 Cited By: 15
Stated Purpose or Research Question	"What are the experiences of living with MCC from the perspective of older adults residing in the community?" (p. 2)
Author's Conclusion	"The need for a person-centred and family-centred approach to care in the community, which includes the coordination of health and social services that are tailored to the needs of older adults and their informal caregivers, was underscored. Such an approach would facilitate improved information sharing and discussion of care management options between health professionals and their patients, enable older adults with MCC to actively engage in priority-setting and decision-making and may result in improved health and quality of life for older adults with MCC" (p. 1).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article discusses the experiences of older adults in community-dwelling settings which is relevant to our article. These older adults also have multiple chronic conditions which is typically the population that is relevant when discussing medication management. However, this article does not address medication management specifically. The conclusion does not provide further answers for our research question.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The article is strong because the researchers have good credentials and background knowledge. It also has been cited a few times. However, this article was published prior to COVID which plays a large role in the community setting now. This article also has a small sample size.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Qualitative descriptive study
APA Reference	Valaitis, R., Cleghorn, L., Ploeg, J., Risdon, C., Mangin, D., Dolovich, L., Agarwal, G., Oliver, D., Gaber, J., & Chung, H. (2020). Disconnected relationships between primary care and community-based health and social services and system navigation for older adults: A qualitative descriptive study. *BMC Family Practice, 21*, 1-11. http://dx.doi.org/10.1186/s12875-020-01143-8
Abstract	"Background: There are gaps in knowledge and understanding about the relationships between primary care and community-based health and social services in the context of healthy aging at home and system navigation. This study examined provider perspectives on: a) older adults' health and social needs; b) barriers to accessing services; c) the nature of relationships between primary care and health and social services; and d) ways to facilitate primary care and health and social services navigation to optimize older adults' health. Methods: Four focus groups were conducted involving providers ($n = 21$) in: urban primary care clinics and health and social services organizations serving older adults in Hamilton, Ontario, Canada. Purposive sampling was employed to recruit community health and social services managers, directors or supervisors and primary health care providers in a Family Health Team via email. Results: Health and social services needs were exacerbated for community-dwelling older adults with multiple chronic conditions. Strong family/caregiver social support and advocacy was often lacking. Access barriers for older adults included: financial challenges; lack of accessible transportation; wait times and eligibility criteria; and lack of programs to address older adults' needs. Having multiple providers meant that assessments among providers and older adults resulted in contradictory care pathways. Primary care and health and social services linkages were deficient and complicated by poor communication with patients and health literacy barriers. Primary care had stronger links with other health services than with community-based health and social services; primary care providers were frustrated by the complex nature of health and social services navigation; and care coordination was problematic. Health and social services referred older adults to primary care for medical needs and gathered patient information to gauge program eligibility, but not without challenges. Conclusions: Results point to strategies to strengthen primary care and health and social services system navigation for older adults including: using a person-focused approach; employing effective primary care and health and social services communication strategies; applying effective system navigation; building trust between primary care and health and social services providers; advocating for improved program access; and adapting services/programs to address access barriers and meet older adults' needs" (p. 1).
Author	Credentials: BScN, BA, MHSc, PhD

	Position and Institution: Professor emeritus at McMaster School of Nursing, Scientific director of Aging, Community, and Health Unit. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Open-access, peer-reviewed journal Publisher: Springer Nature Other: Article-processing charge for publication
Date and Citation History	Date of publication: April 23, 2020 Cited By: 6
Stated Purpose or Research Question	"1. What do primary care and HSS providers perceive are common health and social service needs, barriers in accessing primary care and HSS, and service gaps experienced by community-dwelling older adults? 2. What is the nature of relationships between primary care and HSS? 3. What system navigation strategies do primary care and HSS providers use to support older adults to access services?" (p. 3)
Author's Conclusion	"Community-living older adults with MCC experience needs that could be addressed, at least in part, by integrated primary care and HSS services. Much needs to be done to create a well-coordinated, integrated system that supports not only optimal aging of older adults, but collaborative working relationships of primary care and HSS providers. Further research is needed to identify which approaches are most effective" (p. 9).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article demonstrates the need for different strategies among primary care providers and service providers in community settings. It gives the practitioner perspective on collaborating to provide care, but does not provide the older adult perspective.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: It provides information on current primary care and service provider practices. It addresses where the gaps are, but the sample size is small. The author is very well credentialed. It has been cited very few times. It provides good background, but does not answer the overall EBP question

	Overview of Article
Type of article	Overall Type: Primary research study Specific Type: Quasi-experimental with pretest and posttest
APA Reference	Chang, L.-H., Chen, P.-Y., Wang, J., Shih, B.-H., Tseng, Y.-H., & Mao, H.-F. (2021). High-ecological cognitive intervention to improve cognitive skills and cognitive–functional performance for older adults with mild cognitive impairment. *American Journal of Occupational Therapy, 75*, 7505205050. https://doi.org/10.5014/ajot.2021.041996
Abstract	"Importance: Evidence of the effectiveness of cognitive activity and preparatory tasks in improving the cognitive skills and functional performance of people with cognitive decline is limited. Objective: To examine the efficacy of a high-ecological cognitive intervention. Design: Quasi-experimental, pretest-posttest design with nonequivalent control. Setting: Community. Participants: Older adults with mild cognitive impairment from two senior centers. Intervention: Twelve 90-min weekly group sessions of a high-ecological cognitive intervention using simulated everyday cognitive tasks (experimental group) and of nutrition education (active control group). Outcomes and Measures: Cognitive skills were measured with the Color Trails Test (CTT), the Contextual Memory Test (CMT; Immediate Recall [CMT-Im] and Delayed Recall [CMT-De] tasks), and the Wechsler Adult Intelligence Scale-Fourth Edition Digit Span subtest (Digits Forward and Digits Backward). Cognitive-functional performance was measured with the Rivermead Behavioural Memory Test-Third Edition (RBMT-3; Immediate Recall [RBMT-3-Im] and Delayed Recall [RBMT-3-De] tasks) and the Cognitive Failures Questionnaire (CFQ). Results: Thirty-seven participants (M age = 70.84 yr; 70.3% women) met the inclusion criteria for analysis (20 participants in the intervention group, 17 participants in the control group). Multivariate linear regression showed that the intervention group improved significantly more than the control group on the CTT, CMT-Im, and RBMT-3-Im but not on the CMT-De, RBMT-3-De, and CFQ. Conclusions and relevance: Twelve 90-min weekly group sessions of a high-ecological cognitive intervention improved attention, executive function, immediate memory, and objective cognitive-functional performance with immediate-memory task demands. What This Article Adds: Carefully designed and structured simulated everyday cognitive tasks can be used as a cognitive training agent to improve both cognitive skills and objective cognitive-functional performance. The effectiveness of group-

	based cognitive interventions depends on the skills of occupational therapy practitioners in activity analysis and grading" (p.1).
Author	Credentials: PhD Position and Institution: Associate Professor, Department of Occupational Therapy and Institute of Allied Health Sciences, College of Medicine, National Cheng Kung University, Tainan, Taiwan. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: American Journal of Occupational Therapy
Date and Citation History	Date of publication: 2021 Cited By: 0
Stated Purpose or Research Question	"We hypothesized that when simulated everyday cognitive tasks were used as an intervention medium in cognitive training, both cognitive skills and cognitive–functional performance would improve" (p. 2).
Author's Conclusion	"We conclude that carefully designed and structured simulated everyday cognitive tasks can be used as a cognitive training agent to improve both cognitive skills and objective cognitive–functional performance" (p. 5).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: Although the results showed evidence of the population in the EBP question being measured and results concluding improvement of cognition after cognitive interventions (with a purpose), it did not directly correlate to medication management. I am not sure if the interventions described would benefit someone with cognitive decline trying to improve medication adherence. I think it focused more on how to improve cognition, but results were not solid enough to translate this learning into improvement of medication adherence.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Lots of descriptive statistics were used (a two-way ANOVA), which helped improve the validity of the study.

	Overview of Article
Type of article	Overall Type: Primary research study Specific Type: Qualitative, interview
APA Reference	Doucette, W.R., Vinel, S., & Pennathur, P. (2017). Initial development of the Systems Approach to Home Medication Management (SAHMM) model. *Research in Social and Administrative Pharmacy*, *13*, 39-47. https://doi.org/10.1016/j.sapharm.2015.12.013
Abstract	"Background: Adverse drug events and medication nonadherence are two problems associated with prescription medication use for chronic conditions. These issues often develop because patients have difficulty managing their medications at home. To guide patients and providers for achieving safe and effective medication use at home, the Systems Approach to Home Medication Management (SAHMM)model was derived from a system engineering model for health care workplace safety. Objective: To explore how well concepts from the SAHMM model can represent home medication management by using patient descriptions of how they take prescription medications at home. Methods: Twelve patients were interviewed about home medication management using an interview guide-based on the factors of the SAHMM model. Each interview was audio-taped and then transcribed verbatim. Interviews were coded to identify themes for home medication management using MAXQDA for Windows. Results: SAHMM concepts extracted from the coded interview transcripts included work system components of person, tasks, tools & technology, internal environment, external environment, and household. Concepts also addressed work processes and work outcomes for home medication management. Conclusions: Using the SAHMM model for studying patients' home medication management is a promising approach to improving our understanding of the factors that influence patient adherence to medication and the development of adverse drug events" (p. 39).
Author	Credentials: PhD, FAPhA, RPh Position and Institution: University of Iowa Professor of Pharmacy Practice and Science Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: publishes monthly/twelve times per year, featuring original scientific reports, comprehensive review articles, proposed models, and provocative commentaries in the social and administrative pharmaceutical sciences. Publisher: Research in Social and Administrative Pharmacy
Date and Citation History	Date of publication: 2017 Cited By: 9
Stated Purpose or Research Question	"The purpose of this study was to operationalize a Systems Approach to Home Medication Management (SAHMM) model for a comprehensive and informative representation of factors affecting patients who manage medications in their homes. The specific objective of this pilot study was to explore how well concepts from the SAHMM model can represent home medication management by using patient descriptions of how they take prescription medications" (p. 41).

Author's Conclusion	"The SAHMM model is a promising option for taking a systematic approach to studying patients' home medication management. Continued research is needed to operationalize the model into tools that can be used by health care providers for the purpose of improving patient outcomes relating to medication nonadherence and adverse drug events" (p. 46).
Overall Relevance to your EBP Question	Overall Relevance of Article: Poor Rationale: Factors affecting medication adherence were identified through interviews. However, interventions to improve adherence were not identified. Interventions are the main focus of our research study, therefore the study does not match the aim of our research specifically. More research is needed on the SAHMM model to discover if its concepts can be applied to practice.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The article is a good study if one is looking at the factors that relate to medication adherence. It is personal as it involves qualitative information.

	Overview of Article
Type of article	Overall Type: Primary research study Specific Type: Phase I blinded randomized controlled trial
APA Reference	Schwartz, J., & Smith, R. (2016). Intervention promoting medication adherence: A randomized, phase I, small-n study. *American Journal of Occupational Therapy*, 70(6), 1-11. https://doi.org/10.5014/ajot.2016.021006
Abstract	"Objectives: We sought to define an occupational therapy intervention to promote medication management and to evaluate the acceptability and effectiveness of the intervention. Method: Nineteen adults with chronic health conditions and poor medication adherence participated in a two-group, blinded, randomized study. They received either an occupational therapy or a standard care intervention. We used a qualitative method to measure participants' changes in medication management through an interview regarding participants' perceptions and behaviors. Results: The occupational therapy intervention group reported greater improvements in medication management and implemented twice as many new adaptive strategies as the standard care group. Participants indicated that interventions related to advocacy, education, assistive technology, environmental modifications, self-monitoring, and good rapport were the active ingredients of the intervention. Conclusions: Occupational therapy is an acceptable intervention for medication management, and it can lead to self-perceived improvements and the adoption of new medication management behaviors. Further research is warranted" (p. 1).
Author	Credentials: PhD, OTR/L Position and Institution: Assistant Professor, Department of Occupational therapy, Nicole Wertheim College of Nursing and Health Sciences, Florida International University, Miami Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal
Date and Citation History	Date of publication: 2017 Cited By: 6
Stated Purpose or Research Question	"To test our hypothesis, we began with a Phase I study. The goals of a Phase I study are to define the intervention and evaluate its acceptability, feasibility, and safety (Gitlin, 2013). This project had three objectives: (1) evaluate the acceptability of the intervention, (2) understand whether the intervention is effective enough to warrant future research, and (3) define the intervention. Feasibility and safety have been discussed elsewhere (Schwartz, 2015; Schwartz & Smith, 2017)" (p. 2).
Author's Conclusion	"Similar to SCIG participants, the OTIG participants reported that the intervention helped them become more aware of their medication routine, better self-monitor their adherence, and feel validated about their current routines" (p. 7).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: The article is relevant to occupational therapy as well as each aspect of our EBP question. I enjoyed how it explained the different aspects of the OT intervention, which included goal setting, motivational interviewing, activity modification,

	advocacy, education, assistive technology, environmental modifications, and refill discussions. However, refills, activity modification, and goal setting did not yield relevant results.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: More research is needed with a greater quantity of participants. Only 19 were used in this study. However, implications for future research was included in the study, which was beneficial for the study's findings.

	Overview of Article
Type of article	Primary Research Study Specific Type: Qualitative study using semi-structured interviews
APA Reference	El-Saifi, N., Moyle, W., & Jones, C. (2019). Family caregivers' perspectives on medication adherence challenges in older people with dementia: a qualitative study. *Aging & Mental Health, 23*(10), 1333–1339. https://doi.org/10.1080/13607863.2018.1496226
Abstract	"Objectives: To achieve a better understanding of medication non-adherence determinants in older people with dementia from caregivers' perspectives and possible management solutions to improve medication adherence. Method: Semi-structured telephone interviews were conducted with 20 caregivers of older people with dementia living in the community. Data was analyzed using an inductive thematic analysis based on Braun and Clarke's method. Findings: Four themes emerged: dementia symptoms influence medication adherence, medication increases caregiver burden, lack of self-efficacy, medication aids and technology to enhance medication adherence. Caregivers' lack of knowledge reduces their self-efficacy in managing medications and increases their burden of care. The majority of caregivers used technology and welcomed its use to assist them with their role. Conclusion: Caregivers require knowledge and support such as a multifaceted technology based intervention to assist with medication adherence" (p. 1333).
Author	Credentials: BPharm, MSc, PhD Position and Institution: Doctor of Philosophy at Griffith University Publication History in Peer-Reviewed Journals: moderate
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Taylor & Francis Group
Date and Citation History	Date of publication: 2019 Google Scholar Cited By: 4
Stated Purpose or Research Question	"The aim of this study was to achieve a better understanding of the determinants of medication non-adherence in caregivers of people with dementia and possible solutions that can be translated into technological interventions to improve medication adherence in this population" (p. 1333-1334).
Author's Conclusion	"To ensure safe and quality use of medications for people with dementia, family caregivers should be fully equipped for such a significant role by providing them with the required knowledge and support to overcome these challenges through a multifaceted approach. Technologies are powerful tools to deliver such approach considering its effectiveness affordability and ease of use" (p. 1338).
Overall Relevance to	Overall Relevance of Article: Moderate Rationale: The article is related to medical adherence challenges that older adults face from the perspective of their caregivers, which can be useful for our case to understand

your EBP Question	barriers to medication management. This article also addresses the role of caregivers in medication management.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Established author. Reputable journal and publisher. Publication within the last 5 years.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Survey research
APA Reference	Lam, P., Elliott, R.A., & George, J. (2011). Impact of a self-administration of medications programme on elderly inpatients' competence to manage medications: a pilot study. *Journal of Clinical Pharmacy & Therapeutics*, *36*(1), 80–86. https://doi.org/10.1111/j.1365-2710.2009.01157.x
Abstract	"What is known and objectives: Changes to medication regimens and failure to involve patients in management of their medications whilst in hospital may result in medication errors or nonadherence at home after discharge. Self-administration of medications programmes (SAMP) have been used to address this issue. The objective of this study was to assess the impact of a SAMP on elderly hospital inpatients' competence to manage medications and their medication adherence behaviours. Methods: The SAMP comprised three stages: education, progressing to supervised self-administration and finally to independent self-administration. Decisions to progress patients to the next level, and whether they passed or failed the SAMP, were made by the ward pharmacist and nursing staff. The Drug Regimen Unassisted Grading Scale (DRUGS) was used to assess patients' competence to manage medications at various time points. Tablet count and the Tool for Adherence Behaviour Screening (TABS) were used as adherence measures. Results and discussion: Participants (n = 24) with a mean age of 77Æ4 years, were mainly female and generally had a high level of functioning. They were prescribed a mean of 9Æ0 medications at the time of commencing the SAMP. Twenty-two of the 24 participants successfully completed the SAMP. DRUGS scores at discharge improved significantly (P < 0Æ001) compared with that before commencement of medication self-administration. Participants reported a significant decrease (P = 0Æ02) in non-adherent behaviour and a trend towards improved adherent behaviour (P = 0Æ08) after participation in the SAMP. What is new and conclusion: An inpatient SAMP improved elderly patients' ability to competently manage and adhere to their prescribed medications regimen. This finding needs to be confirmed in a larger controlled trial" (p. 80).
Author	Credentials: PhD Position and Institution: Professor at Monash University Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Scholarly peer-reviewed journals Publisher: Journal of Clinical Pharmacy and Therapeutics
Date and Citation History	Date of publication: 2011 Google Scholar Cited By: 46

Stated Purpose or Research Question	"The aim of this pilot study was to test the impact of an inpatient SAMP on elderly patients' competence to manage their own medications and medication adherence behaviours" (p. 81).
Author's Conclusion	"An inpatient SAMP may improve elderly patients' ability to competently manage and adhere to their prescribed medication regimen. A SAMP with increasing levels of independence may be a useful addition to medication discharge planning in the aged care rehabilitation setting" (p. 85).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article is directly related to medication management interventions for elderly individuals, but is not directly associated with OT. This article uses an assessment tool to gain a better understanding of an older adult's medication management ability.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Publication within the last 10 years.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Validation Study
APA Reference	Murphy, M. C., Somerville, E., Keglovits, M., Hu, Y.-L., & Stark, S. (2017). In-Home medication management performance evaluation (HOME–Rx): A validity study. *American Journal of Occupational Therapy, 71*(4), 1-7. https://doi.org/10.5014/ajot.2017.022756
Abstract	"Objective: This study assessed the initial psychometric properties of a novel in-home, performance-based instrument for older adults called the In-Home Medication Management Performance Evaluation (HOME–Rx). Method: Content validity of the HOME–Rx was determined through the multistep content validity index (CVI) process. Content experts provided qualitative and quantitative judgment of the instrument's ability to measure medication management. The assessment's target population provided qualitative feedback. CVI outcomes informed instrument revisions. Results: Content experts (n 5 7) were in agreement that the overall instrument was valid for measuring medication management (scale-level CVI 5 .95). Six items were deleted because of low agreement (item level CVI <.80). Twenty-nine minor edits were made to the order of questions and language. Older adult participants (n 5 5) reported the instrument was relevant, acceptable, and easy to understand. Conclusion: The HOME–Rx appears to be a relevant and valid method to assess performance barriers to medication management in the home" (p. 1).
Author	Credentials: OTD, OTR/L Position and Institution: Occupational Therapist, University of California, San Francisco Medical Center and the California Pacific Medical Center. At the time of the study, she was Doctoral Student, Program in Occupational Therapy, Washington University School of Medicine, St. Louis, MO Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Scholarly peer-reviewed journals Publisher: American Journal of Occupational Therapy Other:
Date and Citation History	Date of publication: 2017 Google Scholar Cited By: 5
Stated Purpose or Research Question	"The purpose of this study was to develop a novel, performance-based medication adherence assessment, the In-Home Medication Management Performance Evaluation (HOME–Rx). The HOME–Rx is intended for use by home health occupational therapists to assess an older adult's ability to manage medication routines in the home and to identify at-risk behaviors" (p. 2).
Author's Conclusion	"The HOME–Rx had strong content validity scores. It could be a relevant and valid instrument that occupational therapists can use in the home to assess performance

	barriers to medication adherence among older adults. The CVI process is a standardized and easy-to-follow method for confirming content validity metrics for assessments, and it should be considered for future use when establishing the initial psychometric properties of assessments" (p. 6).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article directly relates to our research topic because it discusses an evaluation that can be used for in-home education management performance. This can be useful to determine a way in which medication management is measured.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Publication within the last 5 years.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Small-N design, randomized control trial
APA Reference	Schwartz, J. K., & Smith, R. O. (2016). Intervention promoting medication adherence: A randomized, phase I, small-n study. *American Journal of Occupational Therapy, 70*(6), 1-11. https://doi.org/10.5014/ajot.2016.021006
Abstract	"Objective: Many people with chronic health conditions fail to take their medications as prescribed, resulting in declines in health and function. The purpose of this study was to perform a Phase I feasibility study to understand whether an integrated occupational therapy intervention could help people with chronic health conditions improve their adherence to medications. Method: Using a small-N design, we report single-subject analyses of the medication adherence of 11 participants before and after either an occupational therapy intervention or a standard care intervention. We used a multiple baseline approach with intersubject replication and blinding. Results: The occupational therapy intervention was found to decrease performance variability and to increase medication adherence rates in some people with chronic conditions. Conclusion: These findings suggest that an occupational therapy intervention can improve medication adherence in people with chronic health conditions. The intervention tested in this study is feasible and would benefit from further research" (p. 1).
Author	Credentials: PhD, OTR/L Position and Institution: Assistant Professor, Department of Occupational Therapy, Nicole Wertheim College of Nursing and Health Sciences, Florida International University, Miami Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Scholarly peer-reviewed journals Publisher: The American Journal of Occupational Therapy
Date and Citation History	Date of publication: 2016 Google Scholar Cited By: 9
Stated Purpose or Research Question	"The specific purpose of this article is to report the feasibility study results of using a new occupational therapy intervention. Specifically, we posed two research questions: (1) Is an occupational therapy intervention for medication adherence feasible? (2) Does an integrated occupational therapy intervention appear to improve medication adherence in people with chronic health conditions?" (p. 2)
Author's Conclusion	"We found that medication adherence can be receptive to occupational therapy intervention and that it is feasible to conduct research in which occupational therapy intervention is tested. Medication management is a critical life skill for people with

	chronic health conditions, and occupational therapy practitioners have a role on the medication team" (p. 10).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This study is directly related to medication adherence interventions for older adults, which addresses our research question. It is relevant as it targets the same population, but it doesn't address primary care.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Established author. Reputable journal and publisher. Publication within the last 5 years.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Random assignment, correlation analysis
APA Reference	Smith, D., Zheng, R., Metz, A., Morrow, S., Pompa, J., Hill, J., & Rupper, R. (2019). Role of cognitive prompts in video caregiving training for older adults: Optimizing deep and surface learning. *Educational Gerontology*, *45*(1), 45-56. https://doi.org/10.1080/03601277.2019.1580442
Abstract	"Enhancing the cognitive functionality of digital technology can be critical in learning complex topics like caregiving for older adults. This study examines the deployment of cognitive prompts in video-based training to optimize older adults' cognitive information process in both deep and surface learning. The path analysis revealed the relationship among cognitive prompts, crystallized knowledge and learning outcomes showing crystallized knowledge as a significant mediator between cognitive prompts and learning outcomes. Additionally, cognitive prompts were shown to be significant in activating older learners' prior knowledge, rendering the learning process more meaningful and purposeful for older adults" (p. 45).
Author	Credentials: PhD, Counseling Psychology, University of Utah Position and Institution: Research Associate, Educational Psychology, University of Utah Publication History in Peer-Reviewed Journals: Limited
Publication	Type of publication: Peer-reviewed journal Publisher: Educational Gerontology
Date and Citation History	Date of publication: 2019 Cited By: 5
Stated Purpose or Research Question	"This study examines the deployment of cognitive prompts in video-based training to optimize older adults' cognitive information process in both deep and surface learning … The current study aims to study how crystallized knowledge facilitates older adults' performance in domain specific training by looking at the relationship between cognitive prompts, crystallized knowledge and learning outcomes in video-based caregiving training for older adults" (p. 45).
Author's Conclusion	"The correlation analyses showed that there was a significant correlation among Gc [(crystallized intelligence)], cognitive prompts and learning outcomes. It was found that cognitive prompts were significantly correlated with Gc which in turn correlated with its respective learning outcomes, that is, recognition as measured in dementia knowledge videos and transfer in incontinence knowledge videos" (p. 53).

Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article examines cognitive prompts in video training for older adults. It provides good background information on cognition changes in older adults, but this strategy wouldn't necessarily promote medication management.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The sample size was a decent size, with n= 60. Participants were randomly assigned to one of two conditions and completed pre/postintervention surveys.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Participants were assigned by site, pre/postintervention surveys
APA Reference	Whittaker, C.F., Tom, S.E., Bivens, A., & Klein-Schwartz, W. (2017). Evaluation of an educational intervention on knowledge and awareness of medication safety in older adults with low health literacy. *American Journal of Health Education, 48*(2), 100-107. https://doi.org/10.1080/19325037.2016.1271754
Abstract	"Background: Older adults with low health literacy are at increased risk of nonadherence, accidental drug exposure, and adverse events. Purpose: This study evaluated older adults' knowledge and awareness of medication safety and poison prevention resources using an interactive educational game compared to a less intensive intervention involving individual review of brochures. Methods: Both groups were given pre- and postintervention surveys to assess change in knowledge. Participants were followed up at 30 days to assess knowledge retention and behavior changes. Results: A total of 101 older adults participated in the study. In the game group, the median improvement in the index score pre- and postintervention was 3, moving from 9 (interquartile range [IQR] 6, 9) to 11 (IQR 9, 12). The brochure group median improvement was 1, moving from 7.5 (IQR 6, 8) to 8 (IQR 5, 10). Comparing postintervention to 30-day follow-up, over 50% of respondents retained the correct responses. Discussion: The interactive game significantly improved knowledge regarding use of child-resistant cap, interpreting a drug facts label, medication list documentation, and who to call for advice. Translation to Health Education Practice: This educational intervention has potential to increase awareness of poison prevention resources and medication safety strategies in older adults with low health literacy" (p. 100).
Author	Credentials: Doctor of Pharmacy, Rutgers University Position and Institution: Assistant Professor of Pharmacy Practice and Science, University of Maryland School of Pharmacy; Peter Lamy Center on Drug Therapy and Aging Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Peer-reviewed journal Publisher: American Journal of Health Education

Date and Citation History	Date of publication: 2017 Cited By: 8
Stated Purpose or Research Question	"This study hypothesizes that a tailored educational game developed using the NAALS framework will increase knowledge and produce changes in intended behavior in older adults with varying levels of health literacy to a greater extent than receiving comparable information from tailored written patient education. The aims of this study were to (1) evaluate knowledge at baseline and (2) examine the impact of intervention on knowledge and changes in intended behavior in the game group compared to the brochure group at posttest and follow-up telephone call" (p. 101).
Author's Conclusion	"This study found that an interactive educational game led by pharmacist facilitator improved community-dwelling older adults' knowledge of medication safety and poison prevention compared to independent review of a brochure. The game demonstrated improved knowledge regarding use of child-resistant caps, interpreting a drug facts label, keeping herbal and vitamins medication lists, and who to call for advice in the middle of the night to a significantly greater extent than the brochure" (p. 103).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: In this article, the researchers implemented a game-based education strategy to improve knowledge and safety about medication. This relates to our question in that it provides a possible method for educating clients about medication safety, but doesn't necessarily touch on medication management.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article has a good sample size of n= 101. Both groups were given a pre/postintervention assessment, and they were recruited from independent-living senior housing communities and senior centers.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Randomized control, feasibility study
APA Reference	Zárate-Bravo, E.,García-Vázquez, J.P., Torres-Cervantes, E., Ponce, G., Andrade, A.G., Valenzuela-Beltrán, M., & Rodríguez, M.D. (2020). Supporting the medication adherence of older Mexican adults through external cues provided with ambient displays: feasibility randomized controlled trial. *JMIR mHealth and uHealth*, 8(3), 1-17. http://mhealth.jmir.org/2020/3/e14680/
Abstract	"Background: Problems with prospective memory, which refers to the ability to remember future intentions, cause deficits in basic and instrumental activities of daily living, such as taking medications. Older adults show minimal deficits when they rely on mostly preserved and relatively automatic associative retrieval processes. On the basis of this, we propose to provide external cues to support the automatic retrieval of an intended action, that is, to take medicines. To reach this end, we developed the Medication Ambient Display (MAD), a system that unobtrusively presents relevant information (unless it requires the users' attention) and uses different abstract modalities to provide external cues that enable older adults to easily take their medications on time and be aware of their medication adherence. Objective: This study aimed to assess the adoption and effect of external cues provided through ambient displays on medication adherence in older adults. Methods: A total of 16 older adults, who took at least three medications and had mild cognitive impairment, participated in the study. We conducted a 12-week feasibility study in which we used a mixed methods approach to collect qualitative and quantitative evidence. The study included baseline, intervention, and postintervention phases. Half of the participants were randomly allocated to the treatment group (n=8), and the other half was assigned to the control group (n=8). During the study phases, research assistants measured medication adherence weekly through the pill counting technique. Results: The treatment group improved their adherence behavior from 80.9% at baseline to 95.97% using the MAD in the intervention phase. This decreased to 76.71% in the postintervention phase when the MAD was no longer being used. Using a one-way repeated measures analysis of variance and a post hoc analysis using the Tukey honestly significant difference test, we identified a significant statistical difference between the preintervention and intervention phases (P=.02) and between the intervention and postintervention phases (P=.002). In addition, the medication adherence rate of the treatment group (95.97%) was greater than that of the control group (88.18%) during the intervention phase. Our qualitative results showed that the most useful cues were the auditory reminders, followed by the stylized representations of medication adherence. We also found that the MAD's external cues not only

	improved older adults' medication adherence but also mediated family caregivers' involvement. Conclusions: The findings of this study demonstrate that using ambient modalities for implementing external cues is useful for drawing the attention of older adults to remind them to take medications and to provide immediate awareness on adherence behavior" (p. 1).
Author	Credentials: MSc Position and Institution: Faculty of Engineering, Universidad Autónoma de Baja California, Mexicali, Mexico Publication History in Peer-Reviewed Journals: Limited
Publication	Type of publication: Peer-reviewed journal Publisher: JMIR mHealth and uHealth
Date and Citation History	Date of publication: 2020 Cited By: 2
Stated Purpose or Research Question	"Our study aimed to address the following research questions (RQ): RQ1: What is the effect of the external cues provided by the Medication Ambient Display (MAD) on older adults' medication adherence? RQ2: How do the MAD design features promote its adoption?" (p. 2)
Author's Conclusion	"Our quantitative results show that providing the external cues supported by the MAD resulted in significant improvements in the average rates of dosage outcomes for older adult … We found that external cues (1) reminded them to take medications, (2) enabled them to recognize if a medication was recorded as taken, and (3) provided immediate awareness about how they followed their medication regimens" (p. 11).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article provides an intervention for medication management in older adults with mild cognitive impairment that was effective, which helps us answer our question about medication management strategies.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The information in this article was relevant and recent, but the sample size was small (n=16). With only 8 participants in each condition, outliers would easily influence the data and there is more room for error.

	Overview of Article
Type of article	Overall Type: Primary Research Study (qualitative, quantitative, etc.) Specific Type: Exploratory randomized control trial
APA Reference	Zingmark, M., Fisher, A., Rocklov, J., & Nilsson, I. (2014). Occupation-focused interventions for well older people: An exploratory randomized controlled trial. *Scandinavian Journal of Occupational Therapy*, *21*(6), 447–457. https://doi.org/10.3109/11038128.2014.927919
Abstract	"Objective: The aim of this exploratory randomised controlled trial (RCT) was to evaluate three different occupation-focused interventions for well older people by estimating effect sizes for leisure engagement and ability in activities of daily living (ADL) and thereby identifying the most effective interventions. Methods: One hundred and seventy-seven persons, 77–82 years old, living alone and without home help, were randomized to a control group (CG), an individual intervention (IG), an activity group (AG), and a one-meeting discussion group (DG). All interventions focused on occupational engagement and how persons can cope with age-related activity restrictions in order to enhance occupational engagement. Data were collected by blinded research assistants at baseline, three, and 12 months. Ordinal outcome data were converted, using Rasch measurement methods, to linear measures of leisure engagement and ADL ability. Standardized between-group effect sizes, Cohen's d, were calculated. Results: While all groups showed a decline in leisure engagement and ADL over time, the IG and the DG were somewhat effective in minimizing the decline at both three and 12 months. However, the effect sizes were small. Conclusions: The findings indicate that occupation-focused interventions intended to minimize a decline in leisure engagement and ADL were sufficiently promising to warrant their further research" (p. 447).
Author	Credentials: PhD, Active and Healthy Aging, Umeå University Position and Institution: Visiting Researcher, Department of Community Medicine and Rehabilitation, Division of Occupational Therapy, Umeå University Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Peer-reviewed journal Publisher: Scandinavian Journal of Occupational Therapy
Date and Citation History	Date of publication: 2014 Cited By: 46

Stated Purpose or Research Question	"The aim of this exploratory RCT was to evaluate three different interventions focusing on occupational engagement among older people and to estimate effect sizes to identify the most effective interventions. The interventions were an individual intervention (IG), an activity group (AG), and a discussion group (DG). The specific research questions were: What is the effect size for leisure engagement for each of the three interventions? What is the effect size for ADL for each of the three interventions? Which intervention results in the largest effect sizes for leisure engagement and/or ADL?" (p. 448)
Author's Conclusion	"This exploratory trial revealed that short-term interventions that focus on occupational engagement for well older people have some positive effects on both leisure engagement and ADL ability… When the ability to perform ADL is considered, all intervention groups showed long-term trends towards a decreased rate of decline in ADL ability" (p. 454).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article poses possible interventions that are occupation-based, rather than cognitive-based, for older adults. The population of this study lives alone, but the participants do not display cognitive decline.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article had a sample size of n= 177, which makes the article higher quality. They examined different types of interventions (control group, individual intervention, activity group, and a one-meeting discussion group), so we get a good idea of what possible interventions could be effective.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Systematic review
APA Reference	Steinbeisser, K., Schwarzkopf, L., Graessel, E., & Seidl, H. (2020). Cost-effectiveness of a non-pharmacological treatment vs. "care as usual" in day care centers for community-dwelling older people with cognitive impairment: results from the German randomized controlled DeTaMAKS-trial. *European Journal of Health Economics,* 21, 825–844. https://doi.org/10.1007/s10198-020-01175-y
Abstract	"Background: Cognitive impairment in older adults causes a high economic and societal burden. This study assesses the cost-effectiveness of the multicomponent, non-pharmacological MAKS treatment vs. "care as usual" in German day care centers (DCCs) for community-dwelling people with mild cognitive impairment (MCI) or mild to moderate dementia over 6 months. Methods: The analysis was conducted from the societal perspective alongside the cluster-randomized controlled, multicenter, prospective DeTaMAKS-trial with waitlist group design. Outcomes were Mini-Mental Status Examination (MMSE) and Erlangen Test of Activities of Daily Living in Persons with Mild Dementia or Mild Cognitive Impairment (ETAM) of 433 individuals in 32 DCCs. Incremental differences in MMSE and ETAM were calculated via a Gaussian-distributed and incremental cost difference via a Gamma-distributed Generalized Linear Model. Cost-effectiveness was assessed via cost-effectiveness planes and cost-effectiveness acceptability curves (CEAC). Results: At 6 months, MMSE (adjusted mean difference = 0.92; 95% confidence interval (CI): 0.17 to 1.67; $p = 0.02$) and ETAM (adjusted mean difference = 1.00; CI: 0.14 to 1.85; $p = 0.02$) were significantly better in the intervention group. The adjusted cost difference was − €938.50 (CI: − 2733.65 to 763.13; $p = 0.31$). Given the CEAC, MAKS was cost-effective for 78.0% of MMSE and 77.4% for ETAM without a need for additional costs to payers. Conclusions: MAKS is a cost-effective treatment to stabilize the ability to perform activities of daily living and cognitive abilities of people with MCI or mild to moderate dementia in German DCCs. Thus, MAKS should be implemented in DCCs" (p. 825).
Author	Credentials: B.Sc., MPH Position and Institution: Institute of Health Economics and Health Care Management, Helmholtz Zentrum München, German Research Center for Environmental Health Publication History in Peer-Reviewed Journals: Limited
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: The European Journal of Health Economics
Date and Citation History	Date of publication: 2020 Cited By: 5

Stated Purpose or Research Question	"The objective of this study is to assess the cost-effectiveness of a multicomponent, non-pharmacological treatment vs. "care as usual" in DCCs for community-dwelling people with cognitive impairment from the societal perspective" (p. 827).
Author's Conclusion	"In conclusion, our results emphasize that the non-pharmacological treatment MAKS is a cost-effective intervention to stabilize the ability to perform ADLs and the cognitive abilities of people with MCI or mild to moderate dementia in German DCCs" (p. 841).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article uses older adults who have cognitive decline. However it doesn't look specifically at how this treatment impacts medication management.
Overall Quality of Article	Overall Quality of Article: Good-moderate Rationale: Fairly established authors, reputable journal and publisher, publication within the last 2 years, however it has only been cited by 5 articles (this may be due to it being so recent).

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Randomized, single-blind study
APA Reference	Hampstead, B. M., Sathian, K., Phillips, P. A., Amaraneni, A., Delaune, W. R., & Stringer, A. Y. (2012). Mnemonic strategy training improves memory for object location associations in both healthy elderly and patients with amnestic mild cognitive impairment: A randomized, single-blind study. *Neuropsychology, 26*(3), 385-399. http://dx.doi.org/10.1037/a0027545
Abstract	"Objective: To evaluate the efficacy of mnemonic strategy training versus a matched-exposure control condition and to examine the relationship between training-related gains, neuropsychological abilities, and medial temporal lobe volumetrics in patients with amnestic mild cognitive impairment (aMCI) and age-matched healthy controls. Method: Twenty-three of 45 screened healthy controls and 29 of 42 screened patients with aMCI were randomized to mnemonic strategy or matched-exposure groups. Groups were run in parallel, with participants blind to the other intervention. All participants completed five sessions within 2 weeks. Memory testing for object−location associations (OLAs) was performed during sessions one and five and at a 1-month follow-up. During Sessions 2–4, participants received either mnemonic strategy training or a matched number of exposures with corrective feedback for a total of 45 OLAs. Structural magnetic resonance imaging was performed in most participants, and medial temporal lobe volumetrics were acquired. Results: Twenty-one healthy controls and 28 patients with aMCI were included in data analysis. Mnemonic strategy training was significantly more beneficial than matched exposure immediately after training, $p = .006$, partial $\eta 2 = .16$, and at 1 month, $p < .001$, partial $\eta 2 = .35$, regardless of diagnostic group (healthy group or aMCI group). Although patients with aMCI demonstrated gains comparable to the healthy control groups, their overall performance generally remained reduced. Mnemonic strategy-related improvement was correlated positively with baseline memory and executive functioning and negatively with inferior lateral ventricle volume in patients with aMCI; no significant relationships were evident in matched-exposure patients. Conclusion: Mnemonic strategies effectively improve memory for specific content for at least 1 month in patients with aMCI. (PsycInfo Database Record (c) 2020 APA, all rights reserved) (Source: journal abstract)" (p. 385).

Author	Credentials: Ph.D., ABPP/CN Position and Institution: Stanley Berent, Ph.D. Collegiate Professor of Psychology University of Michigan Department of Psychiatry; Director, Research Program on Cognition and Neuromodulation Based Interventions; Staff Psychologist, Mental Health Service, VA Ann Arbor Healthcare System; Clinical Core Leader, Michigan Alzheimer's Disease Research Center Publication History in Peer-Reviewed Journals: Moderate, only first author on a few articles
Publication	Type of publication: Scholarly peer-reviewed journals Publisher: American Psychological Association (US)
Date and Citation History	Date of publication: 2021 Cited By: 91
Stated Purpose or Research Question	"Using this OLA paradigm, our primary aims were to examine (a) whether mnemonic strategy training was more beneficial than an exposure-matched control condition, both immediately post training and at a 1-month follow-up time point; (b) whether mnemonic strategies "normalized" performance in aMCI to levels comparable with healthy controls; and (c) the relationship between individual characteristics (standardized neuropsychological measures and medial temporal lobe volumetrics) and training related improvement" (p. 387).
Author's Conclusion	"Although the overall magnitude of improvement was comparable in healthy controls and patients with aMCI, the mnemonic strategies did not clearly " "Normalize' memory test performance in patients with aMCI." (p.397) "It may be appropriate to employ mnemonic strategies in "mild" patients with aMCI (i.e., those closer to "normal") but rehearsal based techniques in more advanced patients with aMCI (i.e., those closer to AD)" (p. 397).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: Discusses older adults and memory loss due to cognitive impairment. Includes strategies for improvement based on level of impairment.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Article comes from a reliable source and author seems to be credible.

	Overview of Article
Type of article	Overall Type: Primary Research Study Specific Type: Randomized control trials
APA Reference	Kamegaya, T., Araki, Y., Kigure, H., & Yamaguchi, H. (2014). Twelve-week physical and leisure activity programme improved cognitive function in community-dwelling elderly subjects: a randomized controlled trial. *Psychogeriatrics, 14*(1), 47–54. https://doi.org/10.1111/psyg.12038
Abstract	"Background: Japan is one of the most rapidly ageing societies in the world. A number of municipalities have started services for the prevention of cognitive decline for community-dwelling elderly individuals, but the effectiveness of these services is currently insufficient. Our study explored the efficacy of a comprehensive intervention programme consisting of physical and leisure activities to prevent cognitive decline in community-dwelling elderly subjects. Method: We administered a 12-week intervention programme consisting of physical and leisure activities aimed at enhancing participants' motivation to participate and support one another by providing a pleasant atmosphere, empathetic communication, praise, and errorless support. This programme for the prevention of cognitive decline was conducted as a service by the city of Maebashi. All participants underwent the Five-Cog test, which evaluated the cognitive domains of attention, memory, visuospatial function, language, and reasoning. Executive function was evaluated by the Wechsler Digit Symbol Substitution Test and Yamaguchi Kanji-Symbol Substitution Test. Subjective health status, level of social support, functional capacity, subjective quality of life, and depressive symptoms were assessed with a questionnaire. Grip strength test, timed up-and-go test, 5-m maximum walking times test, and functional reach test were performed to evaluate physical function. Fifty-two participants were randomly allocated to intervention (n = 26) and control (n = 26) groups. Twenty-six participants, aged between 65–87 years, received intervention once a week at a community centre. The programme was conducted by health-care professionals, with the help of senior citizen volunteers. Results: The intervention group (n = 19) showed significant improvement on the analogy task of the Five-Cog test ($F_{1,38} = 4.242$, $P = 0.046$) and improved quality of life ($F_{1,38} = 4.773$, $P = 0.035$) as compared to the control group (n = 24). Conclusion: A community-based 12-week intervention programme that aimed to enhance motivation to participate in activities resulted in improvements in some aspects of cognitive function and quality of life. Senior citizens who volunteered in the present intervention enabled the smooth implementation of the programme and alleviated the burden on professional staff" (n.p.).

Author	Credentials: PhD Position and Institution: Department of Rehabilitation Sciences, Gunma University Graduate School of Health Science, Maebashi, Japan Publication History in Peer-Reviewed Journals: Limited- may not have found all of publication history due to being an international
Publication	Type of publication: peer-reviewed journal Publisher: England: Blackwell Publishing Ltd
Date and Citation History	Date of publication: 2014 Cited By: 45
Stated Purpose or Research Question	"We have proposed the efficacy of intervention conducted in a pleasant atmosphere with an emphasis on communication" (n.p.). "We performed a randomized controlled trial of a comprehensive intervention programme consisting of physical and leisure activities for prevention of cognitive decline in community-dwelling elderly subjects" (n.p.).
Author's Conclusion	"In conclusion, to prevent cognitive decline, participants took part in a comprehensive 12-week intervention programme consisting of physical and leisure activities" (n.p.). "Participants showed improvement in some aspects of cognitive function and QOL" (n.p).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: Difficult to determine what aspects of the intervention improved cognition but in general applies to EBP questions. International article but the US also has a rapidly increasing older population so should be able to generalize.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The author and source seem reputable. Rated moderate due to unsure of the accuracy of the translation.

Review of Research Studies

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: systematic review and meta-analysis
APA Reference	Rohde, D., Merriman, N. A., Doyle, F., Bennett, K., Williams, D., & Hickey, A. (2017). Does cognitive impairment impact adherence? A systematic review and meta-analysis of the association between cognitive impairment and medication non-adherence in stroke. *PloSone*, *12*(12), e0189339. https://doi.org/10.1371/journal.pone.0189339
Abstract	"Background: While medication adherence is essential for the secondary prevention of stroke, it is often sub-optimal, and can be compromised by cognitive impairment. This study aimed to systematically review and meta-analyse the association between cognitive impairment and medication non-adherence in stroke. Methods: A systematic literature search of longitudinal and cross-sectional studies of adults with any stroke type, which reported on the association between any measure of non-adherence and cognitive impairment, was carried out according to PRISMA guidelines. Odds ratios and 95% confidence intervals were the primary measure of effect. Risk of bias was assessed using the Cochrane Bias Methods Group's Tool to Assess Risk of Bias in Cohort Studies, with evidence quality assessed according to the GRADE approach. We conducted sensitivity analyses according to measure of cognitive impairment, measure of medication adherence, population, risk of bias and adjustment for covariates. The protocol was registered with PROSPERO. Results: From 1,760 titles and abstracts, we identified 9 studies for inclusion. Measures of cognitive impairment varied from dementia diagnosis to standardised cognitive assessments. Medication adherence was assessed through self-report or administrative databases. The majority of studies were of medium risk of bias (n = 6); two studies had low risk of bias. Findings were mixed; when all studies were pooled, there was no evidence of an association between cognitive impairment and medication non-adherence post-stroke [OR (95% CI): 0.85 (0.66, 1.03)]. However, heterogeneity was substantial [$I2$ = 90.9%, p < .001], and the overall evidence quality was low. Conclusions: Few studies have explored associations between cognitive impairment and medication adherence post-stroke, with substantial heterogeneity in study populations, and definitions and assessments of non-adherence and cognitive impairment. Further research using clear, standardised and objective assessments is needed to clarify the association between cognitive impairment and medication non-adherence in stroke" (pp. 1-2).
Author	Credentials: PhD Position and Institution: Position not identified, Division of Population Health Sciences, Royal College of Surgeons in Ireland, Dublin, Ireland Publication History in Peer-Reviewed Journals: moderate

Publication	Type of publication: scholarly peer-reviewed journal Publisher: PLOS ONE Journal Other: United States: Public Library of Science
Date and Citation History	Date of publication: 2017 Cited By: 22
Stated Purpose or Research Question	"The aim of this study, therefore, was to systematically review and meta-analyse the association between cognitive impairment and medication non-adherence in patients with stroke" (p. 3).
Author's Conclusion	"The substantial heterogeneity in study populations and definitions and assessments of adherence and cognitive impairment, coupled with the overall low quality of evidence, make it difficult to draw definitive conclusions. Given the importance of secondary prevention post-stroke and the association between medication adherence and outcomes, further research, with objective measures of adherence, is required to help identify those patients at greatest risk of non-adherence" (p. 15).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This study is directly related to cognitive impairment and medication adherence. It looks to see if there is an association between the two, however it specifically examines these in patients with strokes. It does provide great information on different levels of cognition and medication adherence.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Reputable journal and publisher. Publication within the last 10 years. The author has a moderate publication history.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: systematic review
APA Reference	Smith, D., Lovell, J., Weller, C., Kennedy, B., Winbolt, M., Young, C., & Ibrahim, J. (2017). A systematic review of medication non-adherence in persons with dementia or cognitive impairment. *PloS one, 12*(2), e0170651. https://doi.org/10.1371/journal.pone.0170651
Abstract	"Background: Adherence to medication is vital for disease management while simultaneously reducing healthcare expenditure. Older persons with cognitive impairment (CI) are at risk for non-adherence as cognitive processes are needed to manage medications. This systematic review focuses on the relationship between medication non-adherence and specific cognitive domains in persons with CI, and explores determinants of medication non-adherence. When available, relationships and factors are compared with cognitively intact populations. Methods: A seven database systematic search of studies published between 1 January 1949–31 December 2015 examining medication non-adherence in community dwelling persons with CI or dementia was conducted. Articles reporting medication non-adherence in people with CI or dementia in the community, with or without caregiver supports were eligible for inclusion. Papers reporting adherence to treatments in cognitively intact populations, populations from hospital or institutional settings, for non-prescribed medication or those describing dementia as a factor predicting medication non-adherence were excluded. Data on study and population characteristics, research design, data sources and analysis, specific cognitive domains, non-adherence prevalence, measurement of adherence, salient findings, factors associated with adherence and strategies to improve medication adherence were extracted. Study limitations included inconsistencies between data sources and definitions, resulting in a loss of fidelity in the value and comprehensiveness of data, as well as exclusion of non-pharmacological treatments and regimens. Findings: Fifteen studies met inclusion criteria. Adherence among CI subjects ranged from 10.7%-38% with better rates of adherence in non-CI individuals. Medication non-adherence definitions varied considerably. New-learning, memory and executive functioning were associated with improved adherence and formed the focus of most studies. Multiple factors were identified as modulators of non-adherence. Conclusion: This review highlights a gap in knowledge on how specific cognitive domains contribute to medication non-adherence amongst CI populations, and demonstrates the current focus is limited to two domains: memory and executive functioning" (pp. 1-2).
Author	Credentials: no credentials listed Position and Institution: Research assistant, Department of Forensic Medicine, Monash University, Southbank, Victoria, Australia Publication History in Peer-Reviewed Journals: limited

Publication	Type of publication: scholarly peer-reviewed journal Publisher: PLOS ONE Journal Other: United States: Public Library of Science
Date and Citation History	Date of publication: 2017 Cited By: 133
Stated Purpose or Research Question	"The aim of this systematic review is to elucidate the relationship between medication nonadherence and specific cognitive domains in persons with dementia/CI. The secondary aim is to determine factors related to medication non-adherence in persons with dementia/CI who take medication for treatment of comorbid chronic disease(s)" (p. 3).
Author's Conclusion	"This systematic review consolidates current knowledge about medication non-adherence in persons' with dementia/CI. The literature revealed poor cognitive function as a risk factor of medication non-adherence. It also highlighted the importance of caregivers in assisting with medication adherence or interventions to improve medication adherence" (p. 16).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article looks at the target population of older adults with dementia or cognitive impairments and medication adherence interventions, which is very relevant to the EBP question. The article focuses on community dwelling older adults.
Overall Quality of Article	Overall Quality of Article: good Rationale: Reputable journal and publisher. Publication within the last 10 years. The author has limited publication history, but the article is cited moderately by others.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review following PRISMA guidelines
APA Reference	Aldila, F., & Walpola, R.L. (2021). Medicine self-administration errors in the older adult population: A systematic review. *Research in Social and Administrative Pharmacy, 17*(11), 1877-1886. https://doi.org/10.1016/j.sapharm.2021.03.008
Abstract	"*Background*: Medicine self-administration errors (MSEs) are a longstanding issue in patient safety. Although many studies have examined MSEs in the general adult population, the MSEs that occur specifically in the older adult population and their contributing factors are not well understood. *Objective*: To identify the types of MSEs and their contributing factors among community-dwelling older adults. *Methods*: PubMed, Medline, Embase, CINAHL and Scopus were searched for primary studies published between January 1, 2014 and June 12, 2020. Studies which reported MSEs among community-dwelling older adults (≥50 years of age) and written in English were included in the review. *Results*: Eleven studies met the inclusion criteria. The most commonly reported MSE was a dosing error, followed by missed dose, wrong medicine, incorrect administration methods, wrong administration time and wrong frequency. Seven of the included studies also described factors which contributed to the occurrence of MSEs. The most commonly reported factor contributing to MSEs was complex treatment regimens due to use of multiple medicines. Other factors identified included cognitive decline, decline in physical abilities, lack of social support, lack of knowledge about treatment regimens and negative attitudes and beliefs towards medicines. In most cases, MSEs occurred when multiple contributing factors were present. *Conclusion*: The literature highlights a number of types of MSEs and their contributing factors which occur in the older adult population. Given that many MSEs are preventable, future research is needed into how pharmacists can support the identification and mitigation of factors contributing to MSEs in the older adult population" (p. 1877).
Author	Credentials: Masters of International Public Health and Health Management, Registered Pharmacist Position and Institution: Student at School of Population Health at University Publication History in Peer-Reviewed Journals: Limited
Publication	Type of publication: Academic/Scholarly Publisher: Elsevier Inc. Other: N/A
Date and Citation History	Date of publication: 2021 Cited By: 0
Stated Purpose or	"This systematic review aimed to identify the specific types of MSEs and their contributing factors among the community-dwelling older adult population" (p. 1878).

Research Question	
Author's Conclusion	"This review has identified a number of MSEs and contributing factors to MSEs specific to the older adult population. Given the variety of types of errors and multiple factors contributing to these, pharmacists have the potential to play a pivotal role in identifying potential contributing factors to MSEs and putting in place mitigation strategies to prevent harm in this vulnerable population" (pp. 1884-1885).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article discusses potential medication self-administration errors in the older adult population which is relevant to our EBP question. It also focuses on the community-dwelling population. However, it mainly focuses on the pharmacist's role in this situation rather than a primary care provider.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The article is published in a well-respected journal and examines the studies in following the PRISMA and systematic review procedures. The authors are not well-established in the field and do not have much experience publishing research articles.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review and meta-analysis
APA Reference	Jones, W. E., Benge, J. F., & Scullin, M. K. (2021). Preserving prospective memory in daily life: A systematic review and meta-analysis of mnemonic strategy, cognitive training, external memory aid, and combination interventions. *Neuropsychology*, *35*(1), 123-140. http://dx.doi.org/10.1037/neu0000704
Abstract	"Objective: To preserve or improve independent functioning in older adults and those with neurocognitive impairments, researchers and clinicians need to address prospective memory deficits. To be effective, prospective memory interventions must restore (or circumvent) the underlying attention and memory mechanisms that are impaired by aging, brain injury, and neurodegeneration. We evaluated two decades of prospective memory interventions for efficacy, time/resource costs, and ecological validity. Method: We systematically reviewed 73 prospective memory intervention studies of middle- to older-aged healthy adults and clinical groups (N = 3,749). We also rated the ecological validity of each study's prospective memory assessment/task using a newly developed scale. When possible (72% of studies), we estimated effect sizes using random-effects models and Hedges' g. Results: We identified four categories of prospective memory interventions, including mnemonic strategy, cognitive training, external memory aid, and combination interventions. Mnemonic strategy (g = .450) and cognitive training (g = .538) interventions demonstrated efficacy. Combination interventions showed mixed results (g = .254), underscoring that "more is not always better." External memory aids demonstrated very positive outcomes (g = .805), though often with small-sample, case-series designs. Prospective memory assessments had high ecological validity in external memory aid studies (84%), but not in mnemonic strategy (14%), cognitive training (20%), or combination intervention (50%) studies, $p < .001$, $\eta p2 = .33$. Conclusions: Everyday prospective memory can be meaningfully improved, perhaps particularly with external memory aids, but larger trials are required to optimize treatments, increase adherence, and broaden implementation in daily life" (p. 123).
Author	Credentials: PhD Position and Institution: Department of Psychology and Neuroscience, Baylor University Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Neuropsychology
Date and Citation History	Date of publication: 2021 Google Scholar Cited By: 7

Stated Purpose or Research Question	"First, we sought to identify broad intervention categories and examine their efficacy across objective and subjective measures of prospective memory. Second, we investigated whether the interventions were being tested with measures of high ecological validity, that is, with measures that correspond to the actual prospective memory demands of daily life. Third, we weighed each intervention's efficacy against study design issues (sample size, random assignment, long-term follow-up) and pragmatic issues that impact the likelihood of broad implementation (adherence, time commitment, monetary costs, cognitive demands)" (p. 124-125).
Author's Conclusion	"However, this systematic review and meta-analysis identified that the greatest promise for supporting prospective memory comes from external memory aids. Even as technology is still progressing (to be "age friendly"), external memory aid functionality and device training methods provide the most comprehensive, cost-effective means of prospective memory support" (pp. 135-136).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This systematic review discusses various techniques for preserving prospective memory in daily life, which could be helpful for our research question when addressing cognitive decline. It is also directly related to older adults.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Publication within the last year.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review
APA Reference	Arbesman, M., & Mosley, L. (2012). Systematic review of occupation- and activity-based health management and maintenance interventions for community-dwelling older adults. *American Journal of Occupational Therapy, 66*(3), 277–283. https://doi.org/10.5014/ajot.2012.003327
Abstract	"We describe the results of a systematic review of the literature on occupation- and activity-based health management and maintenance interventions for productive aging. We found moderate to strong evidence that client-centered occupational therapy improved physical functioning and occupational performance related to health management in community-dwelling older adults, as well as in adults with osteoarthritis and macular degeneration. We found moderate evidence that health education programs reduce pain and increase physical activity and that individualized health action plans improve activities of daily living function and participation in physical activities. The evidence that self-management programs result in a decrease in pain and disability and that incorporating cognitive–behavioral principles into physical activity improves long-term participation in exercise was also moderate. Although the evidence for skill-specific training in isolation is limited, effectiveness increases when skill-specific training is combined with health management programs. The implications for practice, education, and research are discussed" (p. 277).
Author	Credentials: PhD, OTR/L Position and Institution: Adjunct Assistant Professor, Department of Rehabilitation Science, University at Buffalo, State University of New York, Williamsville Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Peer-reviewed journal Publisher: American Journal of Occupational Therapy
Date and Citation History	Date of publication: May 1st, 2021 Cited By: 76
Stated Purpose or Research Question	"In this systematic review, we evaluated and synthesized evidence for interventions commonly used in occupational therapy to restore, modify, and maintain performance in the important IADL of health management and maintenance" (p. 278).

Author's Conclusion	"Individualization of self-management programs includes providing health-related information to the client, reflecting on available options, and then developing a program according to the client's preferences. Evidence also supports the use of culturally or linguistically relevant self-management programs to enhance health behaviors, health status, and self-efficacy while decreasing health care utilization" (p. 280).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: The article provides information about the effectiveness of different health management techniques for community-dwelling older adults. It specifically looks at physical functioning and occupational performance related to health management. However, the population focused on older adults with osteoarthritis and macular degeneration, which may not apply to our population of focus.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The article was published in 2012, so it is older compared to some of the other research we have found. The author has quite a bit of other publications, which shows that she is a credible author.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review
APA Reference	Arbesman, M., & Lieberman, D. (2012). Methodology for the systematic reviews on occupation- and activity-based intervention related to productive aging. *The American Journal of Occupational Therapy*, *66*(3), 271–276. https://doi.org/10.5014/ajot.2012.003699
Abstract	"Systematic reviews of the literature relevant to community-dwelling older adults are important to the practice of occupational therapy. We describe the four questions that served as the focus for the systematic reviews of the effectiveness of occupational therapy interventions for older adults living in the community. This article includes the background for the reviews; the process followed for each question, including search terms and search strategy; the databases searched; and the methods used to summarize and critically appraise the literature. The final number of articles included in each systematic review; a summary of the results; the strengths and limitations of the findings; and implications for practice, education, and research are presented" (p. 271).
Author	Credentials: PhD, OTR/L Position and Institution: Adjunct Assistant Professor, Department of Rehabilitation Science, University at Buffalo, State University of New York, Williamsville Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: American Occupational Therapy Association (AOTA)
Date and Citation History	Date of publication: 2012 Google Scholar Cited By: 26
Stated Purpose or Research Question	"The four focused questions included in the review were as follows: 1. What is the evidence that participation in occupation and activities supports the health of community dwelling older adults? 2. What is the evidence for the effect of occupation and activity-based interventions on the performance of selected instrumental activities of daily living (IADLs) for community-dwelling older adults? 3. What is the evidence for the effect of occupation- and activity-based health management and maintenance interventions on the performance of community dwelling older adults? 4. What is the evidence for the effect of home modification and fall prevention interventions and programs on the performance of community-dwelling older adults?" (p. 272)
Author's Conclusion	"By reviewing the scientific literature broadly and appraising and synthesizing specific studies, the authors of the reviews have been able to provide up-to-date answers to critical questions that may previously have been informed only by clinical expertise" (p. 274).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: The study does focus on older adults and has pieces that looked at health management. However, the study only briefly and broadly talked about effective techniques to improve health behaviors and health status.
Overall Quality	Overall Quality of Article: Good

of Article	Rationale: Established authors, reputable journal and publisher, publication within the last 10 years.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review
APA Reference	Berger, S., Escher, A., Mengle, E., & Sullivan, N. (2018). Effectiveness of health promotion, management, and maintenance interventions within the scope of occupational therapy for community-dwelling older adults: A systematic review. *American Journal of Occupational Therapy, 72*(4), 1-10. http://dx.doi.org/10.5014/ajot.2018.030346
Abstract	"Objective: This systematic review examined the effectiveness of health promotion, management, and maintenance interventions within the scope of occupational therapy to improve occupational performance and quality of life (QOL) and decrease health care utilization for community-dwelling older adults. Method: Thirty-eight articles representing 36 studies were included in the review. Articles were published 2008–2015 and described studies of participants with a mean age of 65 or older who were living in the community. Results: Strong evidence supports the use of group, individual, or a combination of group and individual interventions to improve occupational performance. Group interventions were also effective at improving QOL. The evidence was insufficient that any of these interventions decreased health care utilization. Conclusion: Addressing health promotion, management, and maintenance is within the scope of occupational therapy practice and has been shown to improve occupational performance and QOL for older adults. Implications for practice and future research are discussed" (p. 1).
Author	Credentials: PhD Position and Institution: Clinical Associate Professor, Department of Occupational Therapy, Boston University, Boston, MA Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: American Occupational Therapy Association (AOTA)
Date and Citation History	Date of publication: 2018 Cited By: 23
Stated Purpose or Research Question	"The current systematic review is an update and expansion of the previous review and addresses the question, What is the evidence for the effect of health promotion, management, and maintenance interventions within the scope of occupational therapy on the occupational performance, QOL, and health care utilization of community-dwelling older adults?" (p. 2)
Author's Conclusion	"Practitioners should consider providing group or individual health promotion, management, and maintenance interventions to improve occupational performance; providing group health promotion, management, and maintenance interventions to improve QOL; and including individualized goal setting, coping strategies, problem-solving techniques, and skill-specific practice in health promotion, management, and maintenance interventions with older adults" (p. 7).

Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: Information is relevant to our research topic on older adults and health management. However, this article does not specifically look at a population with cognitive decline, which is very important to our research question.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established authors, reputable journal and publisher, publication within the last 3 years, however articles used were from 2008-2015 so some info may be a bit outdated.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review
APA Reference	Chapman, B., & Bogle, V. (2014). Adherence to medication and self-management in stroke patients. *British Journal of Nursing, 23*(3), 158-66. doi: 10.12968/bjon.2014.23.3.158.
Abstract	"Background: Stroke is the third most common cause of mortality and one of the leading causes of adult physical disability in England. Medical treatment is imperative for the management of stroke and the risk reduction of recurrent stroke. The success of a medical treatment is determined largely by adherence. However, research has shown that adherence to medication in patients who have had a stroke is often suboptimal. Self-management interventions have been shown to improve adherence in long-term conditions. The impact of self-management interventions specifically on adherence to stroke medication is unknown. Objective: To review systematically the impact that self-management interventions have on adherence to stroke medication. Method: The online databases that were systematically searched included PsychINFO, MEDLINE, EMBASE, Scopus, Cochrane Database of Systematic Reviews, CINAHL and Web of Science. Reference lists of retrieved studies were hand-searched. Results: Six studies met the criteria for inclusion in the systematic review. Self-management interventions for stroke patients were effective in improving adherence to stroke medication in the short term. However, in the longer term, these benefits were not maintained. Conclusions: Applying self-management interventions to improve medication adherence in stroke patients across integrated clinical settings shows promise. However, further development of such interventions and research is recommended, with more stringent methodologies and longer follow-up periods" (p. 32).
Author	Credentials: PhD Position and Institution: Research and Project Manager at Visions4health Ltd. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: British Journal of Nursing
Date and Citation History	Date of publication: 2/13/2014 Cited By: 41
Stated Purpose or Research Question	"To review systematically the impact that self-management interventions have on adherence to stroke medication" (p. 32).

Author's Conclusion	"Overall, half of the findings support self-management strategies becoming an integral part of stroke management. However, because half do not, firm conclusions cannot be drawn" (p. 35).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: This article does look at medication management in older adults, however it looks at in a stroke population which is not a part of our EBP question. The article suggests that interventions can be useful to address medication management.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Decently established authors, reputable journal and publisher, publication within the last 10 years, however, it only included 6 studies.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic review
APA Reference	Sakaki, K., Nouchi, R., Matsuzaki, Y., Saito, T., Dinet, J., & Kawashima, R. (2021). Benefits of VR Physical Exercise on Cognition in Older Adults with and without Mild Cognitive Decline: A Systematic Review of Randomized Controlled Trials. *Healthcare (Basel)*, *9*(7), 883. https://doi.org/10.3390/healthcare9070883
Abstract	"It is well known that physical exercise has beneficial effects on cognitive function in older adults. Recently, several physical exercise programs with virtual reality (VR) have been proposed to support physical exercise benefits. However, it is still unclear whether VR physical exercise (VR-PE) has positive effects on cognitive function in older adults. The purpose of this study was to conduct a systematic review (SR) of the effects of VR-PE on cognitive function in older adults with and without cognitive decline. We used academic databases to search for research papers. The criteria were intervention study using any VR-PE, participants were older adults with and without mild cognitive decline (not dementia), and cognitive functions were assessed. We found that 6 of 11 eligible studies reported the significant benefits of the VR-PE on a wide range of cognitive functions in aging populations. The SR revealed that VR-PE has beneficial effects on the inhibition of executive functions in older adults with and without mild cognitive decline. Moreover, VR-PE selectively leads to improvements in shifting and general cognitive performance in healthy older adults. The SR suggests that VR-PE could be a successful approach to improve cognitive function in older adults with and without cognitive decline" (p. 1).
Author	Credentials: PhD Position and Institution: Department of Functional Brain Imaging, Institute of Development, Aging and Cancer, Tohoku University Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Multidisciplinary Digital Publishing Institute
Date and Citation History	Date of publication: 2021 Cited By: 0
Stated Purpose or Research Question	"We aimed to conduct a systematic review of the beneficial effects of VR-PE on cognition" (p. 2).
Author's Conclusion	"The SR indicates that VR-PE would have a possibility to improve cognitive function in older adults. However, due to a small number of included studies, further studies will be necessary to draw a conclusion of the benefits of VR-PE on cognition" (p. 12).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: The article seemed to align with our EBP question (older adults, cognition, etc) however it did not really cover much medication management. The article suggested ways that cognitive function could be improved in the older adult population.

Overall Quality of Article	Overall Quality of Article: Moderate Rationale: The information and study itself seemed to be of pretty good quality and it was a very recently done study, however the author's credentials were a bit questionable and there were no other studies that cited this study (this could be because it was so new).

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: systematic review
APA Reference	Hoy, S., Östh, J., Pascoe, M., Kandola, A., & Hallgren, M. (2021). Effects of yoga-based interventions on cognitive function in healthy older adults: A systematic review of randomized controlled trials. *Complementary Therapies in Medicine*, *58*, 102690. https://doi.org/10.1016/j.ctim.2021.102690
Abstract	"Background: The world's elderly population is growing. Physical activity has positive effects on health and cognition, but is decreasing among the elderly. Interest in yoga-based exercises has increased in this population, especially as an intervention targeting balance, flexibility, strength, and well-being. Recent interest has arisen regarding yoga's potential benefits for cognition. Objective: To systematically review evidence from randomized controlled trials (RCTs) examining the effects of yoga-based interventions on cognitive functioning in healthy adults aged ≥60. A secondary aim was to describe intervention characteristics and, where possible, the extent to which these influenced study outcomes. Method: The review was conducted in accordance with PRISMA guidelines. Searches were performed from inception to June 2020 using the following electronic databases: (1) PubMed (NLM); (2) Embase (Elsevier); (3) Cochrane Central (Wiley); (4) PsycINFO (EBSCOhost); and (5) Cinahl (EbscoHost). Inclusion criteria: RCTs of yoga-based interventions assessing cognition in healthy adults ≥60 years. Risk of bias was assessed using the revised Cochrane risk of bias tool. Results: A total of 1466 records were initially identified; six studies (5 unique trials) were included in the review. Four of the six articles reported significant positive effects of yoga-based interventions on cognition, including gross memory functioning and executive functions. Intervention characteristics and assessment methods varied between studies, with a high overall risk of bias in all studies. Conclusion: Yoga-based interventions are associated with improvements in cognition in healthy older adults. Adequately powered RCTs with robust study designs and long-term follow-ups are required. Future studies should explicitly report the intervention characteristics associated with changes in cognitive function" (p. 1).
Author	Credentials: BSc Public Health, MSc Sport Science Position and Institution: Doctoral student in sports science, Department of Movement, Culture and Society, The Swedish School of Sport and Health Sciences (GIH), Stockholm, Sweden Publication History in Peer-Reviewed Journals: very limited
Publication	Type of publication: international, peer-reviewed journal Publisher: Complementary Therapies in Medicine Other: N/A

Date and Citation History	Date of publication: February 19, 2021 Cited By: 2
Stated Purpose or Research Question	"The main aim of this systematic review was to examine the effect of yoga-based interventions on cognitive functioning in adults aged ≥60. A secondary aim was to describe intervention characteristics and, where possible, the extent to which these influenced study outcomes" (p.2).
Author's Conclusion	"Yoga-based interventions show potential to improve cognition in healthy older adults. However, there are currently few published studies on the topic, all with a high risk of bias" (p. 6).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: Answers the question of ways to improve cognition specifically in older adults. Yoga based interventions improve cognition and improved cognition relates to improved memory and medication adherence.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Generally reliable source but the author is a student. The study also cites the research used has a high risk of bias.

	Overview of Article
Type of article	Overall Type: Review of Research Study Specific Type: Systematic Review
APA Reference	Foster, E. R., Carson, L. G., Archer, J., & Hunter, E. G. (2021). Occupational Therapy Interventions for Instrumental Activities of Daily Living for Adults With Parkinson's Disease: A Systematic Review. *American Journal of Occupational Therapy*, *75*(3). https://doi.org/10.5014/ajot.2021.046581
Abstract	"Importance: Instrumental activities of daily living (IADLs) are important for independence, safety, and productivity, and people with Parkinson's disease (PD) can experience IADL limitations. Occupational therapy practitioners should address IADLs with their clients with PD. Objective: To systematically review the evidence for the effectiveness of occupational therapy interventions to improve or maintain IADL function in adults with PD. Data Sources: MEDLINE, CINAHL, PsycINFO, OTseeker, and Cochrane databases from January 2011 to December 2018. Study Selection and Data Collection: Primary inclusion criteria were peer-reviewed journal articles describing Level 1–3 studies that tested the effect of an intervention within the scope of occupational therapy on an IADL outcome in people with PD. Three reviewers assessed records for inclusion, quality, and validity following Cochrane Collaboration and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Findings: Twenty-two studies met the inclusion criteria and were categorized into four themes on the basis of primary focus or type of intervention: physical activity, specific IADL-focused, cognitive rehabilitation, and individualized occupational therapy interventions. There were 9 Level 1b, 9 Level 2b, and 4 Level 3b studies. Strong strength of evidence was found for the beneficial effect of occupational therapy–related interventions for physical activity levels and handwriting, moderate strength of evidence for IADL participation and medication adherence, and low strength of evidence for cognitive rehabilitation. Conclusions and Relevance: Occupational therapy interventions can improve health management and maintenance (i.e., physical activity levels, medication management), handwriting, and IADL participation for people with PD. Further research is needed on cognitive rehabilitation. This review is limited by the small number of studies that specifically addressed IADL function in treatment and as an outcome. What This Article Adds: Occupational therapy intervention can be effective in improving or maintaining IADL performance and participation in people with PD. Occupational therapy practitioners can address IADL function through physical activity interventions, interventions targeting handwriting and medication adherence, and individualized occupational therapy interventions" (p. 1).

Author	Credentials: PhD, OTD, OTR/L Position and Institution: Assistant Professor of Occupational Therapy, Neurology and Psychiatry, Washington University School of Medicine in St. Louis, St. Louis, MO Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journals. Publisher: The American Journal of Occupational Therapy Other: Sponsored by the American Occupational Therapy Association
Date and Citation History	Date of publication: 12 April 12, 2021 Cited By: 3
Stated Purpose or Research Question	"The purpose of this review is to assist practitioners in making evidence-based decisions regarding such interventions" (p. 2). "We used the following focused question: What is the evidence for the effectiveness of interventions within the scope of occupational therapy to improve or maintain performance and participation in IADLs for adults with PD?" (p. 2)
Author's Conclusion	"Occupational therapy interventions can improve health management and maintenance (i.e., physical activity levels, medication management), handwriting, and IADL participation for people with PD. Further research is needed on cognitive rehabilitation" (p. 8).
Overall Relevance to your EBP Question	Overall Relevance of Article: Moderate Rationale: The article does discuss focus on cognitive rehabilitation in relation to improving IADLs including medication management and adherence. However, the article focuses specifically on Parkinson's disease which in general can be helpful but is not the target population of the EBP question.
Overall Quality of Article	Overall Quality of Article: Good Rationale: From a reputable source and very recently published. Discussed limitations and implications for future research.

Conceptual or Theoretical Articles

	Overview of Article
Type of article	Overall Type: Conceptual Article Specific Type: N/A
APA Reference	American Occupational Therapy Association. (2017). Occupational therapy's role in medication management. *American Journal of Occupational Therapy*, *71*(Supplement_2), 1–20. https://doi.org/10.5014/ajot.2017.716s02
Abstract	The American Occupational Therapy Association (AOTA) asserts that occupational therapy practitioners are well prepared to contribute to improving medication adherence by addressing medication management. The purposes of this position paper are to define medication management, describe the significance of medication management in health and wellness, and articulate occupational therapy's distinct contributions to interprofessional efforts to address medication management.
Author	Credentials: Carol Siebert, OTD, OTR/L, FAOTA Position and Institution: Owner/Principal, The Home Remedy, Chapel Hill, NC. Publication History in Peer-Reviewed Journals: Moderate
Publication	Type of publication: Peer Reviewed Journal Publisher: The American Journal of Occupational Therapy
Date and Citation History	Date of publication: August 23, 2017 Cited By: 13
Stated Purpose or Research Question	"The purposes of this position paper are to define medication management, describe the significance of medication management in health and wellness, and articulate occupational therapy's distinct contributions to interprofessional efforts to address medication management" (p. 1).
Author's Conclusion	"Medication adherence depends on effective medication management, which is an essential daily activity for those for whom medication is prescribed to preserve health and function. Occupational therapists analyze and formulate tailored solutions to problems associated with the performance of medication management activities" (p. 6).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: Focuses on OTs role in aiding older adults with medication adherence. This article suggests interventions that occupational therapists could use to address medication management.
Overall Quality	Overall Quality of Article: Good

of Article	Rationale: While the article did not conduct their own primary research study they used a large number of references to produce the article. Reliable journal.

Measurements and Tools

	Overview of Article
Type of article	Overall Type: Measurements and Tools Specific Type: Face and content validity assessment
APA Reference	Patel, T., McDougall, A., Ivo, J., Carducci, J., Pritchard, S., Chang, F., Faisal, S., & Lee, C. (2021). Development and content validation of an instrument to measure medication self-management in older adults. *Pharmacy, 9*(2), 78. https://doi.org/10.3390/pharmacy9020078
Abstract	"Background: For older adults, the capacity to self-manage medications may be limited by several factors. However, currently available tools do not permit a comprehensive assessment of such limitations. The Domain Specific Limitation in Medication Management Capacity (DSL-MMC) was developed to address this need. This study aimed to establish the face and content validity of the DSL-MMC. Methods: The DSL-MMC tool consisted of 4 domains and 12 sub-domains with 42 items including: 1. physical abilities (vision, dexterity, hearing); 2. cognition (comprehension, memory, executive functioning); 3. medication regimen complexity (dosing regimen, non-oral administration, polypharmacy); and 4. access/caregiver (prescription refill, new prescription, caregiver). Pharmacists assessed each item for relevance, importance, readability, understandability, and representation. Items with content validity index (CVI) scores of <0.80 for relevance were examined for revision or removal. Results: Twelve pharmacists participated in the study. CVI scores for relevance and importance of domains were 1.0; of the sub-domains, two were below 0.80. Among the 42 items, 35 (83%) and 30 (71%) maintained CVI scores above 0.80 for relevance and importance, respectively. Five items were removed, three were merged and seven were modified due to low CVI scores and/or feedback. Conclusion: The DSL-MMC has been validated for content" (p. 1).
Author	Credentials: BScPharm, PharmD, Postdoctoral Research Fellowship in Neurology/Pharmacokinetics Position and Institution: Clinical Associate Professor in the School of Pharmacy at the University of Waterloo Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: international, scientific, peer-reviewed, open access Publisher: MDPI Other: N/A
Date and Citation History	Date of publication: April 11, 2021 Cited By: 0
Stated Purpose or Research Question	"The objective of this study was to examine the face and content validity of the DSL-MMC" (p. 3).
Author's Conclusion	"The items captured in the instrument, Domain Specific Limitations in Medication Management Capacity, permits a comprehensive assessment of the different factors

	that impact self-management of medications in older adults as demonstrated by an S-CVI of 0.90 The DSL-MMC has been validated for content" (p. 1, 8).
Overall Relevance to your EBP Question	Overall Relevance of Article: Good Rationale: This article is relevant because it validated a study that primary care providers would be able to use to assess the capacity to self-manage medication. It also identifies barriers that older adults face to medication management.
Overall Quality of Article	Overall Quality of Article: Good Rationale: The author is well-established and has good credentials. The study is recent. They did note that the study was unbalanced because the majority of the pharmacist participants were female.

Appendix B. Critical Appraisals

Primary Research Study

Critical Appraisal: Medication adherence in older adults: A qualitative study.

	Summary
APA Reference	Holt, E.W., Rung, A.L., Leon, K.A., Firestein, C., & Krousel-Wood, M. (2014). Medication adherence in older adults: A qualitative study. *Educational Gerontology, 40,* 198-211. https://doi.org/10.1080/03601277.2013.802186
Abstract	"To effectively address medication adherence and improve cardiovascular health among older adults, a deeper understanding is needed of the barriers that this age group faces and of approaches that would be most effective and feasible for improving adherence. We conducted a focus group study (n = 25) in a diverse population of older adults with hypertension recruited from the Cohort Study of Medication Adherence in Older Adults (CoSMO). A structured guide was used to collect feedback on barriers to adherence and acceptability and the feasibility of intervention strategies. The final coding framework outlines factors at the individual, relationship, health care system, and environmental or policy level that affect adherence in older adults. These include memory, knowledge, attitudes and beliefs, side effects, social support, interaction with healthcare providers, and cost and convenience of medication filling. Patient responses highlighted the varied nature of barriers and the need for interventions that are both multifaceted and tailored" (p. 1).
Your Focused Question and Clinical Bottom Line	*Question:* How to improve medication adherence in older adults? *Clinical Bottom Line:* Social support, patients' knowledge, attitudes and beliefs, patient-provider interventions, and medication costs are all identified as factors contributing to a patient's medication adherence. Hospitals, clinics, and health care providers can have immense impacts on these factors (p. 12).

Your Lay Summary	This study looked at some of the hard things older people experience with their medication directions. This study took four groups of people and had group conversations to figure out why it was hard to follow the medication directions. The groups included one group of white people who always took their medications correctly, one group of white people who sometimes took their medications correctly, one group of black people who always took their medications correctly, and one group of black people who sometimes took their medications correctly. Through the group conversations, this study found that the hard part of following the medication directions was remembering to take the medications, what the person knows and believes about the medications, how the medications made the person feel, the person's family and friends, the person's experiences with hospitals, and the cost and easiness of getting the medications. The study talked about how these issues could be improved through things such as support groups, good relationships with doctors, and lower medication costs.
Your Professional Summary	Through the use of a qualitative longitudinal cohort study, this study aims to "investigate barriers to medication adherence and gain feedback on acceptable intervention strategies" (p. 2). The researchers of this study took 25 participants and divided them into 4 subgroups (6-12 per subgroup) based on race and adherence level. The four groups included a group of white high adherers, a group of white low adherers, a group of black high adherers, and a group of black low adherers. Each subgroup participated in a focus group interview with researchers to discover the specific barriers and interventions in medication adherence. Through this study, researchers discovered that social support, patients' knowledge, attitudes and beliefs, patient-provider interventions, and medication costs are all identified as factors contributing to a patient's medication adherence. Strengths of this research include the open-ended questions that allow for a richness and depth of data, the generalizable of the study because of the insured older adults population, and the diversity of race and adherence level in the sample. Weaknesses of the study include a high rate of no-shows limited the sample size in low adherence groups and the study was not designed to investigate the impact of depression and mental quality of life. This study shows how healthcare providers can play an important role in identifying patients at risk for low medical adherence and implementing strategies to address barriers to medication adherence.
	Critical Appraisal
Stated Purpose or Research Question	"We conducted a focus group study in a diverse population of insured older adults to investigate barriers to medication adherence and gain feedback on acceptable intervention strategies" (p. 2).

Background Literature	*Key points of the intro section:* "Hypertension is an important risk factor for cardiovascular morbidity and mortality" (p. 1). "Despite the fact that effective therapies for hypertension are available, suboptimal adherence remains a public health and clinical challenge in this age group" (p. 1). "Further qualitative research is needed to understand which strategies are most acceptable for improving adherence among populations of older adults who have health insurance and access to medical care" (p. 2). *Theoretical perspective:* Not given- this study was conducted after a parent study was completed.
Research Design	*Research design:* Qualitative longitudinal cohort study *Rationale for the design:* *"*Qualitative research is needed to understand which strategies are most acceptable for improving adherence among populations of older adults who have health insurance and access to medical care. To fill this gap, we conducted a focus group study in a diverse population of insured older adults to investigate barriers to medication adherence and gain feedback on acceptable intervention strategies" (p. 2). *For quantitative primary research, AOTA Level of Evidence:* Is qualitative but could be considered a level IV
Sampling	*Sampling method used and the rationale (if given).* Indicated interest in this study during a previous study (Cohort Study of Medication Adherence in Older Adults). Recruitment lists (one for each of the subgroups) were randomly ordered and eligible participants were contacted by phone and offered to participate *Inclusion criteria:* 65 years and older Receiving treatment for essential hypertension Part of a large managed care organization (MCO) in southeastern Louisiana *Other criteria from the previous "parent study" was described in a different article* *Exclusion criteria:* Evidence of severe cognitive impairment *Power/sample size estimate:* Not reported

Sample	*Number of Participants (Total and Subgroups):* 25 participants and 4 subgroups (6-12 per group originally based on race and adherence level) *Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability):* 68% white 54% between the ages of 70-75 40% were classified as low adherers 64% were women 56% were married 43% were taking 3 or more classes of antihypertensive medications *Dropouts:* Originally there was a total of 39 participants, but 14 canceled or did not show up to the focus groups because of conflicts or weather
Groups	*Types of groups: (e.g., intervention, sample characteristic):* White/low adheres, White/high adherers, Black/low adherers, Black/high adherers *Group one description:* the white and low adherers group was the group of participants that identified as White and had a MMAS-8 score of less than 6 over the last two years *Group two description:* the white and high adherers group was the group of participants that identified as White and had an MMAS-8 score of 8 over the last two years *Group three description:* the Black and low adherers group was the group of participants that identified as Black and had a MMAS-8 score of less than 6 over the last two years *Group four description:* the black and high adherers group was the group of participants that identified as Black and had an MMAS-8 score of 8 over the last two years
Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review)* 4 separate 2-hour focus groups were done (one per subgroup). Each session was led by a trained moderator and an assistant. At the beginning of the session, the moderator conducted group introductions and paperwork. Then, the moderator and assistant conducted a guided interview using a research guide the researchers had developed containing open-ended questions and probes to better understand the barriers and facilitators to medication adherence (p. 3). After the focus groups, the researchers analyzed the data through coding the interviews. First, coders individually read focus group transcripts. Then they reread transcripts and identified any recurring themes or concepts. Within the group's subgroups, the coders identified themes and sorted quotes until no new categories or subcategories could be created. After the coders had finished coding independently, they came back together and compared categories and subcategories (p. 3).

Measurement and Outcomes	Structured interview guide using open-ended questions and probes (*exact questions not included*) Questions on: Barriers and facilitators of antihypertensive medication adherence Acceptability and feasibility of interventions During the coding process, researchers first individually read the interviews and created “a provisional coding frame based on the focus group discussion guide of a priori identified themes (three of the coders used the long-table approach to create a coding frame by hand and one coder used QSR NVivo 8 © Software for coding frame creation)”. Then they repeated the process. After reading and coding individually twice, researchers came back together and created themes together (p. 3). “SAS version 9.1 was used to compute summary statistics of focus group participants” (p. 3).

Results	*Description of the sample:* 39 participants were scheduled to take part in the study Only 25 actually ended up participating 68% White 54% were between the ages of 70 and 75 40% were classified as low adherers according to the MMAS-8 scores 64% of participants were women 56% were married 43% were taking 3 or more classes of antihypertensive medications *Analysis/theme one:* "Patient (Individual-level)—Memory and forgetfulness were repeatedly emphasized as important barriers to adherence. Many patients had difficulty remembering to take their medications" (p. 4). *Analysis/theme two:* "Family, Friends, and Community—interpersonal relationships, specifically, support from family and friends, and peer or community groups, were identified as important contributors to adherence, and participants thought that this was particularly important for patients who live alone" (p. 7). *Analysis/theme three:* "Health care system—Participants spent a substantial amount of time discussing their interactions with their health care providers, and how this may or may not affect their adherence. Overall, there was general agreement that open communication with their doctor was an important facilitator of adherence" (p. 7). *Analysis/theme four:* "Environmental and policy level—The cost and coverage of medications were identified as important policy-level barriers to adherence; these themes were stressed by participants across race and adherence groups. Several participants admitted that because of the high cost of medications they often had to skip, reduce doses, or use pill-cutting strategies" (p. 8).

Authors' Discussion and Conclusion	*Idea one:* "An area of particular emphasis in our focus group discussions was the role that components of the health care system can play in addressing medication adherence. Because knowledge, attitudes, and beliefs were consistent themes among participants, hospitals, clinics, and health care providers are ideally suited to deliver interventions tailored to the adherence barriers of the individual patient" (pp. 9-10). *Idea two:* "Both in the current study and in previous qualitative studies, participants emphasized memory, forgetfulness, or unintentional skipping of doses as important reasons for non-adherence. Once identified, patients facing these barriers would benefit most from interventions that emphasize the initiation of medication regimens and reminder protocols" (p. 10). *Idea three:* "Participants in our study emphasized that non-adherence often stems from patients' lack of knowledge about hypertension, attitudes towards health maintenance behaviors, or beliefs about hypertension and antihypertensive medications. Participants stressed that multi-disciplinary educational programs which emphasize the causes, consequences, and management of hypertension can play an integral role in increasing patients' knowledge, changing their attitudes, and consequently increasing their motivation to adhere to established guidelines for blood pressure control. By referring patients to educational programs on chronic disease management, providers could make a significant impact on patient adherence" (p. 11). *Idea four:* "Despite the fact that the seniors in this study had health insurance and access to medical care, participants discussed medication cost as an important contributor to non-adherence. Recent findings that increased medication adherence among Medicare Beneficiaries results in overall cost reductions to the health care delivery system may provide impetus for future programs designed to help offset patient co-pay costs (Congressional Budget Office 2012). Health care providers can improve cost-related low adherence by inquiring about cost barriers and switching patients to generic brand medications" (p. 11).
Authors' Limitations	High rate of no-shows = limited sample size in low adherence groups Did not look at depression and mental QoL (important correlation to medical adherence) All ethnicities and races are not included (limitations in generalizing to other populations outside of White and Black)

Authors' Implications For Practice and Future Research	Health care providers can play an important role in identifying patients at risk for low adherence and implementing strategies to address barriers (p. 12). Future research: More than one group per strata Include more participants with depressive symptoms Emphasize anonymity Questions focused on sensitive issues Test interventions that are tailored to the needs of individual patients and delivered through the health care system (p. 12).

Critical Appraisal: Elder and caregiver solutions to improve medication adherence.

	Summary
APA Reference	O'Quin, K. E., Semalulu, T., & Orom, H. (2015). Elder and caregiver solutions to improve medication adherence. *Health Education Research, 30*(2), 323–335. https://doi.org/10.1093/her/cyv009
Abstract	"Medication mismanagement is a growing public health concern, especially among elders. Annually, it is a major contributor to emergency hospitalization and nursing home placement. Elders and their caregivers, as healthcare consumers and stakeholders in this issue, are uniquely qualified to inform strategies to improve medication adherence. We conducted a qualitative study to ascertain caregiver and elder perceptions of barriers to medication management and to identify community-derived solutions to improve medication management. Nine focus groups (N = 65, mean age = 71) were conducted with caregivers or elders from five communities. Participants were recruited by key informants utilizing snowball sampling methodology. The following themes were identified in the participant-recommended proposed solutions improving medication adherence: (i) use of personal systems to overcome barriers to medication adherence, (ii) various solutions to address cost concerns, (iii) the need for regular review of medications by doctors or pharmacists to eliminate unnecessary medications, (iv) desire for community-driven support systems, and (v) using medical advocates. Elders and caregivers recognized medication non-adherence as a community-wide issue and were eager to offer solutions they thought would work in their communities. These solutions can lend credibility to strategies currently being developed/utilized and offer innovative recommendations for future interventions" (p. 323).
Your Focused Question and Clinical Bottom Line	*Question:* What strategies for improving medication management would older adults find most helpful? *Clinical Bottom Line:* Older adults and caregivers have identified specific recommendations for improving medication adherence such as routines, access to healthcare support, reducing costs, and implementing community-based support systems.
Your Lay Summary	The researchers wanted to find out how older adults think taking medicine could be made safer and more successful. The researchers talked to small groups of older adults and small groups of caretakers. They asked them questions about why they might not take their medicine the right way and what might help them remember to take their medicine. After talking to the small groups, the researchers saw some ideas that were the same across all groups. They said it would help to have a schedule or reminder to take their medicine. Another idea was that medicine should be cheaper. It would be easier to take medicine if they had less medicine to take every day. They also thought it would be helpful to have someone be able to answer questions about their medicine. This research shows that older adults need better ways to help them take their medication on time and the right amount. It is also important to listen to what

	strategies older adults want to try. Following the plans older adults want to do might help them take their medicine safely and successfully.
Your Professional Summary	The purpose of this study was to examine strategies that older adults and caregivers think would help improve safe and successful medication management. The researchers conducted six focus groups with older adults and three with caregivers, with a total of 65 participants. Through semi-structured interviews, several themes were identified. The first was that forgetting to take medication was a common barrier, which could be solved by implementing a system or routine that provides reminders to take medication. Another theme was that the cost of medication is too high and could be reduced by offering options for different lengths of prescriptions. A third barrier was that there were too many medications to take; this could be solved by reducing the number of medications prescribed. The participants also said that it was difficult to understand and remember the purpose and names of all their medications. It would be helpful to have a medical advocate who could answer questions about their medications, side effects, and possible drug interactions. A final idea was to implement community support programs, such a group or neighbor that could check in on older adults. A strength of this study is that it is a qualitative design, which gives insight into personal experiences. A limitation of this study is that they only included English-speaking participants and family caregivers rather than professionals, which limits the perspectives they get. This research shows the importance of understanding what strategies older adults might find most useful. By using these strategies, rather than a plan they might not want to follow or agree with, the ability of older adults to adhere to medication guidelines successfully may increase.
	Critical Appraisal
Stated Purpose or Research Question	"… we conducted focus groups with elders and caregivers from Western New York, with the goal of describing not only how elders and their caregivers perceive barriers to medication management, but to identify community-derived solutions to improve medication management" (p. 324).
Background Literature	*Key points of the intro section:* "More than half of elders use five or more medications a day and nearly 30% use five or more prescription medications a day. The increasing number of elders using multiple medications contributes to a rising public health concern: medication non-adherence" (p. 323). "It has been estimated that, each year, 28% of hospitalizations in the elderly are drug related. Additionally, approximately 3 million older adults are admitted into nursing homes and skilled nursing facilities because of medication mismanagement-related events and other drug-related problems annually" (p. 323). "Several barriers to medication adherence have been reported for elders. These include cognitive deficits, diminished physical senses, the increased risk of side effects associated with aging, taking large numbers of medication and complexity of medication regimens, beliefs that may conflict with adherence protocols, practicing alternative medicine that may conflict with adherence protocols, and perceived need and effectiveness of medications" (p. 323).

	"Taking into account healthcare consumers' preferences may improve the effectiveness and accessibility of services, as well as meet an ethical obligation that patients be involved in decision making about the care they receive" (p. 324). *Theoretical perspective:* Not reported.
Research Design	*Research design:* Qualitative research (focus groups) *Rationale for the design:* "We posit that elders and their caregivers, as healthcare consumers and stakeholders in the issue, are uniquely qualified to inform our strategies to improve medication adherence. To this end, we conducted focus groups with elders and caregivers…" (p. 324). *For quantitative primary research, AOTA Level of Evidence:* Level IV. This study is a qualitative cohort study.
Sampling	*Sampling method used and the rationale (if given):* Snowball sampling *Inclusion criteria:* "Inclusion criteria for the elder focus groups were being age 60 or older, and having taken medication at least once a day for 10 consecutive days during the previous 6 months. The inclusion criterion for the caregiver focus groups was being a caregiver of an elder who met the above criteria" (p. 324). *Exclusion criteria:* Not reported. *Power/sample size estimate:* Not reported.
Sample	*Number of Participants (Total and Subgroups):* A total of 65 participants were recruited. "There were 17 participants in the caregiver focus groups and 48 participants in the elder focus groups" (p. 325). *Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability):* Elders: Mean age: 72 Race: 76% white, 22% Black, 2% Other Sex: 73% female, 27% male Education: 4% Some H.S., 29% H.S. Grad/GED, 38% Some College, 29 % College Grad Employment: 11% Employed, 82% Retired, 7% Unable/Disability Caregivers Mean age: 66 Race: 100% White Sex: 88% Female, 12% Male Education: 6% Some H.S., 25% H.S. Grad/GED, 19% Some College, 50% College Grad Employment: 31% Employed, 63% Retired, 6% Unable/Disability *Dropouts:* Not reported.
Groups	*Types of groups: (e.g., intervention, sample characteristic):* Focus groups based on role as Elder or Caregiver.

	Group one description: The Elder focus groups were living in urban or rural counties. They were from either villages, small cities, or medium cities. *Group two description:* The Caregivers focus groups were living in urban or rural counties. They were from either villages or small cities.
Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review)* "Nine focus groups were conducted" (p. 324). "The semi-structured interview guide was developed… The topics covered in the interview guide included: barriers to, and facilitators of effective medication management, knowledge of medications, strategies to improve medication management and question asking during interactions with healthcare provider. Some example questions include: There are many reasons why some people do not take their medications as prescribed – In your experience, what are the three biggest reasons why you or someone you know doesn't take medications as prescribed? Is taking the medications you are prescribed compatible with your quality of life?" (pp. 324-325).
Measurement and Outcomes	*Measure: name, construct, reliability/validity, frequency* "The transcripts were analyzed using thematic content analysis to identify themes within and across transcripts. Two members of the research team reviewed the data to develop and initial set of codes. The code lists were compared, discussed and incorporated into a set of 16 codes. Transcripts were independently coded by the same two members of the research team" (p. 325). "Inter-rater reliability was calculated using ReCal2 software. The average percent agreement for all codes was 96% and the average Cohen's kappa =.076" (p. 325).
Results	*Description of the sample:* "There were 17 participants in the caregiver focus groups and 48 participants in the elder focus groups… Mean participant age was 71 years (range =48-88 years). Participants were 77% female; and 82% white, 16% black and 2% other. Approximately 95% of participants had at least a high school diploma or Generalized Education Diploma (GED) and 34% a college degree or higher. The majority of participants (77%) were retired. Nearly 98% had some form of insurance…" (p. 325). *Analysis/theme one:* "Two common barriers to medication adherence were forgetting to take the medication and/or a change in routine that resulted in failure to take the medication" (pp. 325-326). *Analysis/theme two:* "Cost was another barrier that impacted many participants" (p. 327). *Analysis/theme three:*

	"Participants identified that taking large numbers of pills was a barrier to medication management; the more pills taken per day, the more difficult it was to adhere to each medication's specific regimen" (p. 327). *Analysis/theme four:* "Another perceived barrier to medication adherence was isolation or lack of social support" (p. 329). *Analysis/theme five:* "The final perceived barrier to medication adherence discussed by participants was lack of understanding of medications, their side effects and potential drug interactions" (p. 329).
Authors' Discussion and Conclusion	*Idea one:* "Prescribing 7- to 14-day prescriptions might result in fewer unnecessary medications sitting on shelves and in medicine cabinets, thus reducing access, and potentially, the risk for abuse, of said medications" (p. 331). *Idea two:* "A second solution identified by many participants was regular review of prescribed medications… A regular review of medications could help alleviate participants' fears and concerns regarding overmedication" (p. 331). *Idea three:* "Third, participants recommended implementation of informal and formal community-based support systems to facilitate medication adherence among elders" (p. 331). *Idea four:* "Finally, the suggestion of adding a medical advocate to the healthcare team emerged repeatedly during the focus group sessions" (p. 331).
Authors' Limitations	"… utilizing snowball sampling to recruit participants could have introduced volunteer bias into the sample. The volunteers who participated may have been more engaged and vocal than a randomly selected sample" (p. 332). "Furthermore, due to the linguistic limitations of the focus group facilitator, the perspectives of non-English speaking participants were not included" (p. 332). "Our sample only included family caregivers, which may limit the applicability of our findings for professional caregivers." (p. 332) "A further limitation could be that the majority of participants had completed at least some college and may have had relatively high health literacy" (p. 332). "Another limitation may be that the interview guide was not pilot tested" (p. 332). "Finally, the study design was not intended to make comparisons between the elder focus groups and the caregiver focus groups. Rather, this was an exploratory study intended to gather as many varied perspectives as possible" (p. 332).
Authors' Implications for Practice and Future Research	"Our study suggests that interventions to improve medication adherence among elders should not only expand upon well-documented strategies, but should also incorporate informal strategies currently used by patients" (p. 332). "Further interventions should help elders maximize the use of personal systems in an effort to help elders remember to take their medication. They should also alert

	physicians of the cost associated with certain prescribing patterns so that planning can be done to reduce the cost barriers certain participants face. Finally, they should ensure that patients work with their healthcare team to review and reduce medications, both to lower cost and reduce medication regimen complexity" (p. 333). "More novel ideas to aid with medication management include expanding social support networks through community-driven support programs and introducing a medical advocate who can attend medical appointments and advise patients about medications and regimens" (p. 333).

Critical Appraisal: Using daily routines to promote medication adherence in older adults.

	Summary
APA Reference	Sanders, M. J., & Van Oss, T. (2013). Using daily routines to promote medication adherence in older adults. *American Journal of Occupational Therapy*, *67*(1), 91–99. https://doi.org/10.5014/ajot.2013.005033
Abstract	"PURPOSE. To understand the medication routines used by older adults taking four or more medications daily. METHOD. One hundred forty-nine community-dwelling older adults were interviewed about the individual routines, storage locations, equipment, and assistance that enabled their adherence to a medication regimen. A subsample of 84 older adults was observed completing one medication routine in their home environments. FINDINGS. Medication habits were embedded in mealtime, wake-up, and sleep routines for 91% of the sample. Participants developed unique, individualized behaviors for taking medications that were choreographed within broader daily routines. The primary locations for storing medications were the kitchen and bathroom. Equipment used to promote adherence was primarily pillboxes or self-made adaptations. More than 50% of the entire sample required some type of assistance related to medication adherence. IMPLICATIONS. Findings support the role of occupational therapists in collaborating with clients to develop individualized medication routines to promote medication adherence" (p. 91).
Your Focused Question and Clinical Bottom Line	*Question:* What is the biggest concern(s) regarding medication adherence in older adults? *Clinical Bottom Line:* This study shows that concerns are often individualized for each patient. The main findings indicate that the most common concerns included the need for activity-based indicators to take medication, location of medications, assistance during the medication taking process, and daily routines.
Your Lay Summary	The article looked at the way older adults use medicine and what routines they use to make sure they take medications at the appropriate time. 149 older adults were asked questions about how they take medicines and 84 of the adults were observed one time taking their medicine. The researchers found patterns from their interviews. These patterns were used to better understand the interviews. Some of this information includes most people take their medications around meal times or when they wake up and go to sleep. The study also found that a little more than half of the adults interviewed needed reminders to take their medicine. For the future this study shows that occupational therapists and other medical professionals should individualize how they help people have a routine to take their medicine. The study also encourages routines to be realistic for the people they are being created for. More research needs to be done to better understand the individual needs people have regarding taking medicine.

Your Professional Summary	The study was conducted to assess the ways older adults adhere to taking daily medications. To analyze this adherence semi-structured interviews and observations were conducted by graduate student researchers. 149 older adults between 51 and 98 years of age were asked open and closed-ended questions regarding their daily medication adherence and demographics. 84 of the 149 participants were observed conducting one medication administration with aspects such as time and environment documented. Themes were identified and placed into a chart to conduct quantitative assessments of the data. The findings report that the participants frequently centered their medication adherence around meal times and wake-up/bedtimes. The strengths of this study include the fairly large sample size assessed especially due to the age of the participants. The authors reported specific trainings for the student researchers conducting the interviews. This increased the strength of the study to decrease researcher bias. The study also has significant implications including the need for individualization of medication routines, occupational therapy's role in medication adherence, and the need for patients to have a realistic medication routine. The study is limited by a few factors. The first factor is the use of self-report and description of routines from memory. Another being the use of a significant number of researchers allowing room for error and differences in interview style. Finally the use of descriptive measures can be difficult especially with older adults.
	Critical Appraisal
Stated Purpose or Research Question	'The purpose of this study was to describe the medication adherence strategies used by a sample of community-dwelling older adults. Medication adherence strategies refer to the methods older adults use to remember the timing of medications, location, dosage, and the equipment or supports needed. The main research question was, "How do community-dwelling older adults taking four or more medications adhere to a daily medication regimen?"' (p. 92)
Background Literature	*Key points of the intro section:* "An estimated 50%–75% of all adults do not take medications properly, resulting in more than 125,000 deaths each year (Wertheimer & Santella, 2003)" (p. 91). "Many studies have examined strategies to promote medication adherence, including specialized equipment, social support, improved physician communication, medication instruction redesign, and motivational interviewing. However, systematic reviews have indicated that no strategies are deemed more effective than others (George, Elliot, & Stewart, 2008; Morrow et al., 2005; Wertheimer & Santella, 2003)" (pp. 91-92). "a cognitive retraining program did not generalize into improved ability to schedule and take medications among a sample of older adults." (p. 92) "Ryan and Wagner (2003) found that people who were HIV seropositive took medications around established daily meals, TV shows, or hourly schedules" (p. 92). "Andiel and Liu (1995) reviewed models of working memory and suggested that deficits may increase older adults' difficulty in developing and following a medication schedule" (p. 92).

	"Radomski and Davis (2002) explained that routines, defined as clusters of semiautomatic habits, increase the efficiency of regular performances because of the minimal demand on cognitive processes, such as memory and decision making (AOTA, 2008; Radomski & Davis, 2002)" (p. 92). "Although the literature has substantiated the value of daily routines for medication adherence in the general population of adults, no studies have described the unique routines established by older adults and how routines are embedded in their daily lives" (p. 92). *Theoretical perspective:* Not reported
Research Design	*Research design:* A phenomenological study using semi-structured interviews and observations of medication-taking routines *Rationale for the design:* Design helps answer question of "patient experience" *For quantitative primary research, AOTA Level of Evidence:* Not applicable, this is a qualitative study
Sampling	*Sampling method used and the rationale (if given): "*Participants were recruited through personal contact with researchers using a purposive sampling approach. Graduate and upper-level occupational therapy students in pharmacology and older adult classes from spring 2010 and 2011 collected data for the study" (p. 93). *Inclusion criteria:* 50 or older, English speaking, taking 4+ long-term medications, and living independently (home or retirement community) (pp. 92-93). *Exclusion criteria:* None reported *Power/sample size estimate:* n=149
Sample	*Number of Participants (Total and Subgroups):* This study included 149 older adults taking 4 or more medications per day. Subsample included 84 adults completing medication habits in their home environments. *Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability):* Ages 50+ (range: 51-98), race and ethnicity not reported, sample diagnoses not reported *Dropouts:* Not reported
Groups	*Types of groups: (e.g., intervention, sample characteristic):* self report and observation *Group one description:* Only participated in self-report interview *Group two description:* Participated in both the self-report interview and observation of their medication habits at home

Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review):* Interview on medication adherence and observations "open-ended questions related to participants' daily medication dosages, frequency of taking medications, cost, and self-reported adherence" (p. 93). "Closed-ended questions addressed participant demographics related to living situation, marital status, education, and perceived health, using tick lists and ordinal-level questions" (p. 93). "The semi-structured interview, participants were asked to describe their specific habits and routines for taking medications throughout the day, including the time, location, and decision-making process for choosing a location and how medication habits were embedded in their larger daily patterns" (p.93). '"How do you remember when to take your medications?" and "Can you tell me about any devices you use to help take your medications?"' (p. 93) "Each student researcher interviewed 1 older adult for 45 min–1 hr and recorded narratives for each question on an interview sheet" (p. 93). "For observations, students scripted one entire medication-taking process, including the time, environmental surroundings, location of medications, equipment, sequence of activities, broader daily routines, and personal assistance from others" (p. 93). "The first author (Martha J. Sanders) read field notes and checked for consistency with interview data, then content within categories was expanded as unique data emerged from the field notes" (p. 93). "The second author (Tracy Van Oss) blindly read the field notes, verified the additional themes, and compared her findings with those of Sanders" (p. 93). Specific procedures and trainings Descriptive statistics
Measurement and Outcomes	"Interview responses were categorized according to the following content domains: time to take medications, pill location, equipment used, broader routine, decision-making process, and assistance needed" (p. 93). "Narrative data from interviews were coded and entered into a spreadsheet under each domain" (p. 93). "Identify the frequency of each theme in the coding table and analyze it quantitatively" (p. 93).

Results	*Description of the sample:* Marital Status: 147 reported; 7 single, 86 married, 7 divorced, 47 widowed. Living Situation: 147 reported; 37 live alone, 23 live with family, 81 live with spouse, 5 live outside home with assistance, 1 other. Health rating: 144 reported; 6 poor, 19 below average, 59 average, 46 above average, 14 excellent Educational Attainment: 143 reported; 15 Junior high school, 62 high school, 22 two-year college, 20 four-year college, 24 graduate Employment: 147 reported; 102 retired, 15 part time, 30 full time Mean age: 70.42, range 51-98 *Analysis/theme one:* Timing and Location for Taking Medications

Table 2. Descriptive Information on Timing, Location, Location Decisions, and Routines Used for Medication Adherence (*N* = 149)

Descriptive Information	*n*	%
Time to take medications		
Meal based	106	71
Wake-up, sleeping routines	77	52
Specific time	13	9
Work based	7	5
Location for storing medications		
Kitchen	100	67
Bathroom	30	20
Bedroom	16	11
Family room	4	3
Location decision		
In plain sight	77	52
Based on meals	60	40
Based on morning or evening hygiene	50	34
Easily accessible	43	29
Where participant spends time	22	15
Entire routines		
Breakfast	95	64
Dinner	67	45
Morning hygiene	59	40
Evening hygiene	49	33
Lunch	37	25
Work	9	6
Nap or TV	6	4

"Older adults most commonly planned medications around mealtimes (71%, n =106) and wake-up or bedtimes (52%, n=77)" (p. 94).
"Participants made decisions about where to store or place medications on the basis of their proximity to specific daily routines, ability to see medications, and ease of reach" (p. 95).

Analysis/theme two: Assistance: Social Support and Equipment
"Fifty-one percent (n 5 80) of the sample indicated needing some type of social support in the entire process of taking medications, primarily in the form of verbal reminders and help with picking up or arranging for refills" (p. 95).
"The most commonly used device to organize pills was a weekly pillbox (65%, n 5 97), although some participants used pillboxes with a larger font, compartments for 2 wk, and varied colors to denote days. Several participants used higher-tech equipment such as a pillbox with a timer or an audio reminder or a watch with timed vibration as a reminder" (p. 95).

	Analysis/theme three: Medication Habits Embedded in Daily, Weekly, and Monthly Routines "The most common routines in which older adults embedded medications were breakfast (64%, n = 96), dinner (45%, n = 67), morning hygiene (40%, n = 59), and evening hygiene (33%, n = 49" (p. 95). "Weekly routines included counting pills, allocating them for the week, loading pill boxes, and picking up medications from the pharmacy. Many participants noted that they loaded pillboxes on Sundays" (p. 95). "Individuals in this sample reported nonadherence resulting more from not having or refilling medications than from not taking them correctly" (p. 95). *Analysis/theme four:* Interrupted Daily and Medication Routines "Medication adherence was so integral to daily routines that when routines were disrupted, medication habits were also disrupted. Medication habits were interrupted for vacations, appointments, taking a day off work, having a late meeting, sleeping late, or even going out to dinner" (p. 95).
Authors' Discussion and Conclusion	*Idea one:* "Observations of older adults' routines demonstrated the unique and individual nature of each person's medication habits and the semiautomatic sequence of activities in which the medication-taking sequence was embedded" (p. 97). *Idea two:* "In this study, preceding activities and specific locations for medications acted as direct cues for triggering the medication-taking habit ("I put my rings on and then take my medications"; "I put in the coffee filter, start the brew, and take my medications"), as proposed by Wood and Neal (2007)" (p. 97). *Idea three:* "Future research may investigate the range of behaviors in ingesting medications and, more broadly, the individualized meaning attributed to medication adherence" (p. 98).
Authors' Limitations	Use of self-report measures- allows for bias or inaccurate responses Routines described based on memory- potential for cognitive impairments to influence descriptions Interview styles of student researchers- everyone has different styles, allowing for interviewer bias Descriptive information→ hard to generalize to all older adults

Authors' Implications For Practice and Future Research	"medication habits need to be individually developed to promote realistic integration of new habits into existing life routines" (p. 97). "These findings substantiate occupational therapy practitioners' role in developing specific, individualized, concrete plans for integrating medications into daily routines" (p. 97). "Our findings suggest that occupational therapy practitioners must first collaborate with clients to identify the most realistic routine in which a medication habit can be embedded, then identify the location (or social context), and finally identify the cues that will trigger the medication habit" (p. 97).

Critical Appraisal: Intervention to improve medication management: Qualitative outcomes from a phase I randomized controlled trial.

	Summary
APA Reference	Schwartz, J. K., Grogan, K. A., Mutch, M. J., Nowicki, E. B., Seidel, E. A., Woelfel, S. A., & Smith, R. O. (2017). Intervention to improve medication management: Qualitative outcomes from a phase I randomized controlled trial. *American Journal of Occupational Therapy*, *71*(6), 1-10. https://doi.org/10.5014/ajot.2017.021691
Abstract	"OBJECTIVES. We sought to define an occupational therapy intervention to promote medication management and to evaluate the acceptability and effectiveness of the intervention. METHOD. Nineteen adults with chronic health conditions and poor medication adherence participated in a two-group, blinded, randomized study. They received either an occupational therapy or a standard care intervention. We used a qualitative method to measure participants' changes in medication management through an interview regarding participants' perceptions and behaviors. RESULTS. The occupational therapy intervention group reported greater improvements in medication management and implemented twice as many new adaptive strategies as the standard care group. Participants indicated that interventions related to advocacy, education, assistive technology, environmental modifications, self-monitoring, and good rapport were the active ingredients of the intervention. CONCLUSIONS. Occupational therapy is an acceptable intervention for medication management, and it can lead to self-perceived improvements and the adoption of new medication management behaviors. Further research is warranted" (p. 1).
Your Focused Question and Clinical Bottom Line	*Question:* What are occupational therapy interventions for medication management for adults living in the community? *Clinical Bottom Line:* An occupational therapy intervention for medication management for adults living in the community is called the Integrative Medication Self-Management Intervention. This intervention was developed by an occupational therapist and is based on theory, current practice, and best evidence. This research study found that over half of the OTIG reported that their ability to manage their medications had improved, whereas only 30% of individuals in the SCIG felt they had improved. Occupational therapy is a beneficial intervention to assist individuals in utilizing new medication management behaviors.
Your Lay Summary	The goal of this study was to examine the usefulness of an occupational therapy intervention to help individuals with medicine use and administration. The participants of the study included nineteen adults with a chronic health condition who struggle to correctly take their medications. Nine participants were part of the occupational therapy intervention group (OTIG) and ten participants were part of the standard care intervention group (SCIG). The OTIG received a 30-minute occupational therapy intervention that had clients progress through a three-step process of reflecting on their abilities to take their medications, setting up a medication goal, and generating strategies to reach their goal. The SCIG was a 30-minute pamphlet-based educational session in which individuals read the pamphlet and asked the clinician questions if

	they wanted. The participants change in medication management before and after the study were measured through an interview. The results found that individuals in the OTIG experienced more improvements in their ability to manage their medications than the standard care group. Overall, the study concluded that occupational therapy interventions focused on medication management can help individuals better administer and take their medications as prescribed.
Your Professional Summary	The objective of this study was to find and evaluate the effectiveness of an occupational therapy intervention promoting medication management. The participants of the study included nineteen adults with chronic health conditions that struggled with medication management. In this two-group, blinded, randomized study, nine participants were part of the occupational therapy intervention group (OTIG) and ten participants were part of the standard care intervention group (SCIG). The OTIG received a 30-minute intervention known as the Integrative Medication Self-Management Intervention in which the clients progressed through a three-step process of reflecting on past performance of medication management, setting up a medication goal, and generating strategies to reach the goal. The SCIG was a 30-minute pamphlet-based educational session in which the pamphlet was reviewed and questions were asked. A qualitative method was used to measure the participants changes in medication management through an interview. The results found that the OTIG had greater improvements in medication management and utilized more new strategies than the standard care group. Overall, the study concluded that occupational therapy could provide beneficial interventions to improve medication management. An implication from this study is that occupational therapists can assist clients in medication management through interventions to help them use and administer medications. A strength of this study was that the intervention was developed by an occupational therapist on the basis of theory, current practice and best evidence. However, a weakness is that there were only nineteen participants in the study. A greater sample size would have provided more generalizability.
	Critical Appraisal
Stated Purpose or Research Question	"We hypothesized that one allied health professional, the occupational therapy practitioner, can help people better manage their medications" (p. 2). "This project had three objectives: (1) evaluate the acceptability of the intervention, (2) understand whether the intervention is effective enough to warrant future research, and (3) define the intervention. Feasibility and safety have been discussed elsewhere" (p. 2).
Background Literature	*Key points of the intro section:* "Evidence suggests that many people fail to take their medications because of problems with medication management" (p. 1). "Current medication adherence interventions are complex, costly, and not very effective (Nieuwlaat et al., 2014). New interventions are needed to help people with chronic health conditions take their medications as prescribed" (p. 1).

	"At present, many physicians do not have the time or full complement of expertise in health behavior change to counsel clients in medication adherence" (p. 1). *Theoretical perspective:* "The Ecological Model for Adherence in Rehabilitation suggests that occupational therapy practitioner–client teams can modify person factors, provider factors, intervention factors, the environment, self-determination, and knowledge to improve adherence" (p. 1).
Research Design	*Research design:* "Nineteen adults with chronic health conditions and poor medication adherence participated in a two-group, blinded, randomized study. They received either an occupational therapy or a standard care intervention. We used a qualitative method to measure participants' changes in medication management through an interview regarding participants' perceptions and behaviors" (p. 1). *Rationale for the design:* "To test our hypothesis, we began with a Phase I study. The goals of a Phase I study are to define the intervention and evaluate its acceptability, feasibility, and safety" (p. 2). A randomized controlled trial was the appropriate design to use to compare the control group and the experimental group. In this study it was looking at the effectiveness of the occupational therapy intervention group compared to the standard care group. *For quantitative primary research, AOTA Level of Evidence:* Level II
Sampling	*Sampling method used and the rationale (if given).* "We purposefully sampled persons with chronic health conditions and poor medication adherence" (p. 2). "There was no relationship established with the participants before the study, except for 3 participants who were students at the university where the study was conducted" (p. 2). *Inclusion criteria:* "To be included in the study, participants were required to be adults diagnosed with a chronic health condition, on a medication regimen of five or more medications, who live in the community and independently manage their medications. They were required to indicate poor medication adherence" (p. 2). *Exclusion criteria: "*People were excluded from the study if they demonstrated significant cognitive impairment (indicated by a score of 10 or more on the Short Blessed Test; Katzman et al., 1983)" (p. 2). *Power/sample size estimate:* Not reported
Sample	*Number of Participants (Total and Subgroups):*

	"Nineteen participants with chronic health conditions completed the study: 9 in the OTIG and 10 in the SCIG" (p. 5). OTIG = occupational therapy intervention group SCIG = standard care intervention group *Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability):* "Participants tended to be nonworking, older, female, White, and insured. Participants often had more than one chronic health condition. Those assigned to the SCIG reported conditions including heart disease (n=6), anxiety (n=4), depression (n=3), arthritis (n=2), asthma (n=2), diabetes (n=1), chronic obstructive pulmonary disease (n=1), and stroke (n=1). Participants assigned to the OTIG reported conditions including arthritis (n=6), diabetes (n=5), depression (n=4), heart disease (n=3), asthma (n=2), anxiety (n=1), HIV (n=1), osteoporosis (n=1), and stroke (n=1)" (p. 5). *Dropouts:* One participant dropout.
Groups	*Types of groups: (e.g., intervention, sample characteristic):* *Group one:* occupational therapy intervention group *Group two:* standard care intervention group *Group one description:* "In the RCT, half of the participants received an occupational therapy intervention designed to help them develop new habits and routines to promote medication adherence" (p. 2). *Group two description:* "The other half of the participants received a pamphlet-based educational session on medication management" (p. 2).
Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review)* "At the end of the study, participants were interviewed about their experiences. For Objective 1 (acceptability), participants described their perceived need for additional medication management services during regular doctors' visits. For Objective 2 (effectiveness), participants indicated effectiveness of the intervention in four ways: (1) self-perceived improvements in the ability to manage medications, (2) the magnitude of the self-perceived improvements, (3) quantitative improvements in adherence, and (4) the number of behavioral changes implemented after intervention. For Objective 3, participants were asked to describe the intervention in their own words" (p. 2).
Measurement and Outcomes	"At baseline, each participant filled out a demographics questionnaire, indicating his or her health condition(s), age, race, sex, health insurance status, relationship status, and employment status. Participants were also trained to complete medication diaries. Each day, participants recorded the time and number of medications consumed. This information was used to triangulate participants' perceptions of medication adherence with their actual medication adherence. At the conclusion of the study, all participants completed a brief semi-structured exit interview" (p. 3).

Results	*Description of the sample:* "Nineteen participants with chronic health conditions completed the study: 9 in the OTIG and 10 in the SCIG. Participants tended to be nonworking, older, female, White, and insured. Participants often had more than one chronic health condition. Those assigned to the SCIG reported conditions including heart disease (n=6), anxiety (n=4), depression (n=3), arthritis (n=2), asthma (n=2), diabetes (n=1), chronic obstructive pulmonary disease (n=1), and stroke (n=1). Participants assigned to the OTIG reported conditions including arthritis (n=6), diabetes (n=5), depression (n=4), heart disease (n=3), asthma (n=2), anxiety (n=1), HIV (n=1), osteoporosis (n=1), and stroke (n=1)" (p. 5).

Table 3. Demographic Characteristics of the Participants

Variable	SCIG, *M* (*SD*) or *n* (%)	OTIG, *M* (*SD*) or *n* (%)
Age, yr	56.00 (21.00)	61.00 (11.00)
Daily medications	9.00 (3.00)	11.00 (3.00)
Prescribers	3.00 (1.00)	3.00 (2.00)
Chronic health conditions	4.00 (3.00)	3.00 (1.00)
Short Blessed Test score	2.00 (2.00)	0.89 (1.05)
Female	7 (70)	6 (67)
Race, White	10 (100)	8 (89)
Relationship status		
Single, divorced, or widowed	7 (70)	4 (44)
Married or in a relationship	3 (30)	5 (56)
Employment status		
Employed	1 (10)	1 (11)
Unemployed	1 (10)	1 (11)
Student	2 (20)	0 (0)
Retired	5 (50)	4 (45)
Disabled	1 (10)	3 (33)

Note. OTIG = occupational therapy intervention group ($n = 9$); SCIG = standard care intervention group ($n = 10$).

Analysis/theme one:
"All participants in the OTIG and 90% of participants in the SCIG indicated that additional medication management services would be beneficial" (p. 6).

Analysis/theme two:
"Effectiveness of the intervention was described by participants' self-perceived changes in medication management. Fifty-five percent (n 5 5) of OTIG participants indicated that their ability to manage their medications had improved, but only 30% (n=3) of SCIG participants felt they had improved. The remaining participants indicated they had stayed the same" (p. 6).

Analysis/theme three:
"Participants in the SCIG identified six aspects of the standard care intervention as helpful: (1) awareness, (2) being listened to, (3) information, (4) caring, (5) feedback, and (6) validation. Most participants in the SCIG reported being more aware of medications" (p. 6).

Authors' Discussion and Conclusion	*Idea one:* "Our results suggest that almost all participants (n=18, 95%) believed that additional services are needed to help people manage their medications" (p. 7). *Idea two:* "The findings revealed that intervention facilitated new medication management habits and routines" (p. 7). *Idea three:* "Through interviews, the research team compared the intended intervention components with those perceived by the participants and found that many intervention components were received as delivered" (p. 7).
Authors' Limitations	"This study describes the experiences of a purposeful yet biased sample of 19 people with chronic health conditions. At this time, the results cannot be generalized to other people or settings" (p. 8). "Additional research is also warranted for the IMedS intervention. IMedS successfully met the criteria for a Phase I study and will benefit from Phase 2 research. Specifically, IMedS should progress to future studies with larger, more diverse samples; longer follow-up periods; and settings with higher external validity. Research is also needed to determine optimal dose and frequency of this behavioral intervention. In addition, future investigations should account for changes in functional outcomes and overall health" (p. 8).
Authors' Implications For Practice and Future Research	"Occupational therapy practitioners can help clients improve their medication management through interventions related to advocacy, education, assistive technology, environmental modifications, and self-monitoring. Good rapport and therapeutic communications skills help occupational therapy practitioners deliver skilled interventions that enable clients to self-generate and implement solutions to their occupational performance deficits" (p. 9).

Critical Appraisal: Scoring, clinical utility, and psychometric properties of the in-home medication management performance evaluation (HOME–Rx).

	Summary
APA Reference	Somerville, E., Massey, K., Keglovits, M., Vouri, S., Hu, Y.-L., Carr, D., & Stark, S. (2019). Scoring, clinical utility, and psychometric properties of the in-home medication management performance evaluation (HOME–Rx). *American Journal of Occupational Therapy*, *73*(2), 1-8. https://doi.org/10.5014/ajot.2019.029793
Abstract	"Importance: Forty percent to 75% of community-dwelling older adults are not able to adhere to their medication routine. A medication management assessment can correctly identify the reasons for nonadherence and the barriers contributing to it. Objective: To further develop the HOME–Rx, an in-home medication management assessment, by modifying scoring metrics, improving clinical utility, and establishing psychometric properties. Design: In Phase 1, the scoring metrics were modified, and the clinical procedures were evaluated. In Phase 2, the psychometric properties were established. Setting: The homes of older adults. Participants: Older adults who took three or more medications, managed their own medications, and lived in their own home were eligible. Older adults with cognitive impairment were ineligible. Outcomes and Measures: We assessed concurrent validity with the Performance Assessment for Self-Care Skills (PASS) and Medication Management Instrument for Deficiencies in the Elderly (MedMaIDE) and established interrater reliability. Results: The PASS was positively correlated with the HOME–Rx Performance and Safety subscales; the MedMaIDE was negatively correlated with the HOME–Rx Performance subscale and positively correlated with the Barriers subscale. Interrater reliability was excellent (ICCs = .87–1.00). Conclusions and Relevance: All relationships were as predicted: The HOME–Rx is a valid and reliable performance-based assessment that provides clinicians and researchers with a measure of older adults' actual medication management ability in the home using their medications. The results can potentially be used to guide treatment planning and improve medication management. What This Article Adds: Occupational therapy practitioners can use the HOME–Rx to adequately determine performance problems, safety concerns, and environmental barriers and potentially to guide treatment planning and improve medication management for older adults" (p. 1).

Your Focused Question and Clinical Bottom Line	*Question*: How can an OT assess medication management/adherence in older adults to provide the most effective treatment plan? *Clinical Bottom Line*: An OT can use the HOME-Rx assessment tool to accurately identify any factors that could lead to/cause medication mismanagement in older adults who live in their home.
Your Lay Summary	The goal of this study was to determine the effectiveness of an assessment tool looking at medication adherence in older adults. This assessment tool is unique in the fact that it allows the assessment to take place in the older adults home environment. For this study, there were two phases. In phase one, the researchers focused on four participants to modify and revise the assessment tool (HOME-Rx). The researchers were able to establish the scoring and reduced the administration time of the assessment from 65-75 min to 25-35 min. In phase two of the study, the researchers recruited 30 older adult participants. Two occupational therapists assessed their medication adherence using the HOME-Rx assessment tool. Based on their modifications to the assessment tool, their results were able to conclude that the HOME-Rx assessment is both reliable and valid. The assessment tool specifically looks for risk factors that could lead to medication mismanagement. One limitation that I identified in this study was their small sample size of only 30 participants in phase two.
Your Professional Summary	Medication management/appearance is a significant issue as medications are used as a standard intervention for several conditions. Especially in the older adult population, medication mismanagement has become a common issue that occupational therapists can address. This study focused on two objectives. The first objective is the refinement process of the HOME-Rx assessment tool used for assessing medication adherence in older adults who live at home. The second objective was to test the accuracy of the assessment tool on participants. Therefore, the design of this study included two phases. Phase one included two occupational therapists and four older adult participants to refine the HOME-Rx. Phase two included 30 participants who participated in the assessment given by two occupational therapists. This assessment tool showed positive reliability and validity results and allowed older adults to be assessed in their natural environment. And phase one of the study allowed for refinements that improved the administration process. Although this study provides for administration in the home, it cannot be used in a clinic setting. Assessing an older adult's medication adherence is essential before they are discharged. Also, this study had a very small sample size of 30 participants for phase two who lacked diversity.
	Critical Appraisal

Stated Purpose or Research Question	"The purpose of this study was to further develop the HOME–Rx by modifying the scoring metrics, improving its clinical utility, and establishing additional psychometric properties. We hypothesized that the changes to the HOME–Rx would result in a clinically useful, psychometrically sound instrument to be used to measure medication management ability among community-dwelling older adults" (p. 2).
Background Literature	*Key points of the intro section:* "Correctly identifying the reasons for nonadherence and the barriers contributing to it is essential to improving adherence outcomes and can be done through a medication management assessment" (p. 2). "To fill this gap, we developed the In-Home Medication Management Performance Evaluation (Home–Rx), a performance-based medication management assessment to be used in the homes of community-dwelling older adults to assess ability to manage medication routines in context, identify risk factors for medication management problems, and identify the environmental barriers influencing medication management ability" (p. 2). *Theoretical perspective:* Not reported
Research Design	*Research design:* Validation study of psychometric properties of a tool *Rationale for the design:* Not reported. *For quantitative primary research, AOTA Level of Evidence:* Level three
Sampling	*Sampling method used and the rationale (if given).* "To identify participants for Phase 1, occupational therapy practitioners at Washington University identified a convenience sample of participants from the research laboratory's community advisory board" (p. 3). "Older adults in the St. Louis, Missouri, area who were prescribed three or more medications, managed their own medication routine, and lived in their own home were eligible to participate" (p. 3). "A variety of recruitment methods were used, including contact with previous research study participants, flyers distributed at exercise groups for older adults, and word of mouth" (p. 4). *Inclusion criteria:* Older adults over the age of 65. *Exclusion criteria:* "Those with cognitive impairment indicated by a score greater than 10 on the Short Blessed Test (Katzman et al., 1983) were ineligible" (p. 3). *Power/sample size estimate:* Not reported.

Sample	*Number of Participants (Total and Subgroups):* Phase 2: 30 older adults Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability): Phase 1: "Revisions to the HOME–Rx were pilot tested by two occupational therapy practitioners in the homes of four community- dwelling older adults who had a mean age of 73.8 yr, 50% of whom were female, and the majority of whom were White (75%). They took an average of 9.7 prescription medications" (p. 4). *Dropouts*: N/A
Groups	*Types of groups*: (e.g., intervention, sample characteristic): *Group one description*: Phase 1 group- "Revisions to the HOME–Rx were pilot tested by two occupational therapy practitioners in the homes of four community- dwelling older adults who had a mean age of 73.8 yr, 50% of whom were female, and the majority of whom were White (75%). They took an average of 9.7 prescription medications" (p. 4). *Group two description:* Phase 2 group- 30 older adults
Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review):* NO INTERVENTION Tested the effectiveness of assessment Phase one: Trial of 4 people "Revisions to the HOME–Rx were pilot tested by two occupational therapy practitioners in the homes of four community-dwelling older adults" (p. 4). Phase two: Administration of assessment

Measurement and Outcomes	"Data analysis was completed using IBM SPSS Statistics (Version 23; IBM Corp., Armonk, NY). Demographic characteristics of the participants were calculated using descriptive statistics. Correlations between the total MedMaIDE score and the Performance and Barriers subscales of the HOME–Rx, as well as correlations between the Performance and Safety scores of the Medication Management subscale of the PASS and the Performance and Safety subscales of the HOME–Rx, were computed to determine the concurrent validity of the HOME–Rx. All correlations were calculated using Pearson's correlation coefficient (Portney & Watkins, 2009)" (p. 5). "Interrater reliability was determined by calculating intraclass correlation coefficients (ICCs) comparing scores between the trained raters. Shrout and Fleiss's (1979) Model 2 was used, which assumes that all participants are assessed by the same raters, who are considered representative of a larger population. According to Shrout and Fleiss's criteria, agreement is considered excellent when the ICC > .75, whereas ICCs <.75 indicate moderate to poor reliability" (p. 5). Measure (Phase two): "The PASS was positively correlated with the HOME–Rx Performance subscale ($r = .57$, $p < .001$) and Safety subscale ($r = .49$, $p < .001$). The MedMaIDE was negatively correlated with the HOME–Rx Performance subscale ($r = -.69$, $p < .001$). The MedMaIDE was positively correlated with the HOME–Rx Barriers subscale ($r = .70$, $p < .001$)" (p. 5).

Results	Phase one: "Revisions to the HOME–Rx were pilot tested by two occupational therapy practitioners in the homes of four community-dwelling older adults who had a mean age of 73.8 yr, 50% of whom were female, and the majority of whom were White (75%). They took an average of 9.7 prescription medications. The assessment was administered until a consensus on the scoring and formatting was reached by all members of the research team. The scoring scales were established, and because of the changes to the formatting of the HOME–Rx, administration time was reduced from an average of 65 to 75 min to 25 to 35 min. Finally, we evaluated the effectiveness of the MR ROSS tool in helping therapists identify missing medications. All four participants omitted medications when asked to create a list, but after using MR ROSS the therapists identified a mean of 2.5 additional medications for each participant" (p. 4). Phase two: "Descriptive statistics for the participants in Phase 2 are provided in Table 1. We addressed concurrent validity by examining correlations among the HOME–Rx, PASS, and MedMaIDE. We hypothesized that the Performance and Safety subscales of the Medication Management Assessment section in the HOME–Rx would be positively correlated with the Performance and Safety scores from the Medication Management subscale of the PASS and that the Performance subscale would be negatively correlated with the MedMaIDE. In addition, we hypothesized that the Barriers subscale of the HOME–Rx would be positively correlated with the MedMaIDE. The PASS was positively correlated with the HOME–Rx Performance subscale ($r = .57$, $p < .001$) and Safety subscale ($r = .49$, $p < .001$). The MedMaIDE was negatively correlated with the HOME–Rx Performance subscale ($r = -.69$, $p < .001$). The MedMaIDE was positively correlated with the HOME–Rx Barriers subscale ($r = .70$, $p < .001$)" (p. 5).
Authors' Discussion and Conclusion	*Idea one*: "The HOME–Rx fills a gap in medication management assessments for community-dwelling older adults because it is conducted in the homes of older adults with their own medications and identifies the individual's barriers to medication management" (p. 6). *Idea two:* "The HOME–Rx is a new assessment tool with excellent validity and reliability that was designed to determine the risk factors for medication mismanagement in older adults, assess the ability of older adults to correctly and safely complete their medication management routine, and measure the severity of environmental barriers' impact on medication management tasks" (p. 6). *Idea three:* "The addition of MR ROSS to the HOME–Rx was valuable in that it increased the accuracy of medication recall" (p. 6).

Authors' Limitations	"Although the HOME–Rx has many strengths, it does have limitations. One potential limitation is that because it is performance based and uses the older adult's own medication, it can be administered only in the home. The HOME–Rx is not designed to be a screening tool used by a doctor or therapist when an individual is being discharged back home (e.g., MedMaIDE). This limits the settings in which the HOME–Rx can be used; however, a performance-based, in-home assessment is always preferred (Golant, 2003) when the situation allows. The HOME–Rx shows excellent potential for measuring change in Performance, Safety, and Barriers scores; however, the sensitivity of the subscales to detect a change in medication management is unknown. Finally, the sample for this study lacked heterogeneity. More studies in other samples with more diversity would be helpful in determining the assessment's usefulness in a broader population" (p. 6).
Authors' Implications For Practice and Future Research	"The HOME–Rx is a valid, reliable performance-based assessment, and the results of this study have the following implications for occupational therapy practice: The HOME–Rx provides occupational therapy clinicians and researchers with a measure of actual medication management ability in the home using the older adult's medications. The HOME–Rx can potentially guide occupational therapy practitioners when planning a medication management intervention by identifying specific barriers to performance, allowing the practitioners to develop a comprehensive treatment plan to eliminate barriers to successful medication management" (p. 7).

Critical Appraisal: Supporting the medication adherence of older Mexican adults through external cues provided with ambient displays: Feasibility randomized controlled trial.

	Summary
APA Reference	Zárate-Bravo, E.,García-Vázquez, J.P., Torres-Cervantes, E., Ponce, G., Andrade, A.G., Valenzuela-Beltrán, M., & Rodríguez, M.D. (2020). Supporting the medication adherence of older mexican adults through external cues provided with ambient displays: feasibility randomized controlled trial. *JMIR mHealth and uHealth*, 8(3), 1-17. http://mhealth.jmir.org/2020/3/e14680/
Abstract	"Background: Problems with prospective memory, which refers to the ability to remember future intentions, cause deficits in basic and instrumental activities of daily living, such as taking medications. Older adults show minimal deficits when they rely on mostly preserved and relatively automatic associative retrieval processes. On the basis of this, we propose to provide external cues to support the automatic retrieval of an intended action, that is, to take medicines. To reach this end, we developed the Medication Ambient Display (MAD), a system that unobtrusively presents relevant information (unless it requires the users' attention) and uses different abstract modalities to provide external cues that enable older adults to easily take their medications on time and be aware of their medication adherence. Objective: This study aimed to assess the adoption and effect of external cues provided through ambient displays on medication adherence in older adults. Methods: A total of 16 older adults, who took at least three medications and had mild cognitive impairment, participated in the study. We conducted a 12-week feasibility study in which we used a mixed methods approach to collect qualitative and quantitative evidence. The study included baseline, intervention, and postintervention phases. Half of the participants were randomly allocated to the treatment group (n=8), and the other half was assigned to the control group (n=8). During the study phases, research assistants measured medication adherence weekly through the pill counting technique. Results: The treatment group improved their adherence behavior from 80.9% at baseline to 95.97% using the MAD in the intervention phase. This decreased to 76.71% in the postintervention phase when the MAD was no longer being used. Using a one-way repeated measures analysis of variance and a post hoc analysis using the Tukey honestly significant difference test, we identified a significant statistical difference between the preintervention and intervention phases (P=.02) and between the intervention and postintervention phases (P=.002). In addition, the medication adherence rate of the treatment group (95.97%) was greater than that of the control group (88.18%) during the intervention phase. Our qualitative results showed that the most useful cues were the auditory reminders, followed by the stylized representations of medication adherence. We also found that the MAD's external cues not only improved older adults' medication adherence but also mediated family caregivers' involvement. Conclusions: The findings of this study demonstrate that using ambient modalities for implementing external cues is useful for drawing the attention of older adults to remind them to take medications and to provide immediate awareness on adherence behavior" (p. 1).

Your Focused Question and Clinical Bottom Line	*Question:* What are some strategies to improve medication adherence in older adults? *Clinical Bottom Line:* Medication adherence in older adults can be improved with the use of external cues that either remind the client to take medication, help them recognize if medications were recorded as taken, or provide immediate and abstract representations of their medication adherence.
Your Lay Summary	Older adults often forget to take medicine due to memory changes in old age. This study gathered 16 Mexican older adults who had been forgetting to take their medicine. 8 people were randomly assigned to the control group. 8 people were randomly assigned to the treatment group, who used the MAD system. The MAD system is a tablet-based system that helps older adults remember to take their medicine in three different ways. The first way involves a cartoon parakeet that begins as an egg, and grows to become a full-size parakeet after the older adult has taken all their medicines by the end of the day. The second way involves marking a medicine label as 'completed' on the tablet. Lastly, the parakeet provides pictures and whistles to remind the older adult to take their medicine. Medicine use was measured using pill counting and a personal survey. Caregiver interviews were completed before MAD system use, and interviews with the older adult were completed after using the MAD system. Results showed that adults using the MAD system remembered to take their medicines more. Interviews suggested that the older adults and their caregivers enjoyed the system. After the MAD was taken away, the older adults had problems remembering to take their medicines again.

Your Professional Summary	Older adults often fail to take their medications properly due to age-related memory changes and dementia-like symptoms. The objective of this study was to examine the adherence and experience of older adults receiving the medication ambient display system (MAD) using external cues and caregiver support. The study was a Level I, randomized controlled trial which recruited 16 older adults with mild cognitive impairment from Mexico. Participants were randomly assigned to either the control group, which received no intervention except weekly monitoring by research assistants, or the treatment group, which was given the MAD system intervention. The MAD system is a tablet-based application that helps older adults adhere to their medications using abstract representations, auditory and visual reminders, and scanning and logging medications taken. Results showed that the treatment group's adherence improved after using the MAD system. After it was removed, their adherence rate declined again. The treatment group had higher compliance rate outcomes compared to the control group, yet no statistical significance was found. Thematic analysis from the interviews concluded that the caregivers enjoyed the system and did not find it overwhelming. Strengths included the MAD system's approaches, intervention implementation which included patient education on how to use the system, the randomization of the groups, and the mixed-methods measures. Weaknesses include the time frame of the study, number of participants, limited diversity, and human error regarding the pill counting technique. Future practice should incorporate the MAD external cues into daily routines and contexts instead of specific times of day. Research with a larger and more diverse array of participants is suggested.
	Critical Appraisal
Stated Purpose or Research Question	"Our study aimed to address the following research questions (RQ): RQ1: What is the effect of the external cues provided by the MAD [medication ambient display] on older adults' medication adherence? RQ2: How do the MAD design features promote its adoption?" (p. 2)
Background Literature	*Key points of the intro section:* Older adults commonly have issues with medication adherence due to forgetfulness Previous research has shown external cues to be beneficial in promoting medication adherence for older adults Some of these external cues in previous research included SMS text messages, medication management apps for mobile phones, and commercial telehealth medication-dispensing device Newer research is looking at: 1. MoviPill mobile phone game, which awards seniors when they take their medications. 2. dwellSense peripheral display system, which gives feedback on medication-taking behaviors to encourage reflection and self-efficacy. 3. The Conversational Medication Assistant for Heart Failure (CARMIE), which gives information on regimens and adverse drug effects. 4. The Electronic Medication Management Assistant, which offers the ability to chat with and coach clients on medication information.

	The researchers in this study created the Medication Ambient Display (MAD), which uses pictures, sounds, and movement to provide external cues guiding older adults to take their medication. *Theoretical perspective:* Not reported.
Research Design	*Research design:* Mixed-methods feasibility randomized controlled trial *Rationale for the design: "*We assessed the effect of our approach by using objective medication adherence measures; moreover, we obtained qualitative findings that help us understand the adoption of the MAD" (p. 2). *For quantitative primary research, AOTA Level of Evidence:* Level I: Randomized controlled trials
Sampling	*Sampling method used and the rationale (if given).* Conducted in Mexicali, Mexico 10 research assistants from the Faculty of Nursing at the Universidad Autonoma de Baja California were involved These research assistants were enrolled in a program called the Community Center of the University (UNICOM) UNICOM is situated in a neighborhood in which a plethora of older adults live "For recruiting participants, research assistants contacted older adults in the vicinity of the UNICOM and administered a set of instruments…" (p. 3). *Inclusion criteria:* "…be older than 60 years, take at least 3 medications prescribed by a physician (ie, polypharmacy), have mild cognitive impairment, report medication-forgetting events, and live with a relative who could provide us with information on the assistance required by the study participant to take their medication" (p. 3). *Exclusion criteria:* "…being unable to self-administer medications due to a functionality problem or sever cognitive impairment, and not taking pill-based medications (it may be difficult to assess adherence otherwise)" (p. 3). *Power/sample size estimate:* Not reported
Sample	*Number of Participants (Total and Subgroups):* 16 older adults: 12 females and 4 males 8 randomly assigned to control, 8 randomly assigned to treatment *Characteristics of the Sample (Gender, Race/Ethnicity, Diagnosis/Disability):* Control group: 5 females and 3 males Treatment group: 7 females and 1 male Mean age: 73.5 years (control group), 68.6 years (treatment) Mean education: 5.25 years (control), 6.75 years (treatment)

	Mean number of medications: 5.75 (control), 4.88 (treatment) All participants were Mexican older adults that reside in Mexicali, Mexico "Once the participants were recruited, we realized that they were primarily of low socioeconomic status and affiliated with the Mexican Institute of Social Security (IMSS), the largest medical institution in Mexico" (p. 4). *Dropouts:* "The research assistants contacted approximately 100 older adults to participate in the study (see Figure 8). They identified 42 potential participants; 20 of them met the eligibility criteria and were enrolled in the study. However, only 16 completed the study" (p. 8). Only 16 people (instead of 20 people) completed the study because: 1 person was excluded due to conflict of interest in the pre-intervention phase 1 person in the treatment group left the study during the intervention phase 1 person in the control group decided not to participate during the intervention phase 1 person in the control group had health problems during the intervention phase.
Groups	*Types of groups: (e.g., intervention, sample characteristic:* Two groups were identified; the treatment group (TG), which received the MAD intervention, and the control group (CG), which did not receive the intervention. The groups were assigned through random and blind allocation. *Group one description:* TG 8 participants randomly assigned 7 females and 1 male Mean age of 68.6 years of age *Group two description:* CG 8 participants randomly assigned 5 females and 3 males Mean age of 73.5 years of age
Method	*Primary methods to answer research question (e.g., intervention, interview, survey, chart review)* *Quantitative:* The Medication Ambient Display (MAD) system was used as the intervention in the TG. The MAD system was implemented on Android tablets. It provided these cues: "Abstract and stylized representations of their medication adherence Auditory and visual reminders to call older adults' attention Events that may enhance older adults' awareness about whether the medication was taken" (p. 5). Abstract and stylized representations of medication adherence: "…is an animation of a parakeet that symbolizes daily medication compliance. Each day, a newborn pet grows

	to represent medication compliance. In addition, by touching any point on the virtual cage of the parakeet, the MAD presents detailed information on the individual's daily medication compliance" (p. 5). Auditory and visual reminders: "The parakeet provides auditory reminders (ie, parakeet whistle) and pictograms that inform how to take medications" (p. 6). Enhance awareness of whether the medication was taken: "…after an individual takes their medication, they move the tablet closer to the pill container to indicate that the medication was taken. We implemented this functionality through Near Field Communication (NFC) technology. Afterward, the parakeet acknowledges that the medication was registered as taken" (p. 6). *Qualitative:* Caregiver interviews and patient interviews were used to determine the adoption of the system by participants.
Measurement and Outcomes	Measurement tools : *Recruitment phase:* SPMSQ : mental status questionnaire MedMaIDE: "assess if the participants had deficiencies in managing medications and whether they met the polypharmacy criteria" (p. 4). MAQ-8: Examines adherence for medicating. "We selected this instrument because it is the quickest scale to administer, the simplest to score, and has been validated in many populations with different diseases and in persons with low literacy" (p. 4). A review of the validity and reliability of the measurement tools was not included. A secondary review should be used to determine this information. Caregiver interview: "relatives of older adults were interviewed to identify their role in helping older adults follow their medication routine" (p. 4). *Preintervention phase:* Pills counting: "Baseline data were collected during weeks 6 to 10 on medication adherence by using the pill counting technique" (p. 4). Researchers would count how many pills were left in a prescription bottle compared to how many pills should be left, indicating if an older adult had taken the correct amount of medication. Caregiver interview: See above *Intervention phase (TG only):* Pills counting: See above System use interview: Identifies if the patient understands how to use the MAD system. MAQ-8: look above for description

	Intervention phase (CG only): Pills counting: See above MAQ-8: look above for description *Postintervention phase:* Pills counting: See above Exit interview: Assesses the participant's experience with the MAD system. Outcome measures: *Quantitative:* "Medication compliance (known as adherence as well) refers to "the act of conforming to the recommendations made by the provider concerning timing, dosage, and frequency of medication-taking" [27]. On the basis of this definition, we identified a set of variables as relevant for analyzing the effect of the external cues provided by the MAD on the participants' medication adherence" (p. 8). *Qualitative:* "We interviewed the older adults in the TG regarding the system's functionalities that they perceived as most useful, less useful, and the difficulties faced while using it. At the end of the postintervention stage, we interviewed participants to obtain their perceptions of how withdrawal from the MAD impacted their medication adherence. In addition, those caregivers who were at home during our visits were interviewed to obtain information on their involvement in the seniors' medication activities. Our questions centered on the specific activities associated with the older adult's medication regimen that caregivers were involved in and how they knew if the older adult took his or her pills in a given week" (p. 8).
Results	*Description of the sample:* 100 older adults were recruited for the study; only 42 met eligibility criteria, and then 22 more were excluded due to other reasons. This left only 20 participants eligible. 1 more was excluded during the pre-intervention phase due to conflict of interest. 4 were excluded during the intervention phase, leaving only 16 participants to complete the study. More characteristics described from the Results section of the article can be found in the 'Sample' and 'Groups' columns to the left. *Analysis/theme one:* Adherence to Medication (Research Question 1) MAD's external cues improved the TG's rates of dosage outcomes. Medication underadherence and overadherence were both identified throughout the study. The TG's medication adherence improved from 80.9% up to 95.97% after the intervention. It decreased postintervention after the MAD system was taken away. There was statistical significance between preintervention and intervention phases (p=.02) as well as intervention and postintervention phases (p=.002).

	The CG's medication adherence improved from 79.87% up to 88.18% after the intervention phase. However, there is not a statistical significance (p=.14). This was hypothesized to be due to weekly medication monitoring by the research assistants. The TG had a higher rate of medication adherence (95.97%) than the CG (88.18%) during the intervention phase. However, there was no statistical significance (p=.08). The reminder dependency rate was very high for all participants, ranging from 93.64% up to 100%. This suggests that MAD reminders result in medication-taking behaviors consistently. *Analysis/theme two:* System Adoption (Research Question 2) Most useful cues were auditory reminders, then stylized representations of medication adherence. Findings are supported by high rates in timely and reminder dependency measures. Some participants did not realize that they forgot to take their medications (before MAD). MAD should incorporate medications into a daily routine. Leaving home and traveling negatively impact medication adherence. External MAD cues also acted as triggers for caregiver assistance, and they were not overwhelming.
Authors' Discussion and Conclusion	*Idea one:* "Our quantitative results show that providing the external cues supported by the MAD resulted in significant improvements in the average rates of dosage outcomes for older adults" (p. 11). *Idea two:* *"*We hypothesized that including adaptation mechanisms to the MAD that allow seniors to configure external cues to remind them to take medications in a specific context instead of a specific window of time would allow that medication to be integrated into their daily routine. For instance, if an older adult proposes to take their medications when preparing his or her coffee in the morning, the MAD could include cues to help them remember to associate their medication with that activity" (p. 12). *Idea three:* "Therefore, providing external cues through ambient displays helps family caregivers to better support seniors to follow their medication regimens" (p. 12).
Authors' Limitations	"The use of financial incentives has been questioned because they may provide inducements to participate in a study for financial purposes only, and vulnerable populations are prone to be enticed by the financial reward and be more willing to accept any study risks" (p. 12). "The design of our study was limited in that the MAD system was personalized according to the prescribed medication regimens and timetables that the participants followed. Although using our technology did not introduce any risk, it might have supported inappropriate medication routines adopted by older adults to overcome some of the barriers imposed by the setting" (p. 12).

	"Finally, we are not able to state that our results are generalizable to the whole Mexican elderly population. This is because participants were primarily from a low-income socioeconomic stratum; therefore, exploring this technology among high-income elders who have access to private health care services might produce different findings" (p. 12). Generalizability may also be difficult because the study had an unequal ratio of women and men as study participants. "The pill counting technique can be prone to human error. So, one limitation of this study is that we were not able to identify which overmedication and undermedication events were registered by the research assistants erroneously. Using electronic monitoring devices (EMDs), such as the Medication Event Monitoring System, could have overcome this limitation to some extent, although using EMDs does not guarantee that a person has taken their medication [39]. Moreover, the cost of EMDs and the logistics of integrating them within clinical protocols may be limiting factors to their adoption for research in clinical contexts" (p. 12). "Another limitation of the study is its duration. Some research works have identified that older adults should have an adaptation period to an intervention, and after a specific period of using it, reliable data can be collected to measure its effectiveness for improving medication compliance" (p. 12-13).
Authors' Implications For Practice and Future Research	"For future work, we plan to conduct studies to assess the feasibility of external ambient cues to support the seamless integration of medication regimens into the daily routines of the elderly" (p. 14).

Review of Research Studies

Critical Appraisal: Effectiveness of health promotion, management, and maintenance interventions within the scope of occupational therapy for community-dwelling older adults: A systematic review.

	Summary
APA Reference	Berger, S., Escher, A., Mengle, E., & Sullivan, N. (2018). Effectiveness of health promotion, management, and maintenance interventions within the scope of occupational therapy for community-dwelling older adults: A systematic review. *American Journal of Occupational Therapy, 72*(4), 1-10. http://dx.doi.org/10.5014/ajot.2018.030346
Abstract	"OBJECTIVE. This systematic review examined the effectiveness of health promotion, management, and maintenance interventions within the scope of occupational therapy to improve occupational performance and quality of life (QOL) and decrease health care utilization for community-dwelling older adults. METHOD. Thirty-eight articles representing 36 studies were included in the review. Articles were published 2008–2015 and described studies of participants with a mean age of 65 or older who were living in the community. RESULTS. Strong evidence supports the use of group, individual, or a combination of group and individual interventions to improve occupational performance. Group interventions were also effective at improving QOL. The evidence was insufficient that any of these interventions decreased health care utilization. CONCLUSION. Addressing health promotion, management, and maintenance is within the scope of occupational therapy practice and has been shown to improve occupational performance and QOL for older adults. Implications for practice and future research are discussed" (p. 1).
Your Focused Question and Clinical Bottom Line	*Question:* What health promotion, maintenance, and management occupational therapy interventions are effective for community-dwelling older adults? *Clinical Bottom Line:* Group and individual interventions can improve occupational performance and quality of life. These group or individual interventions could be CDSMP, mCDSMP, or other group programs.
Your Lay Summary	This paper wanted to find ways to improve the lives of older adults. There were 36 studies reviewed. All studies included older adults living in the community. Older adults living in the community included retirement homes or assisted-living homes. All studies had older adults with a minimum average age of 65 years old. The results showed that group or individual activities could improve the quality of life of older adults. Occupational performance can also be improved by group or individual activities. Occupational performance is the ability to complete all aspects of an individual's life. Older adults improve more over longer time periods. The older adult's background, strengths, and needs should be considered in activities. After completing the activities, older adults can manage their health better. Older adults can also

	maintain their current health level. Older adults have more control over their health. Occupational therapists can help older adults achieve those goals.
Your Professional Summary	This systematic review examined articles that addressed the effectiveness of interventions for older adults in community settings to improve occupational performance, quality of life, and decrease health-care utilization. The final review included 38 articles and 36 studies. All of the studies required that the minimum average age for older adults was ≥65 and that the older adults were living in a community setting. They defined a community setting as living in the community, a retirement home, an assisted-living facility, or a hospital setting if they were being discharged to a community-based dwelling. The articles included were published between 2008 and 2015. There were over 13,250 articles analyzed. A strength of the study was that there was a comprehensive search for the evidence. Another strength was that the biases were analyzed thoroughly and included in the article. A weakness of the study is that the outcomes across the studies varied widely so it is difficult to make comparisons. Another weakness is there is high performance bias because blinding of the participants rarely occurred. Overall, the systematic review showed that group and individual interventions can improve occupational performance and quality of life in older adults in community-dwelling settings. The Stanford Chronic Disease Self-Management Program (CDSMP), Modified Chronic Disease Self-Management Program, and other group programs are effective in improving quality of life. When providing group and individual interventions, it is important to consider the individuality of each participant to tailor the session accordingly. Future research should examine if group interventions are more effective when participants have the same condition or different positions.
	Critical Appraisal
Stated Purpose or Research Question	"A previous review of the literature looked at articles published from 1990 to 2008 on occupation- and activity-based health management and maintenance interventions. That review found moderate to strong evidence that client-centered occupational therapy improves occupational performance related to health management for community-dwelling older adults. The current systematic review is an update and expansion of the previous review and addresses the question, what is the evidence for the effect of health promotion, management, and maintenance interventions within the scope of occupational therapy on the occupational performance, QOL, and health care utilization of community-dwelling older adults?" (p. 2)
Background Literature	*Key points of the intro section:* "Multiple chronic conditions in older adults are associated with decreased health-related quality of life and decrease occupational performance" (p. 1). "Some people with chronic conditions have difficulty following through with self-management health promotion recommendations" (p. 1). Occupational therapy "practitioners can assist clients in establishing, restoring, and maintaining self-management techniques with a focus on health-promoting routines and habits" (pp. 1-2). *Theoretical perspective:* Not reported

Research Design	*Research design:* Systematic review *Rationale for the design:* It is an update and expansion of the previous review *For reviews of research, AOTA Level of Evidence:* Level I
Method	*Primary methods to answer research question:* Systematic review Identification: Identify records through a database search (12,243) Identify additional records through other references from other review questions (1,000) Identify additional records through other sources (7) Screening: Eliminate records based on duplicates and titles (11,794) Review the title and abstracts of remaining articles (1,456) Eliminate records based on title and abstracts (1,302) Eligibility: Complete a full-text review (154) Eliminate records based on the full-text review (116) Included: Review the remaining articles to include in the qualitative synthesis (38) *Variables*: Peer-reviewed scientific literature published in English *Keywords*: Population AND Rehab Info AND Intervention: Health Management AND Study and Trial Designs "aged (80 and over), aged (includes ages 80 and over and frail elderly), aging, elderly, geriatrics, gerontology, late life, older adults, oldest old, pensioner, seniors, 65+, young old, occupational therapy, physical therapy, rehabilitation, activity patterns, anorexia, behavior change, bulimia, care management, case management, chronic disease management, client education, diabetic diet, diet, diet therapy, disease management, exercise, exercise adherence, faith based groups, habits, health behavior, health behavior (includes patient compliance, self-examination, and treatment refusal), health education, health knowledge, health literacy, health maintenance, health management, health promotion, health services accessibility, health services for the aged, healthy attitudes, lifestyle, medication compliance, medication errors, medication management, menu planning, nutrition, nutrition education, obesity, patient education, physical activity, physical fitness, prevention, primary prevention, psychosocial rehabilitation, relapse, rigidity (habit rigidity), routines, secondary prevention, self-management, smoking cessation, sports, strength training, substance dependence, substance-related disorders, therapeutic exercise, tobacco use cessation, weight control, weight loss, wellness, wellness programs, yoga, appraisal, best practices, case control, case report, case series, clinical guidelines, clinical trial, cohort, comparative study, consensus development conferences, controlled clinical trial, critique, cross over, cross-sectional, double blind, epidemiology, evaluation study, evidence-based, evidence synthesis, feasibility study, follow-up, health technology

	assessment, intervention, longitudinal, main outcome measure, meta-analysis, multicenter study, observational study, outcome and process assessment, pilot, practice guidelines, prospective, random allocation, randomized controlled trials, retrospective, sampling, scientific integrity review, single subject design, standard of care, systematic literature review, systematic review, treatment outcome, validation study" (Supplemental Table 2). *Databases*: Medline, PsycINFO, CINAHL, OTseeker, and Cochrane Database of Systematic Review *Procedures*: Literature Search → Screening & Selection → Levels of Evidence → Data Abstraction and Risk of Bias
Filters	*Research Designs included and not included:* Level I, II, & III studies included Level IV & V studies were not included *Inclusion criteria:* Intervention approaches "within the scope of occupational therapy practice and were provided to older adult participants with an average ≥65" (p. 2). "All participants were older adults living in the community, including a retirement home or assisted living facility, or in a hospital setting if they were being discharged to a community-based dwelling" (p. 2). Included studies had "participants who were older adults with diabetes, arthritis, cardiac disease, or other chronic conditions, including mild cognitive impairment and mild Alzheimer's disease" (p. 2). "Studies that measured QOL, health care utilization, or any area of occupational performance were included" (p. 2). Literature published between October 2008 and December 2015. *Exclusion criteria:* Did not include studies that looked at interventions that were not incorporated into routines. For example, interventions involving only teaching exercise. "Excluded data from presentations, conference proceedings, non-peer-reviewed research literature, dissertations and theses" (p. 2). "If the average age of the participants was <65 or if the participants were living in a hospital setting but not being discharged to the community" (p. 2). "If participants had acute or chronic conditions covered in an AOTA Practice Guideline, such as stroke, moderate or severe Alzheimer's disease, or low vision" (p. 2). *Total references found*: 12,243 citations and abstracts were initially found. *Process for eliminating references:*

	The methodology consultant to the EBP Project completed the first elimination on the basis of duplicates and titles. This resulted in 449 citations plus 1,000 additional citations and 7 abstracts remaining. The review team screened 1,456 citations and abstracts eliminating those that didn't fall into the inclusion criteria. There was a full-text review on the 154 remaining articles. Articles were eliminated based on the inclusion and exclusion criteria.
Results	*Description of the articles:* 38 articles and 36 studies were included in the review. Of the 36 studies: "19 were Level I RCTs, 6 were Level II studies, and 11 were Level III studies" (p. 3). "8 occurred in the United States, 5 occurred in Canada, 10 occurred in Europe, 6 occurred in Asia, and 7 occurred in Australia" (p. 3). "4 of the studies explored the effectiveness of interventions for well older adults, 12 for older adults with any chronic disease, and the others focused on older adults with specific diseases including diabetes, cardiac conditions, pulmonary conditions, and arthritis and pain" (p. 3). "13 studies included an occupational therapist either as the primary interventionist or as part of a multidisciplinary team" (p. 3). "All studies "explored the effectiveness of health promotion interventions within the scope of occupational therapy practice, all measured occupational performance, QOL, or health care utilization" (p. 3). "All studies...implemented multicomponent health promotion interventions" (p. 3). *Analysis/theme one:* Standard and modified Stanford Chronic Disease Self-Management Programs interventions for Occupational Performance, Quality of Life, and Health Care Utilization outcomes "Sixteen articles reporting on 14 studies explored the impact of the manualized Stanford Chronic Disease Self Management Program (CDSMP) or a modified version of this program (mCDSMP) on occupational performance, QOL, or health care utilization of older adults" (p. 4). "The evidence-based Stanford CDSMP appears often in the literature in studies using the program in a variety of ways, including with groups of individuals with specific chronic conditions, professional leaders instead of or with peer leaders, and adaptations to the length of the program. It appears that CDSMP, no matter how it is modified, is effective in improving occupational performance for older adults living in the community" (p. 6). *Analysis/theme two:* Group interventions other than the Stanford Chronic Disease Self-Management for Occupational Performance, Quality of Life, and Health Care Utilization outcomes "Five studies looked at health promotion group interventions for older adults that were not directly related to the CDSMP model" (p. 5).

	"These studies evaluated the effectiveness of a manualized pain self-management group (Nicholas et al., 2013, Level I), an occupation-based self-management group (O'Toole, Connolly, & Smith, 2013, Level III), a group based on the Model of Human Occupation (Yamada, Kawamata, Kobayashi, Kielhofner, & Taylor, 2010, Level I), a joint protection group (Dziedzic et al., 2015, Level I), and a self-management group for people with osteoarthritis of the knee (Coleman et al., 2012, Level I)" (p. 5). *Analysis/theme three:* Individual interventions for Occupational Performance, Quality of Life, and Health Care Utilization outcomes "Twelve studies examined health promotion interventions delivered in an individual format" (p. 5). "Although the interventions varied greatly in number of visits and length of time, interventionist (occupational therapist, other health professional), format (face to face, telephone, both face to face and telephone), location of study (Europe, Asia, Australia, North America), and condition (e.g., cardiopulmonary disorder, diabetes, chronic illness), the interventions had some noteworthy similarities" (p. 5). *Analysis/theme four:* Combined group and individual interventions for Occupational Performance, Quality of Life, and Health Care Utilization outcomes "Five studies involved interventions that combined both group and individual sessions" (p. 6). "The group component in these studies ranged in total number of hours from one 2-hr workshop to twice-weekly sessions over 10 wk. The individual aspect was widely different across studies as well, including two individual telephone calls, one 30- min appointment to set goals, one home visit, a weekly session for up to 6 wk, and up to 10 1-hr sessions depending on individual need" (p. 6).
Authors' Discussion and Conclusion	*Idea one: "*The CDSMP... is effective in improving occupational performance for older adults living in the community" (p. 6). *Consistent findings* "Strong demonstrates the effectiveness of using CDSMP or mCDSMP to improve occupational performance. Two Level I studies, one Level II, and 4 Level III studies demonstrated statistically significant results supporting the use of CDSMP or mCDSMP with older adults to improve occupational performance" (p. 4). *Inconsistent findings* "Only 1 study that looked at improvement in occupational performance as one of the outcomes did not find statistically significant improvement" (p. 5). This Level I study did not demonstrate positive effects for occupational performance because it focused on well adults. It suggested that there may be less room for change in healthy older adults. *Idea two:* "All formats of health promotion interventions were effective in improving occupational performance, and group programs other than CDSMP or mCDSMP were also effective in improving QOL" (p. 6). *Consistent findings*

	"Strong evidence demonstrates the effectiveness of group health promotion in interventions other than CDSMP or mCDSMP to improve occupational performance. Two Level I studies and 1 Level III study demonstrated significant results supporting the effectiveness of these interventions in improving occupational performance for older adults" (p. 5). "Strong evidence was found for the effectiveness of one-to-one health promotion interventions over an extended period in improving occupational performance. Four studies found significant improvement in occupational performance" (p. 5). Three Level I RCTs supported the "effectiveness of group health promotion interventions other than the CDSMP or mCDSMP to increase QOL in older adults" (p. 5). These three studies included a skill mastery or practice component. *Inconsistent findings* Two Level 1 studies did not show improvement but they provided a brief intervention or no face to face visits. One Level III study did not find a significant improvement in group health promotions to improve QOL in older adults. *Idea three:* Occupational Therapy practitioners should consider providing individual health promotion interventions to older adults over an extended period of time. *Consistent findings* The Level I study that did not show improvement provided a briefer intervention (one home visit and one follow-up phone call) or no face-to-face visits. This suggests that extended periods of time working with older adults are more effective when providing individual health promotion interventions. *Inconsistent findings* N/A
Authors' Limitations	"Different mechanisms to support behavior change were used to develop interventions in the reviewed studies. Therefore, it is difficult to determine which specific components of the interventions led to the positive outcomes" (p. 7). "A variety of outcome measures were used, making meaningful comparisons across studies challenging" (p. 7). "The studies occurred throughout the world, demonstrating the broad effectiveness of health promotion programs; however, the feasibility of implementation may be affected by differences in health care systems among countries" (p. 7). "The data regarding racial diversity are limited" (p. 7). "Most of the studies had low reporting bias, but because almost half (17 of 36) were not RCTs, they had relatively high selection bias" (p. 7). "Blinding of participants rarely occurred, leading to high performance bias" (p. 7).
Authors' Implications For Practice and Future Research	*For future research*: Needs more research "to determine whether a group intervention is more effective when participants all have the same condition, so that content can be disease specific, or different diagnoses, to benefit from the variety of experiences" (p. 7). "Further explore the unique contribution of an occupational therapy practitioner in health promotion studies" (p. 7).

	More research is needed to "explore the effectiveness of telehealth health promotion interventions with older adults" (p. 7). Need to "understand the health care utilization implications of health promotion interventions" (p. 7). How can we best "tailor programs to meet health promotion needs of older adults by clarifying which intervention components are most effective?" (p. 7) *For OT Practice*: Practitioners need to understand the influence of aging and chronic illness on occupational performance, quality of life, and healthcare utilization Considerations needed: "Providing group or individual health promotion, management, and maintenance interventions to improve occupational performance;" (p. 7) "Providing group health promotion, management, and maintenance interventions to improve QOL;" (p. 7) "Including individualized goal setting, coping strategies, problem-solving techniques, and skill-specific practice in health promotion, management, and maintenance intervention with older adults" (p. 7).

Critical Appraisal: A systematic review of medication non-adherence in persons with dementia or cognitive impairment.

	Summary
APA Reference	Smith, D., Lovell, J., Weller, C., Kennedy, B., Winbolt, M., Young, C., & Ibrahim, J. (2017). A systematic review of medication non-adherence in persons with dementia or cognitive impairment. *PloS one*, *12*(2), e0170651. https://doi.org/10.1371/journal.pone.0170651
Abstract	"Background: Adherence to medication is vital for disease management while simultaneously reducing healthcare expenditure. Older persons with cognitive impairment (CI) are at risk for non-adherence as cognitive processes are needed to manage medications. This systematic review focuses on the relationship between medication non-adherence and specific cognitive domains in persons with CI, and explores determinants of medication non-adherence. When available, relationships and factors are compared with cognitively intact populations. Methods: A seven database systematic search of studies published between 1 January 1949–31 December 2015 examining medication non-adherence in community dwelling persons with CI or dementia was conducted. Articles reporting medication non-adherence in people with CI or dementia in the community, with or without caregiver supports were eligible for inclusion. Papers reporting adherence to treatments in cognitively intact populations, populations from hospital or institutional settings, for non-prescribed medication or those describing dementia as a factor predicting medication non-adherence were excluded. Data on study and population characteristics, research design, data sources and analysis, specific cognitive domains, non-adherence prevalence, measurement of adherence, salient findings, factors associated with adherence and strategies to improve medication adherence were extracted. Study limitations included inconsistencies between data sources and definitions, resulting in a loss of fidelity in the value and comprehensiveness of data, as well as exclusion of non-pharmacological treatments and regimens. Findings: Fifteen studies met inclusion criteria. Adherence among CI subjects ranged from 10.7%-38% with better rates of adherence in non-CI individuals. Medication non-adherence definitions varied considerably. New-learning, memory and executive functioning were associated with improved adherence and formed the focus of most studies. Multiple factors were identified as modulators of non-adherence. Conclusion: This review highlights a gap in knowledge on how specific cognitive domains contribute to medication non-adherence amongst CI populations, and demonstrates the current focus is limited to two domains: memory and executive functioning" (pp. 1-2).

Your Focused Question and Clinical Bottom Line	*Question:* What cognitive domain(s) and specific factors are associated with medication non-adherence in older adults with dementia and/or cognitive impairment(s)? *Clinical Bottom Line:* Memory was the only cognitive domain found to significantly impact medication adherence in individuals with cognitive impairment(s) or dementia. Other major risk factors associated with medication adherence included caregiver/spouse support, regimen complexity, and number of prescribed medications.
Your Lay Summary	This study looked at what parts of cognition affect taking medicine in older adults with memory or cognitive problems. It also wanted to look at other factors that can make taking medicine difficult for the same group if they have other conditions too. Fifteen articles were reviewed and all of them examined not taking medicine in people with memory or cognitive problems, who lived in the community with or without a caregiver. After reviewing all the articles, they found that memory played a large role in someone taking their medicine or not. They also found that having a difficult medicine routine, many medicines, and not having a caregiver could reduce someone taking their medicine correctly. Overall, older adults with memory or cognitive problems have a harder time taking medicine than older adults without them. Therapists should create unique ways to help these people take their medicine to reduce harm to their patient's health.
Your Professional Summary	This systematic review aimed to explain the relationship between specific cognitive domains and medication non-adherence in people with dementia or cognitive impairment. It also sought to determine factors related to medication non-adherence in the same population for treatment of comorbid conditions. This review included 15 studies, all of which reported medication non-adherence in people with dementia or cognitive impairment, who lived in a community setting with or without a caregiver for support. The studies that were included ranged from 1949 to 2015. While this allows for a more comprehensive review of the available research, health care practices and diagnostic criteria for dementia and cognitive impairment have changed over the years. This can be considered a weakness to the review as it does not consider the most recent and relevant information. One other weakness of this review is the inconsistency between the studies examined. Sample sizes ranged from 8 to 56,561 participants, study designs varied, definitions of medication adherence differed, and there were great discrepancies in attention to specific cognitive domains. While there are several weaknesses, this is among one of the first systematic reviews to examine the relationship between specific cognitive domains and medication non-adherence in this population. It also was not limited to only quantitative research. Overall, this review noted that memory is a large predictor of medication adherence, and factors such as caregiver support, regimen complexity, and the number of prescribed medications can also greatly impact medication adherence in older adults with dementia or cognitive impairment. The best interventions for practice regarding medication adherence are yet to be discovered, but they should be tailored to the

	individual. This review also alluded to the need for more research on these topics, as there is a lack of research and many discrepancies and inconsistencies in findings. Occupational therapy practitioners should be conscious of these findings and push for more research in this area, as medication adherence is in their domain.
	Critical Appraisal
Stated Purpose or Research Question	"The aim of this systematic review is to elucidate the relationship between medication nonadherence and specific cognitive domains in persons with dementia/CI. The secondary aim is to determine factors related to medication non-adherence in persons with dementia/CI who take medication for treatment of comorbid chronic disease(s)" (p. 3).
Background Literature	*Key points of the intro section:* "Self-management provides the patient with more control and responsibility to achieve effective disease management while simultaneously reducing healthcare expenditure [3]" (p. 2). "Older people are at risk of non-adherence due to a normal decline in dexterity, mobility, hearing and vision; however, impaired cognitive function may exacerbate these effects [7, 8]" (p. 2). "Of note, there is a paucity of research literature investigating the impact of dementia on the ability of patient's adhering to complex medication regimens [9]" (p. 2). "The functions of multiple cognitive domains are required to adhere to medication regimens [14, 15] as this task involves obtaining and accessing medications, understanding directions, scheduling intake, adjusting schedules, planning continuous access to medication and problem-solving missed doses [16, 17]" (p. 2). "A comprehensive understanding of the influence of all cognitive domains on non-adherence is necessary for clinicians to improve care" (p. 2). *Theoretical perspective:* Not reported
Research Design	*Research design:* Systematic review *Rationale for the design:* Not reported *AOTA Level of Evidence:* Level I, Systematic Review
Method	*Primary methods to answer research question:* Systematic review Perform secondary data analysis and collate relevant data. Identify records through database search. Collate results in reference database. Remove duplicate articles. Screen titles and abstracts of relevant articles. Apply eligibility, inclusion, and exclusion criteria. Search reference lists for potentially relevant research. Review findings and examine the relationship between medication nonadherence and specific cognitive domains in persons with dementia or cognitive impairment, and determine if there are factors related to medication non-adherence in this population. Review the remaining article for qualitative synthesis. *Variables:*

	Research in peer-reviewed journals. Available in English language and full text. Research available between January 1st 1949 to December 31st 2015. "Articles reporting medication non-adherence in people with CI or dementia in the community, with or without caregiver support" (p. 3). *Keywords:* The researchers in this study searched four keywords including adherence, medication, dementia, and medication adherence. They also searched several synonyms relating to those keywords which were used in different combinations: Adherence, persistence, compliance, nonadherence, non-adherence, patient compliance, patient nonadherence, patient non-adherence, concordance, and non-concordance. Medication, prescription drug, drug therapy, treatment, prescription, medicines, treatment regimen, treatment schedule, medication safety, and pharmaceutical. Dementia, Alzheimer's Disease, cognitive impairment, memory disorders, mild cognitive impairment, and impaired cognition. Medication adherence, medication error, treatment compliance, medication compliance, medication management, drug discontinuation, adherence treatment, adherence schedule, and (non-adher* adj2 (drug* or medicat* or prescription* or pharmaceutical*)). *Databases:* "The following seven databases were selected: Ovid MEDLINE, EMBASE, CINAHL (via EBSCOHOST), COCHRANE DATABASE OF SYSTEMATIC REVIEWS, PsycINFO (via EBSCOHOST), Web of Science, and Scopus" (p. 4). *Procedures:* Systematic review Definitions Clearly define dementia and cognitive impairment according to the Diagnostic Statistical Manual version 5 (DSM-V) to outline specific cognitive domains. Study Selection Identify eligibility, inclusion, and exclusion criteria. Reporting Guidelines Ensure accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Data Sources and Searches Select databases and conduct searches for relevant research. Collate results in reference database. Remove duplicate articles. Screen titles and abstracts of relevant articles. Apply inclusion and exclusion criteria. Search reference lists for potentially relevant research.

	Data Extraction and Quality Assessment Extract data from articles including: "Study and population characteristics, research design, data sources and analysis, specific cognitive domains, prevalence of non-adherence, method of measuring adherence, salient findings, factors associated with adherence, strategies for improving adherence and study limitations" (p. 4). "Information on demographics, prevalence of adherence, methods for promoting adherence and potential risk factors for non-adherence were collated" (p. 4). Assess internal validity of articles using National Institutes of Health's (NIH) study quality assessment tool comprising 14 criteria. Have researchers assign a quality rating to each study.
Filters	*Research Designs included and not included:* Retrospective cohort studies (n=3), prospective cohort studies (n=7), cross-sectional studies (n=3), and case control studies (n=2) were included. *Inclusion Criteria:* "Inclusion criteria comprised original research in peer-reviewed journals available in English language between 1 January 1949–31 December 2015. Studies with participants who had dementia as described by authors and comorbid chronic diseases were included. Articles reporting dementia of different severities were also included. Article definitions and methods of diagnosing dementia were not restricted to the DSM-V clinical diagnostic criteria used to structure this review" (p. 3). *Exclusion Criteria:* "Excluded were studies on medication non-adherence in hospital or institutional setting (e.g. nursing home). Papers reporting adherence to treatments other than prescribed medication and those that described dementia as a factor predicting medication non-adherence were excluded. We also excluded study populations consisting of cognitively intact persons only" (p. 3). *Total references found:* "The combined searches yielded 15,033 records" (p. 4). *Process for eliminating references:* PRISMA flow diagram identification, screening, eligibility, and included articles: Records identified through database search (n=15,033). Duplicates removed (n=5,821). Remaining records screened (n=9,212). Records excluded from title and abstract screening (n=5,892). Full-text articles assessed against eligibility criteria (n=3,320). Full-text articles excluded for not meeting eligibility criteria: Adherence to medication not included (n=3,210). Animal population (n=40).

	Cognitively intact population (n=28). Institutionalized population (n=5). Child population (n=1). Studies included for qualitative synthesis (n=15).
Results	*Description of the articles:* Of the 15,033 records, 15 articles were eligible for inclusion. Research designs included retrospective cohort studies (n=3), prospective cohort studies (n=7), cross-sectional studies (n=3), and case control studies (n=2). "Data collection methods included interviews (n = 12), databases (n = 2), surveys (n = 1), through interactive video technology (n = 1) and electronic recording devices (n = 1)" (p. 4). "The quality of studies was rated as good (n = 7), fair (n = 7) and poor (n = 1)" (p. 4). "Adherence in persons with dementia living in the community was the focus in eleven studies, and of these, three examined the role of caregivers of CI older adults" (p. 4). "The remaining studies (n = 4) described adherence in the general population with a subgroup of cognitively impaired persons" (p. 4, 6). "Studies were too varied in purpose, design and sample to be analysed in an aggregate form" (p. 6). "Sample sizes ranged from 8 to 56,561 participants" (p. 6). "Participant demographics were relatively homogenous; age in years of late 70s to early 80s, predominately female, Caucasian, completed 11–12 years of education, had a diagnosis of dementia or mild cognitive impairment (MCI) and lived with a spouse or family member" (p. 6). "There was a wide range in the level of cognitive impairment in participants between the studies, with 9.6 to 100% of participants with severe CI and 29 to 72.2% with MCI" (p. 6). *Analysis/theme one:* Medication non-adherence and adherence "The definition of medication non-adherence and adherence varied widely with studies describing under and overtaking (n = 2), omission of a single dose (n = 7), deviation from a prescribed time (n = 2) and deviation from dose intervals (n = 3)" (p. 7). *Analysis/theme two:* Overview of the relationship of non-adherence with specific cognitive domains/deficit "Five articles investigated deficits in cognitive domains: attention (n = 3), speed of information processing (n = 1), visuospatial and constructional skills (n = 3), praxis (n = 1), new learning and memory (n = 5), executive functioning (n = 5), abstract reasoning as well as receptive and expressive language" (p. 10). Most cognitive domains were not statistically significant predictors of medication adherence and management. Many studies focused on the cognitive domains of new learning, memory, and executive function, but results were mixed. "One study found participants often knew medications by colour and shape rather than name or indication" (p. 10).

	"One prospective cohort study reported better performance on the Dementia Rating Scale conceptualization subscale increased the likelihood of non-adherence" (p. 11). *Analysis/theme three:* Factors associated with non-adherence Individual factors associated with non-adherence included ethnicity, forgetting, cognitive deficits, cognitive impairments, dementia, depression, inadequate self-care confidence, lower level of education, concern about taking prescription drugs, and intentional noncompliance. While the presence of a caregiver can improve adherence, there are some hazardous factors that could still impact adherence such as caregiver distress, not living with caregiver, absence of environmental assistance, and spouses as primary caregivers who are also cognitively impaired. "Taking fewer drugs was associated with improved adherence in one study using self reports and CI persons taking four or more daily medications had a 2.5 fold increase in non-adherence compared to those taking less than four medications according to independent rater-reviews" (p. 11). Another cross-sectional study found no significant association between medication adherence and the number of drugs. Memory assistive devices, participants setting up their own medication schedules, and environmental cues contributed to increased adherence. "There was a negative correlation between physician rating and patient's ratings of medication treatment adherence. Furthermore, poor client-physician relationships was an independent predictor of poor adherence (defined as <80%) whilst prescription insurance was positively associated with medication adherence on univariate analysis only" (pp. 10-11). *Analysis/theme four:* Interventions or strategies used to manage medications "Telecommunication technology and a medication reminder device were used to assess medication self-administration in participants with dementia" (p. 13). "Video monitoring intervention stabilized adherence even as global mental status declined over time, while adherence for the control group (no monitoring) declined as global mental status declined. End-of study adherence was statistically significant for the video monitored group (81%) compared to controls (62%)" (p. 13). "One study reported 89% (n = 231/257) participants with an assistive system to track medication were fully adherent. This proportion was similar to those not using assistive methods 87% (n = 74/86)" (p. 13). "The most common assistive system was specific placement of medications to trigger memory (34.2%, n = 92). These findings were discordant with another study, whereby CI participants' MMSE scores were not associated with reported use of memory focused assistive methods" (p. 13).
Authors' Discussion and Conclusion	*Idea one:* Cognitive domains Of all the cognitive domains examined, intact memory was able to significantly predict medication adherence in populations with cognitive impairments, while other cognitive domains received less attention, or had inconsistent or insignificant findings.

	Idea two: Risk factors The most common risk factors for medication non-adherence were cognitive impairments, absence of caregiver or spouse living with the patient, regimen complexity, and the number of prescribed medications. *Idea three:* Interventions Interventions were only examined by two studies, but there was a recurring theme of caregiver support for successful interventions; however, this finding does not support independence. Interventions and individual strategies need to be translated to populations with dementia or cognitive impairment. *Idea four:* Medical consequences Medication non-adherence can have consequences such as poor disease control, increased hospitalizations, disability, and early death; however, records in this review rarely examined these issues or were not in populations with dementia or cognitive impairment. *Consistent findings:* Many specific cognitive domains were not significant predictors of medication adherence in populations with dementia or cognitive impairment, or findings were inconsistent. *Inconsistent findings:* There were many inconsistencies in the data between the 15 records used in this review regarding cognitive domains, medication adherence or non-adherence, the relationship between adherence and specific cognitive domains, factors associated with non-adherence, and interventions or strategies for medication adherence.
Authors' Limitations	"Limitations were the inconsistencies between data sources and definitions, resulting in a loss of fidelity in the value and comprehensiveness of data gathered by each method" (p. 15). "Finally, non-pharmacological treatments and regimens were excluded" (p. 15). "Articles that were written or translated into English were only able to be included in this review" (p. 15). "Generalizing the findings should be done with caution. The eligible research studies spans over 20 years (1994–2012) and the nature and assessment of medication adherence/nonadherence have changed along with changes in diagnosis of dementia and CI as well as health care practice" (p. 16).
Authors' Implications For Practice and Future Research	*For future research:* "It is surprising that impairment in specific domains was not as useful in understanding and preventing medication non-adherence in this population. Further research is needed to understand this complex relationship and elucidate if different

	patterns of suboptimal adherence may exist depending on the combinations of neurocognitive impairment" (p. 14). "Future studies should consider the use of other methods to identify adherence/non-adherence in an older population, including personalized medical records and direct pharmacist questioning, which have been suggested as optimal measurement tools in previous studies" (p. 14). "The difficulty for clinical practise is to rationally prescribe medications for older adults with multiple chronic conditions and reduced life expectancy whilst also analysing: the likelihood of benefit and goals of care and satisfying the basic principles of optimal medication use. Therefore, future research should focus on a subpopulation of persons with dementia or CI with co-morbid diseases" (pp. 14-15). "Given the paucity of data available, future research could explore a realist review approach to combine theoretical understanding and empirical evidence. A realist review focuses on explaining contextual relationships between how interventions are applied and produce outcomes. This may enable a deeper understanding of potential effectiveness of interventions while waiting for empirical clinical study evidence" (p. 15). "This study identified several methodological gaps and highlights the lack of focus on specific cognitive domains that may potentially contribute to medication non-adherence. There is also a paucity of information about adherence and dementia subtypes" (p. 16). *Implications for Practice:* "Such findings have implications for clinical practice. For example, interventions to improve adherence could potentially benefit from providing written instructions and resources, not just verbal and the use of assistive technologies" (p. 14). "Furthermore, it has implications for the use of brief screening tools to more efficiently identify at-risk patients for closer monitoring and the development of assessment tools to inform targeted adherence interventions" (p. 14). "Clinical practice must take into account the accumulating research for the prevention of medication non-adherence and the management strategies available for this population. Medication reminder devices are suggested to combat this issue, however, the degree of efficacy of these devices and the appropriate support for using such a device amongst this population are yet to be determined" (p. 15).