StrongerMemory: Experiences of Older Adults in an Intervention Program for Cognitive Impairment

A Research Study Piloted by George Mason University in Partnership with Goodwin Living

StrongerMemory by Goodwin Living is a curriculum designed to stimulate the brain's prefrontal cortex, which governs the ability to retrieve memories. From 2021-22, 104 research participants completed a pre assessment protocol, 12 weeks of StrongerMemory, and a post assessment protocol. Research findings are listed below.

1

There was a statistically significant difference in mean scores for the Mini MoCA. See Table 1.

The Mini Montreal Cognitive Assessment 2.1 (Mini MoCA) was used to evaluate cognitive outcomes. Participants completed the 5-minute questionnaire during pre and post assessments. The mean total scores in Table 1 demonstrate a statistically significant difference between pre and post assessments.

2

StrongerMemory may be impactful for those with MCI. See Table 2.

Table 2 shows that StrongerMemory may have been more impactful for people with mild cognitive impairment (MCI) compared to people with no cognitive impairment.

3

The average scores on the Memory Functioning Questionnaire (MFQ) were similar between pre and post assessments. See Table 3.

The MFQ was a 4-page questionnaire that participants completed during the pre and post assessments. It provided scales for retrospective functioning, forgetting, forgetting during reading, remembering past events, seriousness (of forgetting) , and mneumonics. Findings indicate no difference in average scores between pre and post assessments.

4

There was a statistically significant increase in one of the questions from the Retrospective Functioning Scale. See Table 4.

In Table 4, we summarize some items that could provide evidence that shows the effectiveness of StrongerMemory. These items were pulled from the MFQ: retrospective functioning, forgetting, seriousness (of forgetting) , and mnemonics. There was a statistically significant increase in post assessment scores for the first item of the table from the retrospective functioning scale. The post assessment results of the remaining 3 questions in Table 4 show a slight increase in scores but are not statistically significant.

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5 Summary of Main Findings

When asked how their memory was compared to the way it was one year ago, ***participants on average reported their memory as being better after completing the StrongerMemory program.***

As measured by the Mini MoCA, ***participants completing the StrongerMemory program had better total cognitive scores and better scores on the recall portion of the assessment***, for example - "I read some words to you earlier, which I asked you to remember. Tell me as many of those words as you can remember."

As measured by the Mini-MoCA, ***the StrongerMemory program may have had a more significant impact on participants with MCI compared to participants with normal cognitive functioning***.

30 of the 104 research participants joined focus groups designed to understand their experiences with the StrongerMemory program. Themes resulting from the focus groups are explained below.

1 5 major themes emerged from the focus groups:

2 Motivating: The external and internal motivations of participants to join and keep up with StrongerMemory.

Examples of external motivation include approval from others, the community, incentives, understanding the research behind StrongerMemory, and the desire to contribute to research that could benefit others. Internal motivation included noticing and preventing memory decline, "why not," and concern about present and future memory decline.

3 Appreciating: The ways participants enjoyed and valued their experiences with StrongerMemory.

Participants deepened their outcomes and enjoyment through the writing prompts, sharing program outcomes with family, and discovering new interests. Participants found meaning and enjoyment outside of the program by receiving support from others and sharing the StrongerMemory program with a broader audience.

4 Challenging: Difficulties with program content and the ease of completing 12 weeks of StrongerMemory.

Participants shared cognitive, physical (e.g., difficulty writing), and motivational struggles that interfered with their ability to complete the program easily. Many participants found that even though the exercises were short, regular participation could be difficult because of time management or a need for more instructions.

5 Committing: Participants' own reasons to stick with the StrongerMemory program and continue after the research study.

Participants described ways they formed habits, established community, and chose to commit to the program. For example, some continued with the StrongerMemory program by incorporating the exercises into their breakfast routine.

6 Enhancing: The ways participants adapted the program to fit their needs.

Participants adapted exercises, built community, and offered research suggestions to amplify StrongerMemory. For example, math worksheets were laminated for easy reuse.

The GMU gerontology team invites people aged 60 and over who have cognitive or memory concerns to participate in the StrongerMemory program. Participants must reside in Northern Virginia and have no previous experience with the StrongerMemory program.

Participation in this study will involve completing questionnaires before and after the 12-week StrongerMemory program,and completing weekly check-in sheets. Upon completion of the post-interview, we will provide a gift card ($75) as compensation for your time and effort.

If you are interested in participating in StrongerMemory Phase II, please complete the online questionnaire https://redcap.gmu.edu/surveys/?s=C8J4JF9DCW or contact Dr. Kang (hkang31@gmu.edu).

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The study results provide evidence that non-pharmacological interventions, like the StrongerMemory program, can be used to increase brain health, potentially slowing down the progression of cognitive impairment.

Table 1. Paired Sample T-test of Mini-MoCA between Pre and Post (Score Range 0-15*)

	Pre-test (n=102)	Post-test (n=102)	t-value	p-value
Language fluency[1]	3.51	3.59	-1.182	0.120
Orientation[2]	5.84	5.81	0.726	0.235
Recall[3]	3.44	3.92	-3.837	0.000
Total Score	12.79	13.32	-3.444	0.000

*A score of 11 or above is considered normal.
[1]"Name a maximum number of words in one minute that begin with the letter T."
[2]"Tell me the [year, month, exact date, and day of the week]." " Tell me the name of this place, and which city it is in."
[3]"I read some words to you earlier, which I asked you to remember. Tell me as many of those words as you can remember."

Table 2. ANCOVA: Mean Difference of Mini-MoCA between Pre and Post by Living Status and MCI Status

	Living Status			Pre Mini-MoCA Score	
	Live alone in my own home	Live in a household with other people	Live in a residential facility	Having a score of 10 or less (MCI)	Having a score of 11 or more (normal)
N	36	47	17	20	82
Mean of Pre Mini-MoCA Scores	12.44	13.25	12.33	9.81	13.54
Mean of Post Mini-MoCA Scores	13.47	13.83	11.53	10.75	13.95
Adjusted Mean of Post Mini-MoCA Scores	13.73	13.46	11.98	12.35	13.56

Table 3. Paired Sample T-tests of MFQ (Average of each sub-section) between Pre and Post (Score 1-7)

	n	Pre-test (mean)	Post-test (mean)	t-value	p-value
General Rating Scale[1]	102	4.75	4.75	0.094	0.462
Retrospective Functioning Scale[2]	102	3.08	3.02	0.480	0.316
Frequency of Forgetting Scale*[3]	103	5.07	5.04	0.535	0.297
Frequency of Forgetting during Reading Scale[3]	95	5.45	5.47	-0.194	0.423
Frequency of Forgetting during Reading Scale (News or article)[3]	93	5.80	5.78	0.255	0.400
Remembering Past Event Scale[4]	102	4.76	4.87	-0.256	0.399
Seriousness Scale*[5]	103	4.80	4.76	0.360	0.360
Mnemonics Usage Scale[6]	103	2.56	2.61	-0.699	0.243

*Excluding two questions: taking a test and losing the thread of thought in public speaking
[1]major problems = 1, some minor problems = 4, no problems = 7
[2]much worse = 1, same = 4, much better = 7
[3]always = 1, sometimes = 4, never = 7
[4]very bad = 1, fair = 4, very good = 7
[5]very serious = 1, somewhat serious = 4, not serious = 7
[6]always = 1, sometimes = 4, never = 7

Table 4. Paired Sample T-tests of MFQ (Question that has Meaningful Difference between Pre and Post) between Pre and Post (Score 1-7)

	n	Pre-test (mean)	Post-test (mean)	t-value	p-value
How is your memory compared to the way it was a one-year ago[1]	102	3.72	4.03	-3.154	0.001
As you are reading a novel, how often do you have trouble remembering what you have read - the sentence before the one you are currently reading[2]	95	6.22	6.37	-.995	0.161
When you actually forget in these situations and how serious of a problem do you consider the memory failure to be? appointments [3]	89	3.97	4.21	-.970	0.167
How often do you use these techniques to remind yourself about things? associations with other things[4]	102	4.03	4.28	-1.343	0.091

[1]Retrospective Functioning Scale – First item
[2]Frequency of Forgetting during Reading Scale- Fifth item
[3]Seriousness Scale – Third item
[4]Mnemonics Usage Scale – Seventh item

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