

INTRODUCTION & AIMS

- Little is known about how older adults (OA) *naturally* manage their own medications.
- Typically, proxy measures of medication management, like performance-based and pharmaceutical measures, are used to assess these skills. However, these measures fail to examine how OAs’ *compensatory strategies* (e.g., using a pillbox and placing pillbox in view on kitchen counter) influence their efficiency in managing their medication regimens.¹
- Therefore, our first aim is to develop a measure of real-world medication routine efficiency.
- Using the medication routine efficiency measure, we also aim to examine *preliminary* relationships with 1) medication management performance-based measures, 2) the medication regimen complexity index (MRCI), a pharmaceutical measure, and 3) the prospective and retrospective memory questionnaire (PRMQ), a self-report measure of memory difficulties.
- We also plan to examine preliminary relationships between our medication routine efficiency measure and known cognitive correlates of medication management (i.e., processing speed, memory and executive functioning).³

HYPOTHESES

- We hypothesis that the medication routine efficiency scores will correspond to performance on the medication management abilities assessment (MMAA) and medication subtest of the revised observed tasks of daily living (OTDL-R), because both measures are performance-based measures of medication management skills, even if the MMAA and OTDL-R do not consider compensatory strategies.
- We predict that the efficiency score will not significantly predict MRCI because it does not consider compensatory strategies and environmental factors that can be used to support medication routines.
- We also expect that participants who self-report memory problems on the PMRQ (i.e., despite their cognitive results) will have more efficient medication routines and will report using more compensatory strategies. We expect this because greater concern/insight about possible memory issues could encourage the use of compensatory strategies.

METHODS

Participants & Procedure

•71 community dwelling older adults with varying diagnoses were observed and video recorded while they showed and discussed their medication routine in home. Average age was 74.31 (*SD* = 9.04), education was 15.77 (*SD* = 2.65) and 70.8% were female.

Table 1. Percentage of participants endorsing physical health disease

	Heart disease	Hypertension	High Cholesterol	Stroke	Diabetes	Thyroid
Percentage (Yes)	15.5%	32.4%	33.8%	7.0%	18.3%	28.2%

Table 2. Percentage of participants diagnosed with cognitive disorders

	Normal Cognition	Mild Cognitive Impairment	Dementia	Other Medical	Other Cognitive
Percentage (Yes)	56.3%	25.4%	1.4%	7.0 %	1.5%

Table 3. Measure descriptions and descriptive statistics

		<i>M</i> ± <i>SD</i>	Range
<i>Medication Routine Efficiency Measures</i>			
Additional Task Related Actions	Tasks that are not necessary for completing the medication routine	1.59 ± 1.83	0 – 8
Compensatory Strategies	Strategies to improve the possibility of taking medications correctly	3.68 ± 1.81	1 – 10
Medication Routine Efficiency	CS-ATRA; A combination of the ATRA and CS scores that examine the efficiency of their medication routine	2.08 ± 2.50	-7 – 8
<i>Pharmaceutical Measure</i>			
MRCI	Medication Regimen Complexity Index ^{2,3} : Standard complexity index for prescribed and over the counter medication routines	9.52 ± 11.12	0 – 41
<i>Performance-Based Measures</i>			
MMAA	Medication Management Abilities Assessment ⁴ : requires participants to manage a mock day with a novel medication routine.	29.56 ± 2.88	21 – 33
OTDL-R	Medication subtest of the Revised Observed Tasks of Daily Living ⁵ : tasks require participants to use prior knowledge to demonstrate managing medications.	10.13 ± 1.95	5 – 13
<i>Self-Report Measures</i>			
PRMQ	Asks participants to report on minor memory mistakes that could be made in daily life.	35.22 ± 13.25	0– 59
PRMQ PM	Prospective memory questions inquire about problems with remembering to complete future tasks	18.57 ± 7.30	0 – 38
PRMQ RM	Retrospective memory questions inquire about problems with recalling information from the past	16.34 ± 6.36	0 – 27
“Have someone help with organizing medications”	Participant respond using a Likert scale from 1 to 9 indicating their ability to preform a given task.	1.47 ± 1.42	1 – 9
<i>Cognitive Measures</i>			
Memory	RBANS ⁶ Long List Delay Recall: requires participants to recall a list of words read earlier.	5.32 ± 2.59	0 – 9
Processing Speed	Digit Cancellation: participants scan a set of numbers and cross out a specified target number.	100.23 ± 37.61	49 – 300
Executive Functioning	D-KEFS ⁷ Letter Fluency: participants quickly name words that begin with a given letter.	37.21 ± 13.08	6 – 76

RESULTS

- Spearman rank correlation analyses were used to examine the relationships between variables of interest.

Table 4. Medication routine efficiency measure correlations analyses results

	Medication Efficiency	ATRA	CS
<i>Medication Routine Efficiency Measures</i>			
Medication Routine Efficiency	-	-	-
Additional Task Related Actions	-.66*	-	-
Compensatory Strategies	.69*	.00	-
<i>MRCI (n = 71)</i>	.10	-.04	.12
<i>Performance-Based Measures</i>			
MMAA (<i>n</i> = 55)	-.19	.14	.22
OTDL-R (<i>n</i> = 64)	.02	.02	-.05
<i>Self-Report Measures</i>			
PRMQ Total (<i>n</i> = 59)	.14	.06	.24
PRMQ PM (<i>n</i> = 58)	.09	.13	.22
PRMQ RM (<i>n</i> = 58)	.19	-.01	.27*
“Have someone help with organizing medications”	-.03	.11	.07
<i>Cognitive Measures</i>			
Long Delay Memory (<i>n</i> = 68)	-.02	-.10	-.15
Processing Speed (<i>n</i> = 62)	.29*	-.08	.29*
Executive Functioning (<i>n</i> = 68)	-.16	-.05	-.27*

* < . 05

DISCUSSION

- Medication routine efficiency was significantly associated with additional task related actions and compensatory strategies. Specifically, as medication routine efficiency increases, more strategies are being used, but as medication routine efficiency decreases, more additional task related actions (which may not necessarily support the medication routine) are being used, demonstrating convergent validity.
- Additional task related activities and compensatory strategies were not correlated (*r* = .00), suggesting that increases in additional task related activities were not related to either increases or decreases in compensatory strategy use.
- The medication routine efficiency scores did not associate with the MRCI. This is likely due to the medication routine efficiency score taking into factors such as compensatory strategies that the other measures do not.
- Unexpectedly, we did not find a significant relationship between medication routine efficiency and performance based measures, the MMAA and OTDL-R. This may be due to the performance based measures having standardized and novel routines, which is different from the unstructured nature of every day medication management.
- Compensatory strategies were correlated positively with the retrospective memory questions on the PRMQ. This suggests that participants who self-report having trouble remembering things in the past are incorporating more compensatory strategies into their medication routine to compensate.
- Digit Cancellation had a positive correlation with compensatory strategies, suggesting that individuals with a slower processing speed are more likely to use compensatory strategies. Individuals with slower processing speed also demonstrated greater medication efficiency.
- Letter fluency and compensatory strategies showed a negative relationship suggesting that those with higher executive functioning are using less compensatory strategies.

FUTURE DIRECTIONS

- We plan to continue developing the medication routine efficiency measure to consider other factors like environment and level of clutter in the home.
- Due to video recording errors, we were unable to observe all behaviors and relied on the participant and tester reports. We plan to improve data collection during the next round of testing.
- Participant efficiency in managing their medication routine will be examined in relation to real-world adherence by placing sensors on their medication containers to record use.

REFERENCES & FUNDING

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