

Pilot testing a couples-focused intervention for mild cognitive impairment

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Abstract

The purpose of this pilot study was to evaluate the acceptability, feasibility, and potential benefits of the multi-component Daily Enhancement of Meaningful Activity (DEMA) intervention, which was tailored to help couples facing mild cognitive impairment (MCI) work together to meet goals, remain engaged in meaningful activities, and adapt to changes over time. Using a single-group design, 10 persons with MCI and their family caregivers were recruited to receive DEMA over six bi-weekly sessions. Data were collected pre- and at one week and three months post-intervention. Consent, session, and questionnaire completion rates indicated the program and study procedures were well accepted. Qualitative and quantitative findings indicated positive trends in meaningful activity performance and maintenance of health-related outcomes, as well as high program satisfaction. The DEMA is a potentially promising intervention that will need further testing in a randomized clinical trial.

Key words: Mild cognitive impairment, functional performance, dyadic patient/family caregiver, quality of life

Title: Pilot Testing a Couples-focused Intervention for Mild Cognitive Impairment

Affecting almost 20% of American older adults, mild cognitive impairment (MCI) is characterized by impairments in memory, language, or other mental function severe enough to interfere with daily life, but not meeting full dementia diagnostic criteria (Alzheimer Association, 2011; Ward, Arrighi, Michels, & Cedarbaum, 2012). Persons with MCI (PwMCI) experience difficulties that decrease quality of life. Their functional decline often leads to disengagement from usual, meaningful activities (Burton, Straussa, Bunceb, Huntera, & Hultscha, 2009). Engagement in meaningful activities is important for maintaining an active, healthy lifestyle (Lawton, 2001). Disengagement often begins a downward trajectory toward premature disability (Burton, et al., 2009). The adverse effect that MCI has on functioning places additional demands on patients and families as they cope with an uncertain diagnosis, dealing with symptoms, and changing family relationships and functioning (Blieszner & Roberto, 2010; Ryan et al., 2010).

Existing interventions for MCI patients and caregivers are often single dimensional, focused on memory or physical activity (Jean, Bergeron, Thivierge, & Simard, 2010); a few studies on early dementia patient-caregiver dyads focus on future care issues (Whitlatch, Judge, Zarit, & Femia, 2006). The absence of multi-faceted supportive care interventions for MCI patients and their caregivers is striking (Blieszner & Roberto, 2010; Ryan, et al., 2010), especially when one considers the very high rate of conversion from MCI to Alzheimer disease (AD); (Davatzikos, Bhatt, Shaw, Batmanghelich, & Trojanowski, 2011). To address the need for a multi-faceted supportive care interventions, we developed the multi-component, tailored Daily Enhancement of Meaningful Activity (DEMA) intervention. DEMA aims to help couples facing MCI supportively work together to meet goals, remain engaged in meaningful activities, and adapt to changes over time.

Theoretical Basis of DEMA Intervention

DEMA is based on (1) gerontological theory (Lawton, 1990); (2) the Model of Human Occupation (Kielhofner, 2002); (3) components of Problem-Solving Therapy (PST) (Unützer et al., 2002); and 4) patients' and caregivers' experiences with MCI (Lu & Haase, 2009; Lu, Haase, & Farran, 2007). Content validity and preliminary evidence of acceptability of DEMA are described elsewhere (Lu & Haase, 2011).

Study Purpose

We aimed to explore acceptability, feasibility, and potential benefits of DEMA. Hypothesized benefits were: increased performance deficits awareness, improved performance of and satisfaction with meaningful activities, greater satisfaction with communication, improved physical function, greater sense of well-being; and improved quality of life; fewer depressive symptoms; and maintained or improved cognitive function (PwMCI), and reduced care burden (caregiver).

Method

Design and Sample

A longitudinal, single-group, pre-post intervention design was used. The study was approved by the university's institutional review board, prior to recruiting a non-probability sample. To be included, the PwMCI and caregiver (dyad) had to dwell in the same household, be able to read and speak English, and have telephone access. PwMCI participants had to meet established MCI classification criteria. Excluded were those with significant neurologic disease other than suspected incipient AD or current major depression (Winblad et al., 2004). Caregivers needed to provide primary, unpaid care to their partner and have a 6-item MMSE score of = or > 5. The dyads were willing to meet the clinic or lived within 30 miles of the clinic. Of 28 dyads approached at the University AD Center and the Healthy Aging Brain Center, 12 dyads consented to participate, and 10 completed all study-related activities. The dyads' ethnicity were: Caucasian (9, 90%) and Arabic (1, 10%). PwMCI were mostly male (7, 70%), with mean age

69.2 ($SD = 8.0$) years, mean education 15.3 ($SD = 2.8$) years, mean time since diagnosis 4.8 ($SD = 4.15$) years, mean MMSE score 27.1 ($SD = 1.9$); employment status was 7 (70%) retired, 2 (20%) retired with part-time job, and 1(10%) with full-time job. Most caregivers were female (7, 70%) with mean age 66.0 ($SD = 10.6$) years and education 14.0 (2.6) years.

Measures

Feasibility/ acceptability was evaluated by the number of sessions dyads attended; time spent on DEMA; and individual ratings of treatment satisfaction; the extent to which session goals were met, and a study-specific, rating of written information, specific components of DEMA implementation, and weekly project planning activities (Table 1).

To evaluate benefits, PwMCI completed 11 measures and caregivers completed 3 (see Tables 2 and 3). All measures had reported acceptable Cronbach's alpha values between .72 and .95. *Dyad congruence in awareness of functional ability* refers to the extent of agreement between patient and caregiver ratings of patient functional ability. It was measured by the mean differences on the Dementia Deficits Scale (DDS). Lower scores indicate lower levels of deficits awareness, and lower mean differences indicate higher dyad congruence. *Meaningful activity performance and satisfaction* were measured by performance and satisfaction items of the 10 point ratings of the Canadian Occupational Performance Measure (COPM). In this instrument, meaningful activities are divided into five categories: personal care, physical, leisure quiet, productive, or social. Higher scores reflect, respectively, greater meaningful daily activities performance and satisfaction, as perceived by the PwMCI. *Satisfaction with communication* was measured by the Communication and Affective Expression Subscales of Family Assessment Device (CAES-FAD) measures and by the Expressive Support Scale (ESS), which measures perceived family support. Higher scores indicate better satisfaction with family communication and better family support. *Physical function* was measured by the Alzheimer Disease Cooperative Study-Activities of Daily Living Scale (ADCS-ADL), which has been used to

assess performance functioning in PwMCI. Higher scores indicate better physical functioning. *Depressive symptoms* were assessed by the nine-item Patient Health Questionnaire (PHQ-9). Higher scores indicate more depressive symptoms. *Cognitive function*, specifically executive function, was measured by the Controlled Oral Word Association (COWA) Test, and the Trail Making Tests A and B. COWA assesses verbal fluency, with higher scores indicating better verbal fluency. The Trail Making Tests measure cognitive function. Longer completion times indicate poorer level of executive function. *Sense of well-being* was measured by the two-item General Health subscale of the SF-36. Higher scores indicate poorer self-perceived general health. *Quality of life* was measured by the Quality of Life-Alzheimer Disease (QoL-AD). Higher scores indicate better quality of life. *Care burden* was measured by a self-report inventory, the Caregiving Burden Scale (CBS). Higher scores indicate higher levels of burden.

Procedures

The 12 PwMCI-caregiver dyads were fully informed about the study and procedures in person and on a follow-up phone call prior to consent. Signed consent forms were returned by mail, at least one week prior to the scheduled baseline assessment. Baseline measures (Time 1, T1) were administered to the PwMCI by a research assistant and to the caregiver by the first author, in separate, private clinic rooms. Times and place for the six sessions were determined based the dyad's preferences, in either a campus conference room or the participant's home. Then, to begin tailoring the intervention, the couple was separately asked about the patient's level of awareness of his or her performance abilities, types and frequencies of meaningful activities the PwMCI and/or couple engaged in, and perceived barriers to engaging in these activities. Following the baseline assessment, each dyad had six bi-weekly, face-to-face sessions with a nurse intervener that lasted from 55 to 70 minutes. Sessions are described below.

Session 1 focused on introducing the DEMA and meaningful activity concepts, reviewing the PwMCI's history of meaningful activity, establishing a manageable meaningful activity plan,

and introducing the six areas for counseling topics. The dyad then set goals and developed a plan for activities they considered important and meaningful. During the two weeks between sessions, participants worked on the agreed-upon goals and activities, either as a couple or individually. Sessions 2 to 6 had 2 parts. For Part 1, 30-40 minutes were focused on the specific meaningful activity that had been planned during the previous session, including (a) assessing any concerns related to engaging in the activity, (b) reviewing the nature and frequency of existing meaningful activity patterns, (c) using problem-solving to assess the current week's activity plan and making needed modifications, and (d) identifying ways to maintain activity engagement. In each Session, Part 2 lasted 20-30 minutes, and focused on one of dyad selected six self-management topics. Between sessions, the PwMCI engaged in their self-selected activities with caregiver support. Time 2 (T2, post-intervention) and Time 3 (T3, three months post-intervention) measures were administered to eight dyads in separate, private clinic rooms and to two dyads in separate rooms in the homes.

Descriptive statistics computed for outcomes included means and standard deviations at each measurement point. Cohen's *d* measure of effect size (Cohen, 1988) was calculated for changes at T2 and T3 relative to T1. The analyses were completed using the SAS version 9.2 computer program (SAS Institute, 2008).

Results

Acceptability

Acceptability was evaluated using means and standard deviations of program evaluation items. Dyads' separately rated acceptability (Table 1). Overall, mean acceptability was 4.55 (*SD* = .59) by the PwMCI and 4.33 (*SD* = .72) by the caregivers. Written Information components of DEMA, DEMA Program implementation, and Project Plan acceptability ranged from 4.50 to 4.57 (PwMCI) and 4.00 to 4.70 (caregivers). Dyads planned to continue using the program (PwMCI: *M* = 4.60, *SD* = .70; caregiver *M* = 4.20; *SD* = 1.23), and would recommend the

program to others with memory problems (PwMCI: $M = 4.70$, $SD = .48$; caregiver: $M = 3.78$, $SD = 1.48$).

[Insert Table 1]

Feasibility

The consent rate was 42.9 % ($n = 12$). Among the 16 of 28 dyads approached, who declined, most lived outside of catchment areas and driving distance was so far to come to clinic. The attrition rate was 17%, attrition were two dyads dropped out before T2 due to major health problems (e.g., stroke and died from heart attack). Ten of the 12 dyads completed all sessions and measures, an 83% completion rate. Session delivery timing was consistent with the protocol timeline predicted, with the few scheduling conflicts being easily rescheduled. Mean session duration was 60.3 minutes ($SD = 2.74$), very close to the expected 60 minutes. All 12 enrolled PwMCI-caregiver dyads completed the measures at T1 and all 10 remaining dyads completed measures at T2 and T3. Mean measurement completion time was 120.3 ($SD = 3.92$) minutes for PwMCI and 59.3 ($SD = 1.73$) minutes for caregivers. There were no missing data.

Potential Benefits. Descriptive statistics computed for outcomes included means and standard deviations. Cohen's d measure of effect size (Cohen, 1988) was calculated for changes at T2 and T3, relative to T1. The analyses were done with SAS, version 9.2 (SAS Institute, 2008).

Meaningful activity performance and satisfaction. Means, standard deviations, and effect sizes for change relative to T1 for meaningful activity performance and satisfaction at T1, T2, and T3 are summarized in Table 2. All effect sizes indicated improvement relative to T1, ranging from .70 to 2.14 on meaningful activity performance and .70 to 2.39 on meaningful activity satisfaction, representing large effect sizes as defined by Cohen (Cohen, 1988) .

[Insert Table 2]

Meaningful activity distal outcomes. Means, standard deviations, and effect sizes for change relative to T1 for meaningful activity distal outcome variables are presented in Table 4. Four of the distal outcome variables demonstrated small to medium (i.e., .20 - .50) effect sizes for improvement from T1 to T2, including the PwMCI DDS, ADCS-ADL, Trail-B, and Burden. The ESS measure demonstrated a large effect size improvement (-.58) from T1 to T2. Small to medium effect sizes were observed for improvement from T1 to T3 for Trail-A and Caregiver DDS, while PwMCI DDS demonstrated a large effect size for improvement. Small to medium effect sizes were observed for improvement from T1 to T3 for Trail-A and Caregiver DDS, while PwMCI DDS demonstrated a large effect size for improvement. Other distal outcome variables (i.e., EES, CARS-FAD, ADCS-ADL, PHQ-9, General Health subscale, IADL-QoL, and CBS measures) had less than small effect sizes, and ESS showed worsening from T1 to T3.

[Insert Table 3]

Discussion

Acceptability and Feasibility

The findings show that DEMA is acceptable and feasible and has potential benefit for PwMCI and caregivers. Two examples from six written unsolicited written comments support quantitative evaluation of acceptability:

MCI Patient (#4): “When we started to analyze the ‘barriers’ to meaningful activity, I began to realize just how much I would benefit from better control and wiser use of my time...I started to really look at what I was/was not doing and when I was doing it and why I did it... When I began to really involve my wife in my analytical process, I began to “reap the harvest.” As we worked together on choosing ‘what’ and ‘when’ it became easier for her to support what I choose to do and her suggestions were very helpful.”

Caregiver (#9): “I personally am grateful for your help in making me realize I need to reach out for help... and I should not feel guilty... The self-management tool kit was also very

informative and well organized. The progression of information from session to session was particularly well placed. The list of resources is one we will make reference to as time goes on.”

Positive Focus. Most interventions for adults with memory problems only provide information or focus on physical exercise. DEMA encourages engagement in activities that are already familiar and meaningful, and thus does not overwhelm PwMCI, who have difficulty learning new information and skills (Albert et al., 2011). DEMA addresses interrelated needs by focusing on dyad’s existing strengths and coping skills through the problem-solving therapy.

Opportunities for Improvement. To increase accessibility of the intervention and reduce cost, changing the delivery mode to phone calls or internet interventions should be considered in future studies. Throughout the study, we learned ways to improve the measurement process, weekly meaningful activity plan, and the Self-management Tool Kit. For example, placing a large printout of the Likert scale on the table while reading each question for the participant helped maintain the PwMCI’s attention and comprehension of the measures.

Potential Benefit

The results showed increased congruence in awareness of functional ability among dyads at T2. At T3, this awareness was still above baseline, but less than at T2. These findings may be due to dyads’ improved communication, meaningful activities performance, and feedback on self-management strategies. The decline in congruence from T2 to T3 may reflect a need for longer term assistance in helping caregivers evaluate functional ability. At the three-month follow-up, the PwMCI perceived higher levels of meaningful activity engagement than at T1. This finding is consistent with the desire of PwMCI to preserve their ability to perform daily meaningful activities, expressed in qualitative data described elsewhere (Lu et al., 2007). However, the higher engagement levels also could be the result of couples naturally adapting to MCI over time, rather than DEMA.

One unexpected result was the worsening of communication satisfaction, indicated by a reduction in Expressive Support Scale (ESS) scores at T2, with a medium effect size. However, by T3, there was relatively little difference in the ESS score relative to T1. The slight increases in communication satisfaction and decreased emotional support found at T3 were seemingly contradictory. These findings could be a result of participants being unable to sustain emotional support over time. Another possibility, suggested by our qualitative data, is that the four couples with decreased scores had other, unrelated family problems they were dealing with.

The potential findings of DEMA benefits trends should be interpreted very cautiously due to several limitations: (1) absence of a control group a substantial threat to internal validity and small sample size with limited power making, it impractical to rely on inferential tests and statistical significance to evaluate DEMA effects; (2) sample size too small to calculate the measures' Cronbach's alpha reliability; (3) use of self-reports of activity engagement performance; and, (4) data collection for caregivers and intervention delivery done by the same person, because of limited resources. It could be a threat to internal and external validity. Key changes recommended in future testing of DEMA include: (1) using a two-group, randomized trial design with a more representative sample; and, (2) evaluating benefit sustainability and life satisfaction (emotions, attitudes, expectations, and thoughts about an individual's situation in life), which is associated with meaningful activity engagement and performance.

Conclusion and Implications

Findings of this longitudinal, single-group pilot study indicated DEMA is acceptable and feasible. Evaluation of outcomes showed some potentially promising results; however, DEMA needs to be evaluated alongside a comparison group to better estimate intervention effect sizes. Despite the unexplained reduced perceptions of emotional support at T2, DEMA was well accepted by participants and may have benefits for physical and emotional health. The information from this study provided guidance for further strengthening the intervention for a

larger, randomized study. If further research indicates effectiveness, DEMA provides gerontological nurses with a means to incorporate a strengths-based, dyadic approach to address PwMCI and caregivers' needs. More importantly, DEMA may provide a means to assist PwMCI and their caregivers to learn ways to continue engaging in meaningful activities. Continued engagement in meaningful activities may ultimately reduce the health care burden on society by slowing the decline in functioning, relationships, mood, and quality of life.

References

- Albert, M. S., Dekosky, S. T., Dickson, D., Dubois, B., Feldman, H. H., Fox, N. C., . . . Phelps, C. H. (2011). The diagnosis of mild cognitive impairment due to Alzheimer's disease: Recommendation from the National Institute on Aging and Alzheimer's Association Workgroup *Journal of Alzheimer Association: Alzheimer's & Dementia* 7(3), 270-279.
- Alzheimer Association. (2011). Alzheimer's disease facts and figures. *Alzheimer's & Dementia*, 7(2), 1-68. Retrieved from http://www.alz.org/alzheimers_disease_facts_and_figures.asp website:
- Blieszner, R., & Roberto, K. A. (2010). Care partner responses to the onset of mild cognitive impairment. *The Gerontologist*, 50(1), 11-22.
- Burton, C. L., Strauss, E., Bunceb, D., Hunter, M. A., & Hultsch, D. F. (2009). Functional abilities in older adults with mild cognitive impairment. *Gerontology*, 55(5), 570-581. doi: 10.1159/000228918
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum Association, Inc.
- Davatzikos, C., Bhatt, P., Shaw, L. M., Batmanghelich, K. N., & Trojanowski, J. Q. (2011). Prediction of MCI to AD conversion, via MRI, CSF biomarkers, and pattern classification. 32(12), e19-27. Retrieved from
- Jean, L., Bergeron, M., Thivierge, S., & Simard, M. (2010). Cognitive intervention program for individuals with mild cognitive impairment: Systematic review of the literature. *American Journal Geriatric Psychiatry*, 18(4), 281-296.
- Kielhofner, G. (2002). *The model of human occupation: Theory and application*. Baltimore, MD: Lippincott Williams & Wilkins.
- Lawton, M. P. (1990). Residential Environment and self-directedness among older people. *American Psychologist*, 45, 638-640.

- Lawton, M. P. (2001). Physical environment of the person with Alzheimer's disease. *Aging and Mental Health*. *Aging and Mental Health*, 5(suppl. 1), S56-S64.
- Lu, Y. Y.-F., & Haase, J. E. (2011). Content Validity and acceptability of the daily enhancement of meaningful activity program intervention for mild cognitive impairment patient-spouse dyads. *Journal of Neuroscience Nursing* 43(6), 317-328.
- Lu, Y. Y. F., & Haase, J. E. (2009). Perspectives of experience of being caregivers of spouse with mild cognitive impairment. *Current Alzheimer Research*, 6(4), 384-391.
- Lu, Y. Y. F., Haase, J. E., & Farran, C. J. (2007). Perspective of persons with mild cognitive impairment: Sense of being able. *Alzheimer's Care Quarterly*, 8(1), 45-86.
- Ryan, K. A., Weldon, A., Huby, N. M., Persad, C., Bhaumik, A. K., Heidebrink, J. L., . . . Giordani, B. (2010). Caregiver support service needs for patients with mild cognitive impairment and Alzheimer disease. *Alzheimer Disease & Associated Disorders*, 24(2), 171-176.
- SAS Institute, I. (2008). *SAS/STAT 9.2 User's Guide*. Cary, NC: SAS Institute, Inc.
- Unützer, J., Katon, W., Callahan, C. M., Williams, J. W., Jr., Hunkeler, E., Harpole, L., . . . Impact Investigators. Improving Mood-Promoting Access to Collaborative Treatment. (2002). Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. *JAMA*, 288(22), 2836-2845.
- Ward, A., Arrighi, H. M., Michels, S., & Cedarbaum, J. M. (2012). Mild cognitive impairment: Disparity of incidence and prevalence estimates. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, 8(1), 14-21.
- Whitlatch, C. J., Judge, K., Zarit, S. H., & Femia, E. (2006). Dyadic intervention for family caregivers and care receivers in early-stage dementia. *The Gerontologist*, 45(5), 688-694.
- Winblad, B., Palmer, K., Kivipelto, M., Jelic, V., Fratiglioni, L., Wahlund, L. O., . . . Petersen, R. C. (2004). Mild cognitive impairment-- beyond controversies, towards a consensus: A

report of international working group on mild cognitive impairment. *Journal of Internal Medicine*, 256(3), 240-246.

Key Points

Engaging in meaningful activities is important to people, because it stimulates social and cognitive functioning, improves physical and mental health, and reduces risk of cognitive decline. Mild cognitive impairment (MCI) affects nearly 20% of American older adults and is associated with risk for Alzheimer's disease, functional decline, and depression, yet few multi-faceted interventions are implemented. The daily enhancement of meaningful activities (DEMA) program incorporates a skill training approach tailored to the MCI patient-caregiver dyads' strengths and goals. Although DEMA participants experienced health outcomes benefits from the well accepted intervention, a technology-based delivery that more easily incorporates it into practice could improve the intervention's feasibility.

Table 1. Descriptive Statistics for DEMA Intervention Program Overall Acceptability (N = 10 dyads)

Program Evaluation Items	PwMCI	Caregiver
	Mean (SD)	Mean (SD)
<u>Overall evaluation</u>	4.55 (.59)	4.33 (.72)
<u>About written information material</u>	4.57 (.57)	4.70 (.55)
I had no trouble understanding the written information.	4.70 (.48)	4.60 (.97)
I think the written information is easy to read	4.60 (.52)	4.70 (.48)
The information given me was presented in a way that was easy to follow.	4.40 (.97)	4.80 (.42)
<u>About the DEMA program implementation</u>	4.57 (.57)	4.28 (1.02)
I think the DEMA program is....		
user-friendly	4.80 (.42)	4.44 (1.01)
useful	4.70 (.95)	4.50 (.97)
credible	4.70 (.67)	4.50 (.97)
taught me new things	4.60 (.70)	4.50 (1.50)
conveniently arranged	4.44 (.53)	4.70 (.48)
personally relevant	4.20 (1.32)	4.50 (.97)
too much information	1.60 (.84)	1.00 (.00)
I would like to suggest other persons with memory problem use the DEMA program	4.70 (.48)	3.78 (1.48)
I am going to use the DEMA program	4.60 (.70)	4.10 (1.20)
I had no problem following the DEMA program	4.50 (.97)	4.20 (1.23)
<u>About the Weekly Project Plan</u>	4.50 (.62)	4.00 (.60)
I think the weekly project plan is...		
user-friendly	4.60 (.52)	4.40 (1.01)
a good choice for this program	4.60 (.52)	4.67 (.50)
I will continue to use the weekly project plan in my daily life	4.43 (.53)	4.10 (1.19)

Note: Values based on 5-point Likert Scale: 5 = *Strongly agree*; 4 = *Have some agreement*, 3 = *No opinion*, 2 = *Some disagreement*, 1 = *Don't agree*. Partial items of DEMA acceptability Evaluation form are presented on the Table 1 due to page limited requirement.

Table 2. Descriptive Statistics and Effect Sizes (ES) for Meaningful Activities Performance and Satisfaction.

	T1	T2	T2 vs. T1	T3	T3 vs. T1
	Mean (SD)	Mean (SD)	ES (df)	Mean (SD)	ES (df)
<u>Personal Care</u>					
Performance ¹	3.57 (3.15)	7.78 (1.62)	1.58 (7)	7.56 (1.29)	2.01 (6)
Satisfaction ¹	3.43 (2.88)	7.67 (1.64)	1.62 (7)	7.25 (1.58)	1.63 (6)
<u>Physical Activity</u>					
Performance	2.83 (2.56)	6.69 (2.50)	1.54 (6)	6.81 (1.89)	2.14 (6)
Satisfaction	2.83 (2.56)	6.69 (2.15)	1.93 (6)	6.94 (2.04)	2.39 (6)
<u>Social Activity</u>					
Performance	3.50 (3.53)	8.33(1.03)	1.27 (2)	8.00(1.26)	0.91 (2)
Satisfaction	4.00 (2.83)	8.25(1.08)	1.41 (2)	8.17(1.47)	0.91 (2)
<u>Leisure Activity</u>					
Performance	2.00(3.46)	7.17(2.32)	1.18 (2)	6.60(3.84)	0.7 (2)
Satisfaction	2.67(3.05)	7.83(0.75)	1.18 (2)	6.60(3.85)	0.7 (2)
<u>Productive Activity</u>					
Performance	4.33(2.34)	7.60(0.89)	1.47 (4)	8.17(0.75)	1.41 (5)
Satisfaction	4.33(2.33)	7.83(1.17)	1.69 (4)	8.00(1.10)	2.12 (5)

Note: ES is Cohen's *d* : mean of difference /standard deviation of difference. Reference: ¹Law, M., Baptiste, S., Carswell, A., McColl, M. A., Polatajko, H., & Pollock, N. (1994). *Canadian Occupational Performance Measure* (2nd ed. ed.). Toronto, ON: CAOT Publications ACE

Table 3. Descriptive Statistics and ES for Distal outcome variables (N = 10).

	<u>T1</u>	<u>T2</u>	<u>T2 vs. T1</u>	<u>T3</u>	<u>T3 vs. T1</u>
MCI Patients	Mean (SD)	Mean (SD)	ES (df)	Mean (SD)	ES (df)
<u>Awareness of Functional Ability</u>					
DDS ¹ (PwMCI)	10.80 (6.54)	9.3 (8.0)	-.31	7.4 (5.83)	-1.33
<u>Satisfaction with communication</u>					
ESS ²	25.6 (2.99)	23.7 (2.45)	-.58	23.8 (3.16)	-.08
CARS-FAD ³	36.7 (5.67)	37.5 (5.80)	.15	37.3 (5.94)	.10
<u>Physical Function</u>					
ADCS-ADL ⁴	46.1 (6.94)	45.0 (4.81)	-.30	46.2 (5.87)	.03
<u>Depressive symptoms</u>					
PHQ-9 ⁵	4.7 (4.13)	4.70 (4.83)	.0 -	5.1 (4.84)	.09
<u>Cognitive Function (Executive)</u>					
COWA ⁶	40.2 (13.13)	40.3 (13.78)	.02	41.3 (14.24)	.24
Trail Marking Test-A ⁷	48.0 (23.09)	47.8 (26.61)	-.01	42.1 (16.86)	-.36
Trail Marking Test-B ⁷	149.9 (88.58)	138.5 (70.89)	-.27	135.9 (83.62)	-.004
<u>Sense of Well-being</u>					
General Health Subscale ⁸	51.5 (25.61)	52.0 (22.14)	.03	52.5 (17.36)	.07
<u>Quality of Life</u>					
IADL-Qol ⁹	38.4 (7.38)	37.9(8.16)	-0.11	38.3 (7.73)	-.002
Caregiver					
<u>Awareness of Functional ability</u>					
DDS (Caregiver) ¹	15.1 (5.82)	12.2 (3.85)	-.18	13.3 (4.94)	-.33
<u>Care Burden</u>					
CBS Scale ¹⁰	21.3 (11.55)	19.70 (11.22)	-.21	21.0 (13.32)	-.06

Note: ES is Cohen's *d*: mean of difference /standard deviation of difference. References: ¹ Snow, A. L., Norris, M. P., Doody, R., Molinari, V. A., Orengo, C. A., & Kunik, M. E. (2004). Dementia Deficits Scale. Rating self-awareness of deficits. *Alzheimer Disease & Associated Disorders*, 18(1), 22-31; ² Miller, I. W., Epstein, N. B., Bishop, D. S., & Keitner, G. I. (1985). The McMaster Family Assessment Device: Reliability and validity. *Journal of Marital and Family Therapy*, 11(4), 345-356; ³ Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *Gerontologist*, 30(5), 583-594; ⁴ Garand, L., Dew, M. A., Eazor, L. R., DeKosky, S. T., & Reynolds, C. F., 3rd. (2005). Caregiving burden and psychiatric morbidity in spouses of persons with mild cognitive impairment. *International Journal of Geriatric Psychiatry*, 20(6), 512-522; ⁵ Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measures *Journal of General Internal Medicine*, . 16(9), 606-613; ⁶ Lezak, M., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological Assessment* (4th ed.). New York: Oxford University Press; ⁷ Greenlief, C. L., Margolis, R. B., & Erker, G. J. (1985). Application of the Trail Making Test in differentiating neuropsychological impairment of elderly persons. *Perceptual and Motor Skills*, 61(3 Pt2), 1283-1289; ⁸ Ware, J. E., & Kosinski, M. (1994). *SF-36 Physical & Mental Health Summary Scales: A Manual for Users of Version 1* (2nd ed.). Lincoln, Rhode Island: QualityMetric Incorporated; ⁹ Logsdon, R. G., Gibbons, L. E., McCurry, S. M., & Teri, L. (2002). Assessing quality of life in older adults with cognitive impairment. . *Psychosomatic Medicine*, 64(3), 510-519; ¹⁰ Zarit, S. H., Todd, P. A., & Zarit, J. M. (1986). Subjective burden of husbands and wives as caregivers: a longitudinal study. *Gerontologist*, 26(3), 260-266.