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Depression and Suicidal Ideation During Two Psychosocial Treatments in Older Adults with Major Depression and Dementia

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Abstract

Background—Depression is prevalent in dementia and contributes to poor outcomes for patients and their families. Antidepressants have limited efficacy in older adults with major depression and dementia and psychosocial interventions are under-investigated.

Objective—To examine the course and predictors of depression and suicidal ideation during 12 weeks of home-delivered Problem Adaptation Therapy (PATH) vs. Supportive Therapy for Cognitively Impaired Older Adults (ST-CI) in 39 older adults with major depression and dementia.

Methods—Thirty-nine older adults with major depression, mild or moderate dementia, and disability participated in an RCT that compared the efficacy of PATH versus ST-CI. Depression and suicidal ideation were assessed with Cornell Scale for Depression in Dementia (CSDD) Total Score and Suicide Item.

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DISCLOSURES

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Results—PATH participants had significantly greater reduction in depression than ST-CI participants over 12 weeks of treatment. PATH participants with high social support had the greatest reduction in depression. Both treatments had comparable reduction in suicidal ideation.

Conclusion—PATH is more effective in reducing depression in older adults with major depression and dementia compared to ST-CI. These results are clinically significant as antidepressant medication treatments have limited efficacy in this population. Home-delivered psychosocial treatments may reduce suicidal ideation in this population.

INTRODUCTION

Depression is prevalent in dementia (rates ranging from 20–60% depending on the severity of depression) and contributes to poor patient and caregiver outcomes [1, 2]. Clinically diagnosed depression and dementia are associated with increased morbidity and mortality, reduced time to institutionalization, impairment in social and interpersonal functioning, and decreased quality of life for patients and caregivers [3–11].

Despite the detrimental consequences of depression and dementia, viable treatments options are limited for older adults with clinically diagnosed depression and dementia. Antidepressants have limited efficacy in depressed older adults with dementia [12–13], and psychosocial interventions for older adults with clinically diagnosed depression and dementia are under-investigated. We use the term “psychosocial interventions” to encompass not only traditional psychotherapy but also psychoeducation, self-help and support groups, case management, and psychosocial rehabilitation; such interventions are common in treatment of memory disorders [14]. Most psychosocial interventions for depression in dementia, tested in randomized clinical trials, focus on older adults with depressive symptoms or milder non-diagnosed depression [15, 16]. Exceptions include a behavioral treatment for depression in dementia, which focuses on caregiver techniques to reduce depression in older adults with dementia and diagnosed minor or major depression [17] and a behavioral activities intervention for nursing home residents with dementia and a diagnosis of a depressive disorder [18]. However, the former treatment focuses mainly on patients with moderate to severe dementia, while the latter targets nursing home residents with varying degrees of depression. Therefore, none of these treatments focus on community dwelling older adults with mild to moderate dementia and major depression. Psychosocial interventions for this population are sparse.

Two home-delivered psychosocial interventions are designed to address the needs of cognitively impaired, older adults with major depression: Problem Adaptation Therapy (PATH) and Supportive Therapy for Cognitively Impaired Older Adults (ST-CI). PATH is a new home-delivered psychosocial intervention designed to reduce depression and disability in older adults with major depression and cognitive impairment, ranging from mild cognitive deficits to moderate dementia [19, 20]. PATH aims to reduce depression and disability by improving emotion regulation skills. To achieve emotion regulation, PATH utilizes a problem solving approach, employs environmental adaptations and compensatory strategies to bypass the patients’ cognitive, behavioral and functional limitations, and selectively engages caregiver to participate in treatment. ST-CI is a home-delivered treatment for

depressed older adults with cognitive impairment that consists of nonspecific therapeutic factors, including empathetic listening, reflection, understanding, and encouragement. In a randomized controlled trial in older adults with major depression and cognitive impairment, ranging from mild cognitive deficits to moderate dementia, PATH participants had greater reduction of depression and disability than ST-CI participants over 12 weeks [19]. The present study focuses on those participants of the original study who had dementia.

Major depression is the most frequent diagnosis associated with suicide risk in older adults, according to psychological autopsy studies [21, 22]. Suicide in dementia is under-investigated and findings are inconclusive. Even though suicide risk and behavior appears to decline with increased cognitive impairment, recently diagnosed patients may be at higher risk [20, 21]. Suicide risk factors in dementia include depression, suicidal ideation, hopelessness, and lack of response to anti-dementia drugs [23]. To our knowledge, no study has prospectively examined the course of suicidal ideation as well as predictors and moderators of suicidal ideation during psychosocial treatments in older adults with major depression and dementia. This information may facilitate the development of new interventions to reduce suicidal ideation and improve patients and caregivers' quality of life.

The goal of this study is to examine the course of depression and suicidal ideation in 39 older adults with major depression and dementia during 12 weeks of home-delivered PATH and ST-CI. The sample of the study consists of patients with dementia who were a subgroup of the original sample of 74 older adults with major depression and a wide range of cognitive impairment, from mild cognitive deficits to moderate dementia [19]. We hypothesize that PATH participants will show greater reduction in depression and suicidal ideation than ST-CI participants over the course of 12-week acute treatment. Based on the literature of late-life depression and dementia, we will also explore the predicting or moderating effect of critical baseline variables (i.e. disability, cognitive impairment, anxiety, and social support) on the course of depression and suicidal ideation during the 12-week treatment.

MATERIALS AND METHODS

Participants

Thirty-nine older adults with major depression, mild or moderate dementia, and disability participated in an RCT that compared the efficacy of PATH versus ST-CI. The original whole sample was 74 older adults with MDD, cognitive impairment (from mild cognitive impairment to moderate dementia). The depression and disability outcomes of the whole sample have been reported elsewhere [19]; the present analysis focuses on the outcome of depression and suicidal ideation in the subgroup of patients with dementia. Participants were recruited through collaborating community agencies of the Weill Cornell Institute of Geriatric Psychiatry, located at a University Hospital in Westchester County, NY. The Cornell IRB approved study procedures.

In the original study, eligible participants were 65 years old or older and had a diagnosis of unipolar non-psychotic MDD by DSM-IV criteria, a Montgomery-Åsberg Depression Rating Scale (MADRS) total score ≥ 17 [24], cognitive impairment (up to the level of

moderate dementia) and disability (at least one impairment in activities of daily living). In this subsample analysis, we included 39 participants classified as having probable or definite dementia based on the DSM-IV criteria, including: a) progressive cognitive decline at least in the past 6 months as reported by patient and/or caregiver; and b) significant impairment in two DRS areas of cognitive functioning (scaled score ≤ 5). Participants were either: a) not taking any psychotropic drugs, including antidepressants, cholinesterase inhibitors, or memantine, or b) taking a stable dosage for at least 6 weeks prior to study entry with no medical recommendation for medication change in the next 3 months. Exclusion criteria included: (1) any other active Axis I psychiatric disorder (except anxiety disorders); (2) acute or severe medical illness during the three months prior to entry; or drugs known to cause depression; (3) current involvement in psychotherapy; (4) Mini-Mental State Examination (MMSE) score < 17 [25]; and (5) aphasia and inability to speak English.

Potential participants, with full capacity to consent (measured with Cornell Scale for Capacity to Consent) signed consent forms and were randomly assigned to home-delivered PATH or ST-CI. Research assistants were unaware of participants' randomization status and the study hypotheses.

Systematic Assessment

We assessed depression and suicidal ideation at entry (baseline), week 4, week 8, and week 12 with Total score and the Suicide Item (Item #16) of Cornell Scale for Depression in Dementia (CSDD) respectively [26]. Each item was scored on a scale of 0–2; 0=Absent; 1=Mild to Intermittent; 2=Severe. The scores for the Suicide Item were: 0=No suicidal ideation; 1=Passive suicidal ideation (e.g., life is not worth living, wish I were dead); and 2=Active suicide thoughts. Interviewers scored each CSDD item based on the patient and caregiver reports. We calculated depression severity excluding the suicide item by subtracting the CSDD-SI item from CSDD total (CSDD minus SI). Overall cognitive impairment, memory functioning and executive functions at baseline were assessed with the Mini Mental State Exam total [25], the Hopkins Verbal Learning Test-Revised [27] and the Stroop Color-Word test [28] respectively. Disability was evaluated with the 12-item interviewer-administered World Health Organization Disability Assessment Schedule II (WHODAS II)[29]. Finally, anxiety and social support were measured with the CSDD Anxiety item (Item #1) and the interviewer-rated Philadelphia Multiphasic Assessment Instrument Social Support Domain respectively [30]. The Social Support Domain scores ranged from 1–5, 1=No available support from family or friends; 2=Below average degree of social support; 3=About average degree of social support; 4=Above average degree of social support; and 5=high degree of social support.

Therapists were doctoral-level clinical psychologists, clinical social workers and a doctoral candidate in a clinical psychology program and were trained in both PATH and ST-CI. Therapists training is reported elsewhere and treatment fidelity scores are very good to excellent [19].

Interventions

The two home-delivered psychosocial interventions, PATH and ST-CI, have been described elsewhere [19]. Both psychosocial interventions are depression treatment, home-delivered, and administered weekly for 12 weeks. The goal of PATH is to improve emotion regulation (i.e. decrease negative emotions and increase positive emotions) in older adults with major depression and cognitive impairment. To achieve emotion regulation, PATH utilizes a problem-solving approach, employs compensatory strategies and environmental adaptation tools (e.g. calendar, notes, signs, and notebook) and incorporates caregiver participation. Because of increased caregiver burden, caregiver involvement in PATH is problem-specific and only if patients can not improve emotion regulation by themselves or with the use of environmental adaptations or compensatory strategies. Caregiver participation may help regulate patient's emotions through: a) helping the patient avoid negatively charged situations; b) participating in the problem-solving process, the use of environmental adaptation tools and compensatory strategies; and c) facilitating the patients' engagement in pleasurable activities. Caregiver involvement is more frequent in patients with significant cognitive, functional and physical limitations.

PATH therapist adjusts patient and caregiver strategies based on the specifics of the patient's problems and patient's cognitive and functional limitations. For example, if a moderately demented person has difficulty employing emotion regulation strategies, e.g. utilizing techniques to avoid negatively charged situations or to distract themselves from negative emotions, the caregiver may use these techniques to help improve patient's emotion regulation (e.g., remind patient to avoid negatively charged situations or help patient distract by encouraging the patient to engage in activities).

Whereas PATH is an active intervention consistent with the process model of emotion regulation, ST-CI is based on Carl Rogers' theory and focuses on the facilitation of expression of affect, understanding and empathy and does not utilize the main ingredients of other psychotherapies [i.e. Problem Solving Therapy (PST), Interpersonal Psychotherapy (IPT), or CBT (Cognitive Behavior Therapy)]. The Supportive Therapy manual is adapted for patients with dementia. Specifically, the therapist employs techniques to address patient's cognitive difficulties such as: repeating answers, reminding the questions, gently shifting the topic of the conversation, and initiating conversation through open-ended questions. Long periods of silence are discouraged as they may reinforce the sense of isolation that these patients experience in many aspects of their lives. Finally, caregivers may participate in the sessions if the patient agrees.

Data Analysis

All participants with CSDD scores at baseline were included in the analysis, following the intent-to-treat principle. We used Wilcoxon-Mann-Whitney test (continuous variables) and the Chi-square test or Fisher's exact (categorical variables) to test differences between PATH (N=21) and ST-CI participants (N=18) on demographics and baseline clinical variables (Table 1). To test whether PATH participants had greater reduction of depression or suicidal ideation over 12 weeks of treatment, we used a mixed-effects model for longitudinal data. These models included time-trend parameter(s), treatment group, and time-treatment

interaction. Prediction and moderation was assessed by checking the baseline variables and their interaction with treatment effects in the mixed-effects model described above. *Moderators* are baseline variables that had a significant interaction with treatment effect on the proposed outcome (depression or suicidal ideation); *predictors* are baseline variables that alone, but not their interaction with treatment, were significantly associated with the outcome. Therefore, predictors had the same effect in both treatments whereas moderators had differential effect in PATH vs. ST-CI. The predictor and moderator analyses were exploratory and significant effects will be used to guide the design of future studies. A two-tailed alpha level was used for each statistical test. All analyses were performed with SAS 9.2 [31].

RESULTS

Participant Baseline Characteristics

The 39 randomized participants (PATH=21; ST-CI=18) were aged 82.5 years (SD=7.16) and had approximate 12.6 years of education (SD=3.09). They had mild to moderate major depression (mean CSDD total=18.90; SD 3.03), cognitive impairment ranging from mild to moderate dementia (mean DRS total=112.66; SD=10.56) and pronounced disability (mean WHODAS-II total=34.03; SD=6.52) (Table 1). At study entry, approximately 36% had suicidal ideation, all of them mild (CSDD-SI=1). There was no significant difference in the prevalence of suicidal ideation between treatments (PATH vs. ST-CI=42.86% vs. 27.78%, fisher's exact=0.5043). Also, there were no significant differences in demographic and baseline characteristics between treatments except baseline HVLT immediate recall, i.e. PATH participants had significantly worse performance than ST-CI participants (Table 1). Of the 39 randomized participants, 33 (84.6%) completed the 12-week treatment trial. Among those who dropped out of treatment (N=6), 3 were receiving PATH and 3 ST-CI.

Depression

Course—PATH participants had significantly greater reduction in depression than ST-CI participants over the 12-week period (treatment group by time interaction: $F[1,95.9]=7.28$, $p=0.0082$; Cohen's d : week 12: 0.50 (Figure 1). Caregiver involvement (yes vs. no) and degree of dementia (mild vs. moderate) were not significantly associated with the course of depression.

Predictors—MMSE and Whodas-II Total: Baseline MMSE and Whodas-12 scores were not associated with different course of depression in both PATH and ST-CI participants.

Anxiety: Participants with lower baseline anxiety scores had greater reduction in depression over 12 weeks of treatment (CSDD Anxiety: $F[1,32.2]=5.45$, $p=0.0260$) in both treatments. There was no significant difference between PATH and ST-CI participants.

Moderator—PATH was associated with greater reduction of depression than ST-CI in patients with higher social support (i.e. higher MAI Social Support scores) (MAI Social Support $\times$ treatment interaction: $F[1,30.9]=5.12$, $p=0.0308$; MAI Social Support $\times$ treatment interaction $\times$ time: $F[1,32.2]=5.14$, $p=0.0303$) (Figure 2). There was no significant difference between PATH vs. ST-CI in patients with low social support.

Suicidal Ideation

Course—Participants in both PATH and ST-CI had significant reduction in suicidal ideation over 12-week period (time: $F[1,95.8]=10.06$, $p=0.0020$). However, there was no significant difference on the course of suicidal ideation between PATH and ST-CI (time by treatment interaction: $F[1,95.8]=0.75$, $p=0.3897$) [Raw Percentages (PATH vs. ST-CI): Baseline: 42.86% vs. 27.78%; Week 4: 15.78% vs. 18.75%; Week 8: 10.52% vs. 20%; Week 12: 10.53% vs. 6.66%] (Figure 3). Degree of dementia was not significantly associated with the course of suicidal ideation.

Predictors—MMSE Total, Whodas-II Total and Anxiety: Baseline MMSE, Whodas-12 and Cornell Anxiety scores were not associated with different courses of suicidal ideation in both PATH and ST-CI participants. Social Support: Participants with lower baseline MAI Social Support scores had greater reduction in suicidal ideation over 12 weeks of treatment than participants with higher baseline MAI Social Support (MAI SS: $F[1,97.9]=6$, $p=0.0160$) (Figure 4). There was no significant difference between PATH and ST-CI participants (i.e. social support did not moderate the effects of PATH vs. ST-CI).

Moderators—No variable moderated the effects of PATH vs. ST-CI on suicidal ideation.

DISCUSSION

The principal finding of the study is that PATH has greater efficacy in reducing depression than ST-CI over 12 weeks of treatment in older adults with major depression and dementia. This is the first study, to our knowledge, that examines the course of depression during home-delivered psychosocial treatments in this population. Our findings are clinically significant as psychosocial interventions for older adults with major depression and dementia are under-investigated and antidepressants have limited efficacy in this population.

PATH and ST-CI are manualized, home-delivered psychosocial interventions administered with high treatment fidelity [19]. These treatments focus on two different mechanisms of action: PATH aims to reduce depression by utilizing techniques to improve emotion regulation, whereas ST-CI focuses on empathy and understanding delivered in a supportive context. The PATH therapist, the patient, and, if necessary, the caregiver create a plan to promote patient's emotion regulation (i.e. decrease negative emotions and increase positive emotions) by using a hands-on problem-solving approach and employing environmental adaptations and compensatory strategies such as notes, calendars, and strategies to sustain or shift attention. Even though both treatments reduced depression, PATH participants had significantly greater reduction in depression than ST-CI participants (Cohen $D=0.50$). Our finding is consistent with the results of the whole sample [19], i.e. including patients with mild cognitive deficits, and suggests that this population needs a more specific psychosocial treatment than just a generic supportive intervention.

Research on suicide risk and behavior in demented patients is under-investigated. At study entry, more than 1/3 of our sample exhibited suicidal ideation, albeit mild and passive. Our findings reveal that both home-delivered psychotherapies had significant and comparable reduction in suicidal ideation over 12 weeks. Possible explanations for the lack of treatment

effect between PATH vs. ST-CI are: 1) The suicide item of CSDD (Score 0–2) is not a sensitive enough measure to capture varying degrees of suicidal ideation. Future investigations need to examine suicidal ideation with more sensitive suicide instruments. 2) PATH is not designed to reduce suicidal ideation but to reduce depression and disability in this population. Enhancing PATH with techniques to further reduce suicidal ideation and risk may result in a faster response, which may lead to significant treatment effects of PATH vs. ST-CI. 3) Participants in this study had mostly passive suicidal ideation. Potential participants with more severe suicidal ideation, eg, active thoughts of suicide, were excluded. Our results suggest that a good therapeutic relationship, which is promoted in both treatments, may be enough to reduce passive suicidal ideation in this population. Future investigations may focus on examining reduction in suicidal ideation in patients with more severe suicidal ideation or at higher risk for suicide. Nevertheless, reduction in suicidal ideation, even in mild forms, is clinically important because suicidal ideation is associated with non-suicide mortality^[32,33] and compromised quality of life for patients and their families^[34–35].

Baseline social support had a significant effect on the course of depression. Patients with high social support had greater reduction in depression in both treatments than those with low social support. Considering that current treatments are ineffective for patients with low social support, future investigations need to focus on how to help these patients by identifying predictors, moderators and mediators of treatment outcomes in this vulnerable group. PATH participants with high social support had the greatest reduction in depression, when compared to PATH participants with low social support and ST-CI participants with high and low social support. PATH may facilitate the reduction in depression in patients with high social support by: a) increasing positive emotions through patient's engagement in pleasurable and rewarding activities with family and friends; and b) incorporating techniques to improve the relationship between patients and family members or caregivers [19]. Since the involvement of family members and caregivers is crucial in the lives of these patients, PATH techniques may help reduce the depression even further in this subgroup.

Participants with low social support had higher rate of baseline suicidal ideation and greater decline over 12 weeks than participants with high social support. This is consistent with findings demonstrating that depression and low social support are associated with suicidal ideation and suicide risk in older adults [36, 37, 38]. The effect of both treatments on reducing suicidal ideation in patients with low social support compared to patients with high social support may reflect a floor effect as rates of suicidal ideation were lower in participants with high social support. Future studies may further examine the relationship of depression, social support and suicide ideation in older adults with dementia.

Older adults with major depression in the context of dementia may be a heterogeneous group, including patients with a history of major depression that developed dementia or patients whose major depression may be a prodromal symptom of dementia. Nevertheless, there is a strong association and considerable overlap between major depression and cognitive impairment [39, 40]. Cognitive impairment may contribute to depression and major depression is a risk factor of progression to dementia in cognitively impaired older adults [41]. We selected Cornell Scale for Depression in Dementia as our depression

outcome measure because it evaluates depression in the context of dementia without emphasizing cognitive and somatic symptoms, which are associated with dementia [39]. Our study participants do not have “pure” mood or cognitive disorder, but suffer from both major depression and dementia. To address the needs of this group, PATH focuses on both depression and dementia; its techniques directly address depression (e.g. hopelessness, worthlessness, guilt) while providing environmental adaptations and compensatory strategies to bypass cognitive limitations (e.g., attention and memory deficits, executive dysfunction).

Strengths of the study include: 1) comparison of well-validated, manualized, distinct psychotherapies with monitoring of fidelity to intervention and ongoing supervision to ensure fidelity; 2) standardized assessments of mood, suicidality, and dementia diagnosis; and 3) high participant adherence to treatment intervention (>96% of planned therapy visits until the end of treatment or end of participation). Despite the study’s promising findings, the study has several limitations. First, the sample was a subgroup of an RCT in a group of older adults, with broader cognitive impairment (including both patients with mild cognitive deficits and dementia). Also, the study sample is small and the results need to be replicated in a larger study. Second, the study was not originally designed to study the course of suicidal ideation, which is admittedly a secondary outcome. Therefore, we did not use a specific instrument to measure suicidal ideation, risk or behavior. We based our results on the Suicide Item of the Cornell Scale for Depression in Dementia. Future studies need to focus on examining suicidal ideation with a more sensitive instrument. Nevertheless, our study fills a gap in the sparse literature on suicidal ideation in older adults with dementia. Third, the limited sample size in the demented cohort was not powered to examine predictors, moderators and mediators intervention effect. Therefore, the effect of baseline social support may need to be replicated in an adequately powered study.

In conclusion, PATH participants had significantly greater reduction than ST-CI participants in depression in older adults with major depression and dementia. Our finding is consistent with the finding of our original study in the whole sample of older adults with wide range of cognitive deficits. The study also demonstrated the effectiveness of well-validated, manualized, home-based psychotherapies in reducing depressive symptomology in depressed older adults with dementia. Furthermore, both treatments reduced suicidal ideation in this population. The latter has significant public health implications as suicidal ideation is a risk factor for attempted and completed suicides, non-suicide mortality, and poor quality of life for patients and caregivers.

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Figure 1.

The Course of Depression During 12 Weeks of PATH vs. ST-CI in 39 Older Adults with Major Depression and Dementia

Depression scores over 12 weeks of PATH versus ST-CI in 39 elders with major depression, and dementia based on the least squares means and standard error of the mixed effects model: time + treatment + treatment $\times$ time.

Figure 2.
Effect of Baseline Social Support on the Course of Depression During 12 Weeks of PATH vs. ST-CI in 39 Older Adults with Major Depression and Dementia
Depression scores over 12 weeks of PATH versus ST-CI in 39 elders with major depression, and dementia for Low (MAI Social Support=2; Below Average Social Support) and High (MAI Social Support=5; High Degree of Social Support) Social Support Groups.

Figure 3.
Probability of Suicidal Ideation During 12 Weeks of PATH vs. ST-CI in 39 Older Adults with Major Depression and Dementia
Predicted Probability of Suicidal Ideation over 12 weeks of PATH versus ST-CI in 39 elders with Major Depression and Dementia.

Figure 4.
Effect of Baseline Social Support on the Probability of Suicidal Ideation During 12 Weeks of PATH vs. ST-CI in 39 Older Adults with Major Depression and Dementia
Predicted Probability of Suicidal Ideation over 12 weeks of Low vs. High Social Support Groups in 39 elders with Major Depression and Dementia.

Table 1
Demographic and Clinical Characteristics of 39 Older Adults with Major Depression and Dementia

	PATH (N=21)		ST (N=18)		Fisher's	
	N	Perc (%)	N	Perc (%)		
Gender					0.71	
Female	17	80.95	13	72.22		
<u>Race and Ethnicity</u>					1.00	
Caucasian	17	80.95	14	77.78		
African-American	4	19.05	4	22.22		
Hispanic (all Caucasian)	3	14.29	0	0.00	0.24	
Dementia					0.74	
Mild	12	57.14	12	66.67		
Moderate	9	42.86	6	33.33		
On Antidepressants	14	66.67	12	66.67	1.00	
Drug Treatment Resistant	7	33.33	6	33.33	1.00	
Number of Depression Episodes (>=3)	9	45.00	8	47.06	1.00	
Any Anxiety Disorders	7	33.33	5	27.78	0.74	
On Cognitive Enhancers	3	14.29	5	27.78	0.43	
Mann-Whitney Wilcoxon						
	Mean	SD	Mean	SD	z	p
Age	83.14	6.26	81.65	8.26	-0.19	0.85
Age at Onset of Depression	55.71	29.47	69.59	20.66	1.39	0.16
Education (years)	12	3.41	13.41	2.55	1.13	0.26
CSDD Total ¹	19.5	3.36	18.22	2.53	-0.90	0.37
CSDD Suicidal Ideation ¹	0.43	0.51	0.28	0.46	-0.95	0.34
CSDD Anxiety ¹	1.48	0.51	1.44	0.51	-0.18	0.86
WHODAS-12 Total ²	35.33	7.02	32.5	5.68	-1.44	0.15
MMSE Total ³	25.28	3.46	24.94	2.95	-0.70	0.48
Stroop CW ⁴	12.57	8.17	16.62	5.45	1.09	0.27

	PATH (N=21)		ST (N=18)		Fisher's	
	N	Perc (%)	N	Perc (%)		
HVLT ⁵						
Immediate Recall	2.3	1.72	3.39	1.24	2.08	0.04
Delayed Recall	2.45	1.88	3.22	2.44	0.95	0.34
MAI Social Support ⁶	4.33	0.91	3.83	1.04	-1.58	0.11
Charlson Total ⁷	3.14	2.5	3.56	2.91	0.16	0.88
Intensity of Antidepressant Medication Treatment ⁸	1.6	1.35	1.88	1.41	0.59	0.56

[#] 90.5% of subjects who completed the study had 12 therapy sessions, 6.3% had 11 sessions, and 3.2% had 10 session.

^a Mild Dementia as defined by DRS Total Scaled Score >3 and <=5 after adjusting for age and education (DRS 2 Manual); Moderate Dementia as defined by DRS Total Scaled Score <=3 after adjusting for age and education;

¹ Cornell Scale for Depression in Dementia (CSDDD);

² World Health Organization Disability Assessment Schedule – II - 12 items;

³ Mini Mental State Exam - Total;

⁴ Stroop Color-Word Score;

⁵ Hopkins Verbal Learning Test – Revised;

⁶ Philadelphia Multiphasic Assessment Instrument – Social Support – Total;

⁷ Charlson Comorbidity Index;

⁸ Composite Antidepressant Score (CAD) – Revised.