

RESEARCH ARTICLE

Usability of a memory aid handbook for older people with subjective cognitive impairment—An explorative pilot study

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Abstract

Background: Memory problems are common in advanced age. Memory strategies can be used to manage such challenges. To assist older people facing memory problems, we conducted a pilot study to evaluate the usability of a memory aid handbook that we developed specifically for this purpose.

Method: A memory aid handbook with a 7-week program was developed based on a systematic review. A total of 19 older people with self-reported memory problems (mean age: 76.11 years, female: 73.68%) tested the memory aid handbook and completed the System Usability Scale (SUS), a checklist on the relevance of the strategies in the handbook, and questionnaires on daily life functioning and self-efficacy. Further, they participated in cognitive tests. In a pre-post design, within-subject differences were determined using paired t-tests.

Results: The usability of the memory aid handbook scores as were high (mean SUS score: 99.21). The checklist indicated that the handbook was perceived as beneficial for confirming already established memory strategies and stimulating new ones, such as self-acceptance, visualizing and verbalizing daily routines, and asking for help. In addition, the checklist revealed that using a calendar was considered the most helpful strategies for daily living, followed closely by taking notes, having specific places for certain items and creating routines in daily life. After the 7 weeks, participants scored significantly better in the cognitive and self-efficacy tests. The exploratory nature of the study combined with the small sample size should be considered when interpreting the results.

Conclusion: The usability of the handbook was high, reflecting the relevance of the strategies it contains. Teaching memory strategies can be a useful, inexpensive method to foster independence among those at risk for cognitive impairment.

KEYWORDS

cognitive aging, health services for the aged, healthy aging, memory strategies, usability

Abbreviations: DST, Digit Span Task; FAQ, Functional Activity Questionnaire; GSE, General Self-Efficacy Scale; IADL, Instrumental Activity of Daily living according to Lawton; MoCA, Montreal Cognitive Assessment; SCD, Subjective Cognitive Decline criteria; TMT, Trail-Making Test.

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Key points

- People with memory problems perceived a memory aid handbook as useful in confirming already established memory strategies and stimulating new ones or revising old ones.
- Using a calendar was considered the most helpful strategy for daily living, followed closely by taking notes, staying organized, having specific places for specific things, creating routines in daily life, and avoiding time pressure.
- New incentives provided by the memory aid handbook included self-acceptance, visualizing and verbalizing daily routines, and asking for help and encouraging older people with memory problems to rethink old such as putting frequently used items in a more prominent place.
- The memory aid handbook received the best imaginable usability score, and is characterized by great ease of use, rendering it suitable for independent use by elderly individuals with subjective cognitive impairment.

1 | INTRODUCTION

Given the increasing number of older people in the societies, it is of great interest to promote successful cognitive aging. Age-related cognitive impairments are associated with enormous societal and private health care costs^{1,2} because they usually lead to the inability to live independently.³ Memory problems in old age do not necessarily come with neuropathological abnormalities, as changes in brain structures do not always correlate with cognitive impairment.⁴ However, it is important to note that individuals experiencing memory problems may be at an increased risk for future cognitive decline and dementia.⁵ Therefore, it is of great importance to support older people with memory problems to maintain their cognitive functions for as long as possible.

Memory problems in old age often include difficulties remembering dates or new information, misplacing items, and getting distracted easily.^{6,7} A natural mechanism to counteract memory problems is the development of strategies.^{8,9} Typical strategies are the use of memory support systems (i.e., calendars, lists and notes, environmental cues), internal mechanisms like attentional regulation, and self-regulatory functions to control emotional and physiological responses to forgetfulness.^{10,11} Memory strategies foster independence and improve the quality of life as well as self-perceived well-being.^{12,13} Research shows that a more frequent use of memory strategies in daily living is associated with higher levels of functional independence.¹⁴ It has further been shown that memory strategies, as part of cognitive rehabilitation interventions, have a positive effect on cognitive performance, such as working memory, speed of processing and executive function,^{14–17} which some studies suggest persist for some time after the intervention.¹⁵ Functional magnetic resonance imaging studies support this observation by demonstrating changes in activation of different brain areas and enhanced brain connectivity.¹⁵ It seems advisable to support older adults with memory problems as early as possible. This will allow them to find the most appropriate memory strategies for their problems in daily life before their cognition deteriorates further. Indeed, studies have shown that older adults with memory problems have sufficient resources to apply memory

strategies,^{3,7} especially at the onset of memory problems when they are still capable to learn and implement new strategies.⁷

Studies have shown that older people prefer self-developed memory strategies to external strategies.^{14,18} Such a preference for self-developed strategies may be rooted in feelings of autonomy and self-efficacy. Therefore, providing older people with strategies developed by others in similar situations could be a valuable support. In light of this, a systematic review¹⁹ was conducted to identify self-reported memory strategies, which were then compiled into an evidence-based memory aid handbook, following a systematic literature search in PubMed, PsychInfo, Scopus, and Web of Science using a well-defined search string. Two researchers independently checked the studies for inclusion and exclusion criteria and evaluated their quality using CASP-checklists. Considering that, to the best of our knowledge, there is no existing evidence-based memory aid handbook specifically designed for self-study, the primary objective of this study was to assess the usability of the developed handbook in terms of whether the handbook meets the intended objectives for the use and produces the desired outcome.²⁰ Usability in this context encompasses factors such as learnability, satisfaction, flexibility, efficiency, and effectiveness.²⁰ The use of the memory aid handbook, as it teaches strategies, enables participants to learn and adopt these strategies, leading to changes in their mental representations and subsequent alterations in their behavior while dealing with daily life.⁷ In light of this, we hypothesized that utilizing the memory aid handbook would result in improvements in cognitive performance, daily life functionality, and self-efficacy. To investigate this, we examined the overall usability of the handbook, including the relevance and applicability of the provided strategies.

2 | METHODS

2.1 | Participants

In 2022, we recruited community-dwelling older adults in Germany via convenience sampling using personal contacts, handouts,

contacting interest groups and medical centers. Inclusion criteria were (1) ≥ 60 years old, (2) subjective memory problems with intact cognition (Montreal Cognitive Assessment, MoCA ≥ 26 points) and independent functioning (Instrumental Activity of Daily living according to Lawton, IADL ≥ 7 points), (3) having sufficient vision, hearing, and language comprehension to ensure reliable test performance, and (4) capacity to consent (i.e. not in a delirium). Reasons for exclusion were insufficient capacity to participate in the questionnaires and interview due to neurological diseases (e.g. multiple sclerosis, stroke, dementia, and schizophrenia), mental illness, and/or severe physical limitation.

No one interested in participation had to be excluded. In total, $n = 19$ participants were included in the study. None dropped out over the course of the study. The average age was 76.11 (SD: 8.91). Characteristics of the participants are shown in Table 1. About three quarters of the participants were female, all had more than 12 years of education, and only about one-third had no chronic illness. About half of the sample was cohabiting with a partner.

The study was conducted according to the principles of the Declaration of Helsinki and was approved by the Ethics Committee of the University Medicine Greifswald (BB 068/22). Participants

received no compensation for participating in the study, but were allowed to keep the memory aid handbook after the self-training period.

2.2 | Procedure

Prior to taking part in the study, every participant gave written informed consent. As part of a pre-post design, each participant attended two sessions, either in his/her home or at the research institute. In the first session, participants' demographic characteristics were recorded and inclusion and exclusion criteria were checked. In addition, participants were asked to participate in three cognitive tests and fill out questionnaires on daily life functioning and self-efficacy. After the first session, the memory aid handbook was handed out to the participant. Participants were also given a short introduction of the handbook and were instructed to follow the handbook's 7-week schedule. They were advised to work through the weekly chapters step-by-step, at intervals allowing sufficient time to try out the strategies presented at their own pace. They were asked to take notes, if they noticed inconsistencies, needed additional information, or had any comments. While participants were allowed to manage the time they spent on the handbook flexibly, they were told that it should not exceed 30 min per week. Participants received contact information so they could reach out if they needed assistance during the self-training period (none did). After 7 weeks, in the second session, the same cognitive tests and questionnaires on daily life functioning and perceived self-efficacy were administered, and participants were asked to report on usability of the handbook and relevance of the strategies therein.

2.3 | Memory aid handbook

Based on a systematic review of coping strategies for memory problems in everyday life,¹⁹ the memory aid handbook was developed. The memory strategies that were identified in the systematic review were elaborated thematically by explaining their functioning and applicability in daily life, and by providing examples and illustrations. Strategies were clustered into seven themes. One week was dedicated to each theme so that the handbook was structured to follow a 7-week schedule. Each theme was covered in around 6 pages; in total, the handbook contained 56 pages. The week-by-week format was intended to prevent participants from feeling overwhelmed by the abundance of strategies provided. Themes and associated strategies can be found in the Supplementary Material Table S1.

2.4 | Cognitive tests

We used the Trail-making Test (TMT) by Oswald and Roth²² which measures processing speed and fluid intelligence.²¹ Participants

TABLE 1 Participant demographic characteristics.

Participant characteristics	Frequency (n, %)/(mean, SD)
Gender	
Female	14 (73.68%)
Male	5 (26.32%)
Age	76.11 years (8.91 years)
Min.	60 years
Max.	90 years
Education	
Vocational School (V)	9 (47.37%)
University of Applied Science (VI)	5 (26.32%)
University (VII)	5 (26.32%)
Marital status	
Living alone	9 (47.37%)
Cohabiting	10 (52.63%)
Diagnosed medical diseases	
No chronic diseases	6 (31.58%)
One chronic disease	7 (36.84%)
≥ 2 chronic diseases	6 (31.58%)
SCD	12.17 (2.96)
Min.	6.46
Max.	18.46

Abbreviations: max., maximum age; min., minimum age; n, number of participants; SCD, Subjective Cognitive Decline criteria; SD, standard deviation; %, frequency in the sample in percent.

connect the numbers from 1 to 90 as quickly and accurately as possible in ascending order.²² If a participant made a mistake, (s)he had to go back to the last correct number. The score is the completion time.

The Digit Span Task (DST)²³ captures (auditory) working memory performance. 16 randomly generated digit sequences of increasing length (2 to 9 digits) were generated. Each digit (1, 2, 3, 4, 5, 6, 7, 8, 9) occurred only once in each sequence. The task started with two 2-digit sequences. The length of sequences increased by one up to a 9-digit sequence. Sequences were read to participants. There were two task conditions: forward and backward repetition of the digit sequence. After two consecutive incorrect repetitions, the task was aborted. The total number of correct answers was calculated.

The Stroop Task captures selective attention.²⁴ Participants were shown a list of 20 color-words (e.g. "RED," "BLUE," and "GREEN") printed in different colors. Participants were asked to name the color, in which the word is printed, whilst ignoring the content of the word. There were two types of trials: congruent trials in which the word is presented in its corresponding color (e.g. the word "RED" printed in red ink), and incongruent trials in which the word is presented in a different color to its content (e.g. the word "RED" printed in blue ink). Completion time was recorded.

2.5 | Questionnaires

2.5.1 | Demographic characteristics

Participants reported their age, gender, level of education, marital status, and diagnosed diseases.

2.5.2 | Subjective Cognitive Decline

The Subjective Cognitive Decline (SCD) questionnaire assesses the presence of subjective memory impairment on 14 items, including items on remembering appointments, losing objects, and worries about decreasing memory performance.^{25,26} People who do not perceive any memory difficulties answer only eight questions. In total, the scores range between 0 and 26. Scores ≥ 8 points indicate the presence of subjective memory difficulties. The SCD was also used in the LIFE-Adult study of the Leipzig Research Center of Civilization Diseases.²⁶

2.5.3 | Daily life functionality

The Functional Activity Questionnaire (FAQ)²⁷ assesses 10 different activities of daily living, including cooking, hobbies, take track of and remembering current events. Participants self-rate the items on a 4-point ordinal scale, with higher scores indicating poorer functional status.

2.5.4 | Self-efficacy

The General Self-Efficacy Scale (GSE)²⁸ is a ten-item scale to assess the strength of the participant's belief in their own ability to respond to novel or difficult situations and to overcome associated obstacles or setbacks. Self-rate responses are made on a 4-point ordinal scale, with higher score indicating greater self-efficacy.

2.5.5 | System Usability Scale

The System Usability Scale (SUS)²⁹ contains 10 questions (Likert scale of 1–5) about the usability of products and services. We made only minor adjustments so the that wording related to the memory aid handbook. Half of the items are reverse coded. Item scores are added and multiplied by 2.5. The score indicates the user-friendliness in values up to 100.

2.5.6 | Usability checklist for participants (P-checklist)

A checklist was designed for this study (see Supplementary Material Table S2) to gain better insight into the usability and relevance of strategies in the memory aid handbook that are not covered by the SUS. In a first step, we brainstormed aspects on learnability, satisfaction, flexibility, efficiency, and effectiveness regarding the handbook. In a second step, we clustered the aspects to form questions by topic. In a third step, we tried to combine similar questions into one to reduce the number of questions. In a last step, we checked the appropriateness of the wording of the questions. The checklist consists of 15 items. Seven in yes/no format and eight free text items (six items to expand on their yes/no answers, two items to report on the usefulness of the strategies, one item for further comments).

2.6 | Data analysis

Data analyses were conducted using Stata version 16. Unless indicated otherwise, we used a significance level of $p < 0.05$.

Paired sample *t*-test analyses were performed to determine differences between pre- and post-intervention values in cognitive performance (TMT, DST, and Stroop), daily functioning (FAQ), and self-efficacy (GSE). The assumption of normality was checked using the Shapiro-Wilk test of normality. In cases where this assumption was violated, we used logarithmic transformation. Effect sizes were calculated. To evaluate the handbook's influence on the observed differences, we computed the Reliable Change Index. We set the threshold of 1.96 as indicating a statistically significant difference attributable to the intervention.³⁰

To determine which participant characteristics at baseline were associated with perceived usability (SUS), correlation analyses were performed. Pearson's correlations were used for normally distributed

continuous variables, Spearman's correlations for non-normally distributed continuous variables (TMT, Stroop congruent, and FAQ), and the Kruskal–Wallis test for categorical variables (level of education, marital status, number of diagnosed diseases).

3 | RESULTS

To ascertain that participants met the inclusion criteria, subjective memory problems were assessed using a SCD questionnaire,²⁶ with ≥ 8 points representing subjective memory impairment ($M = 12.17$; $SD = 2.96$). A detailed questionnaire description can be found in the Questionnaires section. Intact cognitive functioning was ensured using the MoCA with its defining threshold ≥ 26 for normal cognitive functioning³¹ ($M = 26.74$, $SD = 0.93$). This criterion ensured that participants enrolled in the study had cognitive abilities within the expected range. Most participants fell within the lower range of normal cognitive functioning in the MoCA score. Independent living skills were assured using the IADL scale³² based on eight chores including food preparation, shopping, housekeeping, telephone, and transport usage. Participants scored ≥ 7 were classified as having independent living skills ($M = 7.74$; $SD = 0.45$). All participants experienced subjective memory problems while having independent living skills and intact cognitive functioning.

All 19 subjects participated in the baseline and follow-up assessment. The average SUS score was 99.21 ($SD 1.19$), which, according to Bangor et al.³³ corresponds to the “best imaginable” usability score. This indicates that all strategies were presented clearly and concisely. We estimated associations between the SUS score and participant characteristics (Table 2). If we were to apply a Bonferroni-corrected significance level of $p < 0.004$ ($0.05/12$), no correlation would be significant. Given our small sample size, such a correction would most likely lead to a type II error. We acknowledge that a majority of the participants assigned the best score to each question on the SUS, resulting in limited variability in their responses.

Regarding the yes/no-items on the P-checklist (see Table 3), none of the participants reported any difficulties in using the memory aid handbook on their own. All participants reported to have known some of the strategies before and two thirds learned new strategies. About 80% of the participants incorporated new strategies in their life. One third did not follow the prescribed 7-week timeline and instead took a flexible approach to trying out strategies.

Comments made on the free-text items contained the following information: All participants were familiar with at least one of the strategies presented in the memory aid handbook, namely the use of a calendar (100%). Other familiar reported by at least half of the participants to be familiar were, in descending order of report frequency: taking notes (73.68%), assigning items to a dedicated storage place (68.42%), organizing the week (63.16%), keeping order (57.89%), and avoiding time pressure by planning in more time (52.63%). The most frequently newly implemented strategies included (in descending order of frequency), self-acceptance (68.42%), visualizing and verbalizing daily routines (63.16%),

TABLE 2 Results of correlation analyses between individual differences and SUS scores.

Variable	Association with SUS	<i>p</i>
Participant characteristics		
Age	0.17	0.497
Education	0.46	0.794
Marital status	1.24	0.265
Number of diagnosed diseases	0.04	0.986
SCD	0.48	0.037
Cognitive performance		
TMT	0.38	0.106
DST forward	0.11	0.640
DST backward	0.01	0.953
Stroop Task congruent	−0.18	0.469
Stroop Task incongruent	0.06	0.794
Daily life functioning		
FAQ	0.40	0.089
Self-efficacy		
GSE	−0.21	0.389

Abbreviations: DST backward, Digit Span Task in the backward condition; DST forward, Digit Span Task in the forward condition; FAQ, Functional Activity Questionnaire; GSE, General Self-Efficacy Scale; *p*, *p*-value; SCD, Subjective Cognitive Decline criteria; Stroop Task congruent, Stroop Task congruent trial; Stroop Task incongruent trial; SUS, System Usability Scale; TMT, Trail-Making Test.

TABLE 3 Participants' perspective on the usability of the memory aid handbook.

P-checklist	Y/N (n, %)
Were you able to use the memory aid handbook without any problems?	19 (100%)/0 (0%)
Did you find the memory aid handbook useful?	18 (94.74%)/1 (5.26%)
Did you follow the pre-made 7-week plan?	12 (63.16%)/7 (36.84%)
Did you already know the strategies presented?	19 (100%)/0 (0%)
Did you learn any new strategies from the memory help handbook?	11 (57.9%)/8 (42.1%)
Do you use any other strategies in your daily life that were not covered by the memory aid handbook?	0 (0%)/19 (100%)
Have you incorporated new strategies into your daily routine?	15 (78.95%)/4 (21.05%)

Abbreviations: N, No-answer to the question of the P-checklist; *n*, number of participants; Y, Yes-answer to the question of the P-checklist.

asking for help (47.37%), doing one thing at a time (36.84%), and relocating the key to a more obvious location (26.32%). In general, participants agree that the most important memory strategy is

using a calendar (100%), followed by taking notes (78.95%), having specific places for certain items (73.68%), establishing routines in daily life (68.42%), keeping order (63.16%), and avoid time pressure (52.63%). None of the participants reported using a strategy in their daily lives that was not covered in the memory aid handbook. In general, none of the participants reported any requests for improvement of the handbook, and all felt validated and more self-confident in their memory strategies. Overall, the P-checklist reveals that three-fourths of the participants experience new incentives for their daily lives.

The means and standard deviations from session 1 and 2 for cognitive performance, daily functioning, and self-efficacy, all show improvement (Supplementary Material Table S3). Results from the paired-sample *t*-test confirmed that participants scored significantly better in cognitive performance and self-efficacy after the 7-week schedule of the handbook (Table 4). However, when considering the Reliable Change Index, only the DST scores and self-efficacy demonstrated reliable changes, as indicated in Table 4. Pre-post-comparison was non-significant for the FAQ, but this may be attributable to a restricted range of scores (range: 0–4).

4 | DISCUSSION

Aim of our study was to evaluate the usability of a new, evidence-based memory aid handbook for older adults with memory problems. Overall, our findings indicate a “best imaginable” usability, as indicated in the SUS score (according to Bangor et al.³³) and the comments our participants made (e.g., the handbook was easily applicable without external help). Given this, we conclude that there

is no need for changes to the memory aid handbook and that it is absolutely suitable for older people with memory problems.

As indicated by the P-checklist, the memory aid handbook had an overall positive effect on participants' understanding and attitudes toward memory strategies by increasing confidence by validation of previously used strategies and by helping older adults optimize their strategy use. In a multi-component behavioral intervention by Smith et al.,³⁴ in which older people were taught memory strategies (e.g. calendar use, writing to-do lists), in addition to physical or cognitive exercise, support groups, and wellness education, older people rated memory strategies as the most important skill learned for sustaining autonomy in daily life. Our handbook is an inexpensive hands-on approach to do so.

We observed significant improvements in one cognitive performance task (DST) and self-efficacy after providing the participants with the memory aid handbook. These are promising results, even though they will have to be confirmed in comparison to a control group. We observed no significant improvements on daily functioning, however, this may be based on a ceiling effect. Participants scored highly on the FAQ with relatively limited variance among scores. Thus, the FAQ may lack the sensitivity necessary to accurately detect pre- and post-intervention differences in our group. Other studies have also reported that supporting older people with memory strategies can improve self-efficacy and memory abilities.¹²

Concerning the strategies in the handbook, participants reported using a calendar, taking notes, having specific places for certain items, and establishing routines in daily life as the most important strategies from the memory aid handbook for their daily lives. This underscores the importance of these strategies and provides grounds to assume that it is worthwhile to recommend these strategies to people with

TABLE 4 Differences between session 1 and session 2 in the outcome measures cognitive performance, daily life functioning and self-efficacy (paired sample *t*-test).

Outcome measure	Mean diff (S2–S1)	SD	95% CI	<i>t</i>	df	<i>p</i>	Cohen's <i>d</i>	RCI
Cognitive performance								
TMT	–0.13	0.11	–0.19 to –0.82	–5.36	18	0.0000	–1.23	–1.25
DST forward	2.26	1.19	1.69 to 2.84	8.26	18	0.0000	1.89	2.66
DST backward	2.16	1.17	1.60 to 2.72	8.06	18	0.0000	1.85	2.53
Stroop Task congruent	–4.95	5.34	–7.52 to –2.37	–4.04	18	0.0008	–0.93	–1.46
Stroop Task incongruent	–0.33	0.27	–0.45 to –0.20	–5.30	18	0.0000	–1.22	–1.48
Daily life functionality								
FAQ	–0.27	0.34	–0.81 to 0.26	–1.62	18	0.2028	–0.81	–0.54
Self-efficacy								
GSE	2.79	1.69	1.98 to 3.60	7.21	18	0.0000	1.65	2.20

Abbreviations: 95% CI, 95% confidence interval; Cohen's *d*, effect size of the difference between session 2 and session 1 for the respective outcome measure; df, degree of freedom; DST backward, Digit Span Task in the backward condition; DST forward, Digit Span Task in the forward condition; FAQ, Functional Activity Questionnaire; GSE, General Self-Efficacy Scale; Mean diff (S2–S1), mean difference between session 2 and session 1 for the respective outcome measure; *p*, *p*-value; RCI, Reliable Change Index for the respective outcome measure; SD, standard deviation; Stroop Task congruent, Stroop Task congruent trial; Stroop Task incongruent trial; *t*, test statistic of the paired *t*-test; TMT, Trail-Making Test.

initial memory problems, despite individual differences in memory problems and daily life situations. Some cognitive rehabilitation interventions already incorporate these strategies, yielding positive effects in perceived quality of life, confidence, and self-efficacy underpinning the importance of those strategies for the daily life of older people.^{15,35}

The memory aid handbook enabled the participants to validate existing strategies (such as the utilization of a calendar, taking notes, associating items with a dedicated storage place) in addition to providing incentives for developing new strategies or revising old ones, such as self-acceptance, visualizing and verbalizing daily routines, and asking for help. This suggests that people experiencing memory problems remain receptive to suggestions aimed at reviewing and adjusting their own habits. The onset of memory problems thus appear an opportune moment to intervene, confirming the recommendations of Ross and Rodriguez⁷ to provide assistance in the initial phases of memory problems to prevent further problems and maintain adequate functioning in daily life, which could reduce the amount of assistance needed. A multidimensional memory program including education about age-related memory changes and training in memory strategy for older adults reveal effects retention of acquired memory strategies and reduced need for memory-related medical care following the program.³⁶ In contrast to our self-paced memory aid handbook, the program consisted of weekly on-site training and educational sessions that were interactive and practical in nature. This highlights the potential benefits of preventative healthcare practices in aiding older people with appropriate memory strategies to remain independent in daily life and thereby reducing the burden on healthcare systems.

The study is limited by a small sample size, which allows us to draw conclusions on usability but reduced the statistical power of the other results. The generalizability and robustness of the results may also be limited by the pre-post design, convenience sampling, and statistical methods used. Thus, results should be interpreted with caution. Further studies may validate the clinical effectiveness of the handbook with patients in early stages of dementia, using a control group. It is also unclear until what stage of cognitive impairment the handbook is useful. With deteriorating cognitive abilities, there probably is a point after which the person is not capable to learn new strategies anymore. Further, usability, daily functioning, and self-efficacy are the participants' subjective perceptions. Objective evaluations by external observers might provide more reliable insight. We cannot fully exclude the possibility that factors such as depression or medication use may have affected participants' memory. Therefore, these and additional factors may have played a role in self-reported memory problems. Since the memory aid handbook followed a self-study approach, we could not monitor the participants' completion of the 7-week plan. However, when we inquired about the relevance of the strategies outlined in the handbook, we found no inconsistencies that contradicted the handbook's content, suggesting that the handbook's self-study approach was feasible. Despite these limitations, the current study supports the usefulness and applicability of the developed memory aid handbook for older people with memory problems.

5 | CONCLUSION

Overall, the usability of the memory aid handbook given a usability score corresponding to "best imaginable." Thus, it seems to be helpful for people with memory impairments in validating and rethinking already established strategies while teaching new strategies. Older people in their initial stage of memory problems are capable of learning new strategies and, with the right instructions, they may be capable to better manage memory problems. This would help them to live independent lives. General practitioners could recommend the memory aid handbook to older people who complain of memory problems as an additional aid in everyday life alongside medical care. If these strategies prove useful to everyday functioning they may potentially allow people to remain at home for longer.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

CONSENT FOR PUBLICATION

Not applicable.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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