The Self-Medication Assessment Tool (SMAT)

Training Program

RÉSEAU DE SANTÉ Horizon HEALTH NETWORK

Mount Allison UNIVERSITY

What is the Self-Medication Assessment Tool?

The Self-Medication Assessment Tool (SMAT) is a comprehensive instrument intended to screen for medication self-management deficits in older adults and to facilitate targeted interventions.

The Self-Medication Assessment Tool (SMAT) Training Program

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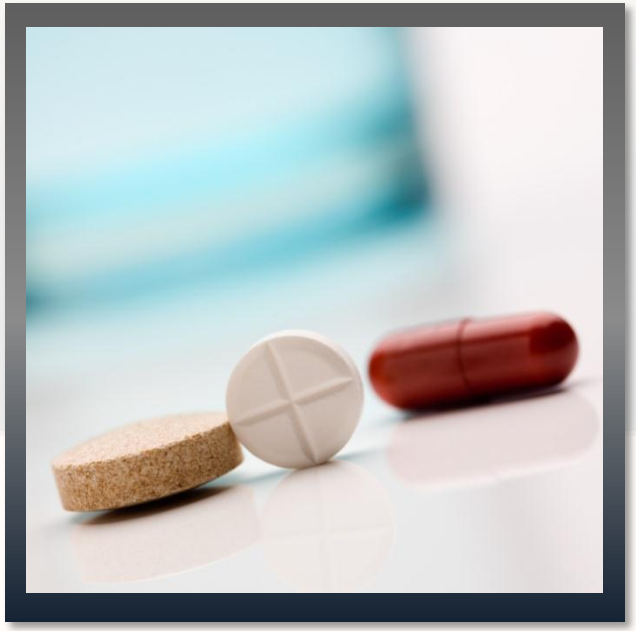

Module I: Introduction and Background

Part A: Factors Affecting Medication Adherence

Background

A person's capacity for medication management is defined as the "cognitive and functional ability to self-administer a medication regimen as it has been prescribed."

The majority of community dwelling older adults are engaged in the self-care activity of managing a medication regimen.

Background

It has been estimated that 35 - 60% of people do not take their medications as prescribed.

Drug related problems are reported to be a major or contributing cause of:

- about 19-28% of hospitalisations in people over age fifty,
- increased emergency room visits,
- and increased need for assisted living arrangements.

Factors Influencing Adherence

Many factors affect long-term adherence to medication therapies, including:

- Patient Factors
- Medical & Treatment Factors
- System Barriers

Factors Affecting Adherence: Patient Factors

Several patient factors have been identified to influence medication adherence, namely:

- Age
- Physical & Sensory Factors
- Memory & Cognition
- Attitudes, beliefs and preferences

Patient Factors: Age

- Adherence across adult age groups
  - Ages 65 – 74 = fewest errors
  - Ages 75+ = most errors
- Why do the “young” older adults perform better?
  - Less busy and/or routine activities allows planning/ use of memory aids
  - Health-care is a priority

Patient Factors: Age

Increasing Age

- Physical functional capacity impacted
  - E.g., Arthritic conditions can make it difficult to remove medication from packaging
- Impaired drug metabolism and unique sensitivity to drug effects
  - Can impact cognition, mobility, memory

Patient Factors: Age

Increasing age

- Sensory acuity changes
  - Vision
    - Need 12 pt or larger font and high contrast text on labelling
  - Hearing
    - High frequency loss affects language comprehension
    - Function best with low noise environment and low vocal tone

Patient Factors: Memory & Cognition

The complex cognitive task of medication adherence includes:

- Understanding the instructions
- Making a plan of action (integrating with daily activities)
- Remembering what to do
- Remembering to do it
- Remembering if you did it already (reality monitoring)
- Deciding what to do if missed a dose
- Assessing performance
- Deciding if memory aids are needed

Patient Factors: Memory & Cognition

- There are many aspects of memory performance related to medication adherence. Some decline in normal aging, but others do not.

- Decreased cognitive ability may not lead to adherence problems, as many seniors compensate for normal cognitive declines very successfully.

Patient Factors: Memory & Cognition

Cognitive abilities that are maintained or improved in older adults not suffering from dementia:

- Automatic processing
  - Highly practiced tasks show few declines.
- Increased vocabulary
  - The size of our vocabulary continues to increase throughout adulthood.

Patient Factors: Memory & Cognition

- Prospective memory (Remembering to do something in the future)
  - Seniors, particularly 60 – 75 year olds, are often superior at remembering to carry out an action in the future because they use reminders effectively.

Patient Factors: Memory & Cognition

- Both External and Internal cues can be helpful with prospective memory:
  - External Cues: Physical reminders (alarms, visual cues)
    - can be very effective, but are used less often.
  - Internal Cues: Mental plans
    - Time-based cues ("*I will take my pill at 10 pm*")
    - Event-based cues ("*I will take my pill before bed*")
      - Event-based cues are generally more effective, but sometimes not when the routine is disrupted.

Patient Factors: Memory & Cognition

Age-related losses in older adults not suffering from dementia:

- Reduced speed of processing
  - Information needs to be presented in an organized and un-hurried fashion.

Patient Factors: Memory & Cognition

- Reduced working memory
  - Working memory allows us to juggle multiple pieces of information, and focus on a problem without being distracted.
  - Older adults can be challenged when needing to:
    - combine instructions for different medications into a plan of action
    - integrate plan of action into daily activities

Patient Factors: Memory & Cognition

- Reduced source memory:
  - Older adults are more likely to forget where they learned something, even if they remember the information.
  - Some older adults will therefore make decisions about how to take their medications based on information that comes from unreliable sources (e.g., magazines, television).

Patient Factors: Memory & Cognition

- Reality Monitoring: remembering that an action has been carried out.
    - difficult to recall accurately whether a medication has been taken earlier that day, particularly if a well-established routine exists.
    - difficult to determine if we actually carried out an action, or simply thought about it.
- Blister packs and dosettes are particularly helpful to avoid doubling doses due to age-related decline in reality monitoring.

Patient Factors: Memory & Cognition

- Research suggests that people adopt external memory aids because of their beliefs concerning memory, not because they believe their illness is serious.
    - Education should focus on the idea that everyone needs memory aids, as well as on the importance of adherence.

Patient Factors: Attitudes, Beliefs and Preferences

- General attitude toward taking medications
  - Negative: “drugs don’t work for me”
  - Overly positive: “there must be a drug that can solve my problem”
- Patient’s wants and expectations
  - “cure my pain”
  - “not to have to take so many pills every day”

Patient Factors: Attitudes, Beliefs and Preferences

- Patient beliefs and knowledge
  - Unsure if medication is of benefit
  - Concern about risks
  - Side effects experienced (patient or family/friends)
  - Confusion over how or why to take a medication
  - Fear related to previous problems or those of a family member

Medical and Treatment Factors: Diagnosis

- Symptom severity
  - Higher rates of adherence (>65%) with:
    - Hypertension, hypothyroidism, diabetes
  - Lower rates (50% or less) with “silent” diseases:
    - osteoporosis and hypercholesterolemia
- Increased co-morbidity burden
  - Increased adherence rates among those with multiple diagnoses
    - E.g., Hypertension + hypercholesterolemia + gout

Medical and Treatment Factors: Diagnosis

- Increased adherence with add-on drug therapy
  - Due to previous experience taking medications for a condition

Medical and Treatment Factors: Diagnosis

- Depression
  - People who are depressed are likely to:
    - amplify the side-effects of medications,
    - misinterpret symptoms of depression as side effects
  - Depression related to some medical conditions can go undetected and result in decreased adherence
    - E.g., Depression post-stroke
  - Antidepressants – prescribed by psychiatrist
    - Improved compliance with refills

Medical and Treatment Factors: Regimen Complexity

- A complex medication regimen for a patient includes:
  - high medication count,
  - frequent daily dosing,
  - multiple dosage forms,
  - additional usage directions

- Complex medication regimens have been linked to a greater risk of medication non-adherence in some patient populations

Medical and Treatment Factors: Patient-Provider Relationship

- Patient-provider relationship
  - Often, patients are provided little information about their medications
    - Information for older adults is best provided in list format

Medical and Treatment Factors: Patient-Provider Relationship

- Pharmacists and physicians
  - overestimate how much information they provide
  - rarely ask about side-effects or other barriers to adherence
  - may not recognize patients' low level of understanding/recall
    - e.g., "take one capsule 3 times a day" – confusing
    - "take one capsule 8am, 3pm, and 10 pm" – better

System Barriers: Socio-economic Issues

- Education
  - Low literacy levels
- Ethnicity
  - Impacts beliefs about healthcare an medications
- Language
  - Translated materials/information may not convey intended message

System Barriers: Socio-economic issues

- Lack of social support
  - Those without social support are less likely to
    - Be motivated to take medication
    - Receive reminders from others
- Financial status
  - Impacts access to healthcare and medications
  - May not be able to pay the medication cost or the co-pay associated with a drug plan

System Barriers: Socio-economic

- Lack of or cost of transportation and impaired patient mobility
  - Difficult to attend appointments
  - or to drop off or pick up prescriptions at pharmacy

Measuring Adherence: Consumption

- Measures of medication consumption
  - Pill counts
    - Often inaccurate or not feasible due to:
      - Missing information from labels
      - Variability between dispense and start dates
      - Old and new supplies combined

Measuring Adherence: Consumption

- Patient self-report
  - DRUGS tool; MedTake test
  - Quick screening tools
- Electronic medication adherence devices
  - MEMS; MDLog; CompuMed
  - Expensive
  - Not readily available

Measuring Adherence: Possession

- Measures of medication possession
  - Refill records, community pharmacy
    - Inconsistent report designs
  - Electronic claims databases
    - Medication possession ratio (MPR) reliable
      - Days' supply of drug over 1st yr of use/# days in yr
      - If ratio < 1 = lapses in Rx refills
      - If ratio 1 or greater; "perfect compliance"

Measuring Adherence: Possession

- Electronic claims databases
  - Persistency
    - Amount of time that person remains on chronic drug therapy
- Physician office electronic prescribing records
  - PPR – prescription possession ratio
  - Similar to MPR

The SMAT was designed to address many of these barriers:

- The SMAT assessment tool provides a comprehensive approach to determining a patient's ability to self medicate;
- The scoring system included in the SMAT allows for an objective interpretation of the patient's results;
- The SMAT also allows the pharmacist to plan interventions with the patient, caregivers and healthcare team;
- And finally, the SMAT may help prevent medication mismanagement events that can result in hospitalization.

Module I: Introduction and Background

Part B: The Self-Medication Assessment Tool

Description

The SMAT includes five scales that measure the various abilities required for safe and effective medication self-management.

1. Functional Scale – 22 items; 2 or 3 point score per item
    - Measures sensory, perceptual & physical abilities
2. Cognitive Scale – 22 items; 3 point score per item
    - Measures the ability to make judgments, manipulate information and interpret instructions

Description

3. Recall Scale – 4 items per drug; 2 point score per item
    - Medication names, indications, dose regimen, description of own regimen
    - This scale determines if initial medication instructions were understood and remembered.

4. Purposeful non-adherence – 3 items; 4 point score per item
    - Experiences with side effects
    - Belief in value of medication to health
    - History of stopping a medication

Description

5. Self-reported adherence – 4 items per drug; 2 point score per item
    - Patient's assessment of compliance to own medication regimen

Evaluation of the SMAT

- Focus groups with pharmacists were held to ascertain opinions on:
  - Usefulness of the SMAT
  - Ease of use
  - Thoroughness
  - Willingness to use SMAT

Evaluation of the SMAT

The reliability and validity of the SMAT was then tested in a sample of patients admitted to The Moncton Hospital between 2006 and 2008.

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Evaluation of the SMAT

- Sample Characteristics
  - Mean age of 81.5 yrs (range from 65-99 years)
  - Education level
    - Majority had one or more years in high school
  - Cognition
    - MMSE scores ranged 12-30 (mean 26)
    - CLOCK test scores ranged 4 – 13 (mean 9.2)

Validity and Reliability of the SMAT

- SMAT scales have high internal consistency
  - The items within each scale address the same domain.
- The SMAT shows high inter-rater reliability
  - agreement between two pharmacists who independently scored the same patient
- SMAT scores show high reliability
  - Patient scores remain stable over time

Validity and Reliability of the SMAT

- A strong correlation can be expected between the patient's results on:
  - The Cognitive Scale and
    - Results on the Functional Scale
    - Results on the Recall Scale
  - The Recall Scale and
    - Results on the Self-reported Adherence Scale

Validity and Reliability of the SMAT

- A significant negative correlation was found between results on:
  - The Cognitive Scale and
    - results on the Purposeful Non-adherence Scale
- Based on the study sample results, there is an expected correlation between:
  - Increasing age and a
    - decrease in Functional score
    - decrease in Cognitive score

Convergent Validity

- The Clock Drawing Test (CDT) is a common screening measure used to identify dementia and other cognitive impairments.
  - CDT correlates with the functional, cognitive and recall scales of the SMAT

Convergent Validity

- The Mini-Mental State Examination (MMSE) is a common screening measure used to identify cognitive impairment & monitor cognitive change over time.
  - MMSE correlates with the cognitive, recall and self-reported adherence scales of the SMAT.

Convergent Validity

- The Cognitive Competency Test (CCT) is used to measure cognitive performance within the context of everyday tasks.
    - CCT correlate with the functional, cognitive and recall scales of the SMAT

Evaluation of the SMAT – Results

- Acceptability to patients
  - Post –test surveys yielded positive reviews by patients:
    - Directions clear and easy to follow
    - 45 to 50 minute testing time not distressing
    - Assessment perceived to be useful

Evaluation of the SMAT – Results

- Clinical Usability
  - Pharmacists were able to make recommendations regarding adherence aids and supervision required using the scores from the SMAT
- Predictive Validity
  - Further research is underway to determine how well scores on the SMAT predict long-term health outcomes.

Conclusions

- The SMAT affords pharmacists a multifaceted tool that can help determine a geriatric patient's medication management ability.
- The tool has strong patient acceptability.
- The scale is reliable across time and across pharmacists, and has been shown to have acceptable validity.
- Scales with a stronger cognitive aspect relate well to measures of cognitive function.
- SMAT scoring system provides objectivity for clinical recommendations.

The Self-Medication Assessment Tool (SMAT) Training Program

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This completes Module I of the SMAT Training Program.

Thank you!