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Comparative effectiveness of 2 interventions for Hispanic caregivers of persons with dementia

José A. Luchsinger, MD, MPH^{1,2}, Louis Burgio, PhD³, Mary Mittelman, DrPH⁴, Ilana Dunner, LMSW⁵, Jed A. Levine, MA⁶, Carolina Hoyos, LMSW⁷, Dante Tipiani, MSW¹, Yefrenia Henriquez, CHES¹, Jian Kong, MS^{8,9}, Stephanie Silver, MPH^{8,9}, Mildred Ramirez, PhD^{8,9}, and Jeanne A. Teresi, PhD, EdD.^{8,9,10}

¹Department of Medicine, Columbia University Medical Center, New York, NY

²Department of Epidemiology, Columbia University Medical Center, New York, NY

³Burgio Geriatric Consulting, Tuscaloosa, AL

⁴Departments of Psychiatry and Rehabilitation Medicine, New York University School of Medicine, New York, NY

⁵Riverstone Senior Life Services, New York, NY

⁶CaringKind, New York, NY

⁷New York City Department for the Aging, New York, NY

⁸Hebrew Home at Riverdale, Research Division, New York, NY

⁹Weill Cornell Medical College, New York, NY

¹⁰Columbia University Stroud Center at New York State Psychiatric Institute, New York, NY

Abstract

Objective—There are no data comparing the effectiveness of counseling interventions for caregivers of persons with dementia. We compared for the first time the effectiveness of two caregiver interventions with known efficacy, the Resources for Enhancing Caregiver Health-Offering Useful Treatment (REACH-OUT), and the New York University Caregiver Intervention (NYUCI).

Design—1:1 randomized pragmatic trial

Setting—New York City.

Participants—221 informal Hispanic caregivers of persons with dementia.

Intervention—Participants were randomized to 6 months of NYUCI or REACH-OUT. All participants were referred for social supportive services.

Measurements—The primary outcomes were changes between baseline and 6 months in depressive symptoms, measured with the Geriatric Depression Scale (GDS), and caregiver burden, measured with the Zarit Caregiver Burden Scale (ZCBS).

Results—The mean age was 58.2 years, 82.8% were women, 63.3% were adult children, and 31.7% were spouses; 110 were randomized to the NYUCI, and 111 to REACH-OUT. The groups were balanced on characteristics at baseline. There were no differences in outcomes between NYUCI and REACH-OUT. Both interventions showed a reduction in burden (REACH-OUT = 5.2 points, 95 % confidence interval [CI] = 2.2, 8.1, $p < 0.001$; NYUCI = 4.6-points, 95% CI: 1.7, 7.5, $p = 0.002$). There were no significant changes in the GDS. Effects for the ZCBS were significant only among spouses and older caregivers.

Conclusions—Although there were no significant intervention group differences, both interventions resulted in significantly reduced burden among Hispanic caregivers at 6 months, particularly among spouse and older caregivers, as contrasted with other subgroups.

Keywords

Alzheimer; dementia; clinical trials; minority aging; caregiver

INTRODUCTION

In 2017, the Alzheimer's Association estimated that 5.5 million people have dementia, cared for by more than 15 million unpaid caregivers resulting in \$230 billion in annual costs.¹ Dementia prevalence in Hispanics, the fastest growing group of persons over 65 years of age in the United States (US), is higher than in Non-Hispanic Whites.²⁻⁴ There may be a higher burden of dementia caregiving for Hispanic families. This is partly due to reluctance to defer caregiving responsibilities, consistent with the concept of familism, important in Hispanics.⁵ Familism emphasizes the family as responsible for caregiving responsibilities.⁵ This may be compounded by lower socioeconomic status and access to resources.^{2,5} However, few studies have tested the effectiveness of caregiver interventions among Hispanics.

Two of the best-known caregiver interventions are the New York University Caregiver Intervention (NYUCI),⁶⁻⁸ and the Resources for Enhancing Caregivers Health (REACH).⁹ The NYUCI demonstrated efficacy in White spouse caregivers,⁶⁻⁸ and more recently, in White adult children caregivers in Minnesota.¹⁰ REACH demonstrated efficacy among Whites, Blacks, and Hispanics from South Florida and California.⁹ The less intensive Offering Useful Treatment (REACH-OUT) adaptation has been implemented in several populations. However, the effectiveness of the NYUCI and REACH-OUT has never been compared. We compared the effectiveness of the NYUCI and REACH-OUT, in alleviating depressive symptoms and caregiver burden during a 6-month period, in 221 Hispanic caregivers in New York City. The NYUCI emphasizes strengthening social support for the primary caregiver from family and friends, while the REACH-OUT emphasizes skills-building in the primary caregiver. Since familism is reportedly very important in Hispanics,⁵ we hypothesized that depressive symptoms and caregiver burden would improve more or deteriorate less in caregivers receiving the NYUCI as compared with REACH-OUT.

METHODS

The study was approved by the Columbia University Medical Center (CUMC) Institutional Review Board and registered in clinicaltrials.gov (NCT0209298). The methods are described elsewhere.¹¹ Briefly, the Northern-Manhattan Hispanic Caregiver-intervention Effectiveness study (NHICE) was a pragmatic randomized clinical trial,^{12,13} comparing the NYUCI and REACH-OUT.¹⁴ Randomization was performed using a 1:1 allocation at the individual level. A sample size of 200 (100 per arm) was estimated to detect a moderate difference (Cohen D = 0.5) between the arms for two co-primary outcomes assuming power of 0.80 and a two-tailed alpha of 0.05. This was a conservative estimate; power calculations performed in sensitivity analyses showed a detectable effect size of 0.33 to 0.50. The interventions lasted 6 months. There were two evaluations, baseline and follow-up, which were carried out by a research coordinator who was independent of the interventionists.

The study was based at CUMC. Our stakeholder partner, the New York City Chapter of the Alzheimer's Association, renamed CaringKind in 2016, assisted with study dissemination and participant recruitment. Our other stakeholder partner, Riverstone Senior Life Services, provided supportive social work services for all participants and helped with dissemination and recruitment.

Participants—The sampling frame was the population of adult Hispanic informal caregivers of persons with dementia in New York City (NYC). The inclusion criteria were: self-identified Hispanic; ages 18 to 90 years; related to care recipient as spouse, former spouse, common law partner, blood or in-law relative; care recipient with dementia diagnosis, at least 1 memory/cognition and 1 daily functioning symptom; caregiver physically able to provide care, expected to live in NYC for the study duration, with at least one relative or friend living in the NYC Metropolitan Area (New York, New Jersey, Connecticut) who could participate in family sessions. Exclusion criteria included major psychiatric disorder (e.g. schizophrenia), and depression with psychotic features or suicidal ideation in the previous 5 years.

Interventions—The 2 interventions compared, the NYUCI and REACH-OUT, have similarities: 1) they are both based on the Pearlin's stress process model (SPM);¹⁵ 2) are designed to ameliorate caregiver depression and subjective burden; 3) involve direct interaction between the interventionist and the caregiver/family; 4) focus on similar skills/topics; and 5) allow tailoring to the caregiver/family. However, they differ on 2 potent factors in interventions: therapeutic technique and mode of delivery.¹⁶ Duration and "dosing" of both interventions were similar, 6 planned visits in 6 months of similar duration and ad-hoc contacts. The interventions were delivered by dedicated counselors with similar qualifications (masters-prepared social workers), fluent in English and Spanish. All pertinent study materials were available in English and Spanish.

The first component of the NYUCI requires 2 individual and 4 family counseling sessions with relatives or friends of the caregiver. Session content is guided by the needs of each caregiver and other participating family members (e.g., promoting communication among relatives, learning techniques for management of troublesome behavior). These sessions last

between one and 1.5 hours. The second component of the NYUCI is the recommendation to join a support group for emotional support and education. The third component is “ad-hoc” counseling—the continuous availability of the counselor to help caregivers and families deal with crises and changes in dementia symptoms.

REACH-OUT involves engaging the primary caregiver in joint problem-solving to create written action plans targeting specific problems (e.g., improving caregiver health, care recipient problem behaviors). The primary caregiver is asked to share REACH-OUT skills with family members; however, family participation is not required as for the NYUCI. The first step in REACH-OUT is a risk appraisal to determine the emphasis of the intervention components, which consist of 6 specific skill sets taught to caregivers: 1) Education about dementia, caregiving, and stress; 2) helping the caregiver stay healthy; 3) keeping the home safe for the patient with dementia; 4) teaching the caregiver to maintain emotional wellbeing through relaxation; 5) behavior management; and 6) enhancing social support.

All participants were offered referral for supportive services not covered by the interventions at Riverstone Senior Life Services. If participants accepted, a case worker conducted an intake evaluation and customized supportive services for each individual (e.g. medical insurance, housing, home aide services).

Outcome measures—The primary outcome measures were caregiver burden, measured with the Zarit Caregiver Burden Scale (ZCBS),¹⁷ and depressive symptoms, measured with the Geriatric Depression Scale (GDS).¹⁸ The ZCBS consists of 22 items such as “Do you feel embarrassed by his/her behavior?”. Items were rated on a 5-point Likert scale ranging from “Never” to “Nearly Always”. The GDS consists of 30 yes/no items measuring depression such as “Do you feel happy most of the time?”. We selected the GDS as the primary measure of depression based on its use in previous NYUCI studies, and our review of the literature¹⁹ that suggested that the GDS has less differential item functioning (DIF) items biased for ethnically diverse groups as compared with other measures, such as the Epidemiologic Studies Depression Scale (CES-D).²⁰

Covariates—In addition to demographics, we measured potential confounders including dementia severity, caregiver co-morbidity, and caregiver acculturation. The dementia severity measure was the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE).²¹ The measure of caregiver co-morbidity was the Charlson Comorbidity Index.²² The measure of acculturation was the Bi-dimensional Acculturation Scale.²³ Participants were defined as “bicultural” or not using the algorithm of the Marín Bicultural Acculturation Scale for Hispanics.²³

Statistical Analyses

Analyses were performed on an intent-to-treat basis—Two primary outcomes were pre-specified and the p value was set at 0.05 for a two-tailed test. The primary analyses were conducted using repeated measures mixed models with SAS Proc Mixed to examine differences between the groups. An unstructured covariance structure was used in all analyses. Group and residual variances did not require modeling. Administration was used as the indicator for study wave interval. However, actual time (in months) was used in

sensitivity analyses. Sensitivity analyses were also performed using an analysis of covariance (ANCOVA) approach, in which the follow-up value was the outcome, adjusted by the baseline and group status variables.

Subgroup analyses were performed for age, family position, acculturation, and satisfaction with social support. Low proportion of men (17%), precluded analyses stratified by sex. Age subgroups were defined by the median (57 years, 58 years and older). Because 95% of caregivers were spouses or children of the care recipient, these two groups were evaluated. Groups by satisfaction with social support at baseline were defined based on equal distribution of those who were “very satisfied” with their social support network (49%) vs. the remainder of the categories (“moderately satisfied”, “slightly satisfied”, “slightly dissatisfied”, “moderately dissatisfied” and “very dissatisfied”); defined as “not very satisfied”.

Both intervention groups were assessed in terms of the number of intervention contacts. Dose-response (analysis not shown) was examined using a linear mixed model entering number of contacts and the interaction of intervention group status by number of contacts.

RESULTS

Recruitment began on 03/01/2014 and ended on 02/29/2016 (24 months). Our original recruitment target was 200 and our target date to end recruitment was 02/29/2016. We achieved our recruitment target on 12/31/2015, but continued recruitment until the 02/29/2016, reaching a sample size of 221, with permission from the funding agency and the data safety and monitoring board. Data collection was completed on 09/30/2016. Nearly 60% of all potential participants were enrolled. The follow-up response rate was 95.5% (210 out of 221 participants; See Figure 1, Consort Statement). There were no adverse events related to the study procedures.

All participants were Hispanic; 32.6% were of Dominican origin, 12.7% Puerto Rican, 17.2% South American, and 27.1% reported their Hispanic subgroup as “other Hispanic” (Table 1). The average age of the caregiver was 58.2 years (s.d.=11.2) and over 80% were women. The majority (63%) of caregivers were adult children, and about one-third were spouses. The majority of caregivers (74%) lived with the care recipient. The average education of the caregivers was 12.8 (s.d.=3.6) years. About 40% were employed full or part-time. Approximately half of the sample was married. The average age of the care recipient was 79.6 years (s.d. = 9.2), the majority (62%) were women, and 78% were diagnosed with dementia due to Alzheimer’s Disease (Table 2).

Table 3 shows baseline and follow-up outcome values. The primary analyses evidenced no significant differences between the interventions at baseline and six-month follow-up for the ZCBS and GDS. However, significant reduction in burden was observed for both study arms. There was a decrease in the ZCBS for both REACH-OUT and NYUCI; 5.2 points (95% confidence interval [CI]: 2.2, 8.1; $p < 0.001$) for REACH-OUT and a 4.6-points (95% CI: 1.7, 7.5; $p=0.002$) for NYUCI. For the GDS, there was no significant change for REACH-OUT and NYUCI.

Table 4 shows the subgroup analyses. The effects on the ZCBS were statistically significant among caregivers 58 years of age and older (6.59 points, $p=0.001$ for REACH-OUT, and 7.20, $p=0.001$ for NYUCI), but not statistically significant among younger caregivers (3.58 points, $p=0.098$ for REACH-OUT, and 2.30, $p=0.25$ for NYUCI). The effects on the ZCBS were statistically significant among spouse caregivers (8.0 points, $p=0.005$ for REACH-OUT and 9.4, $p=0.001$ for NYUCI) but not among children (3.2 points, $p=0.08$ for REACH and 2.1, $p=0.22$ for NYUCI). The majority of spouses (82.9%) were 58 years or older and the majority of adult children (63.6%) were 57 years old or younger. The effects of the ZCBS were statistically significant both among caregivers who were bicultural (6.9 points, $P=0.004$ for REACH-OUT and 5.7, $P=0.02$ for NYUCI) and among those not bicultural (4.7 points, $P=0.04$ for REACH-OUT and 5.5, $P=0.02$ for NYUCI). The effects of the ZCBS were statistically significant among caregivers who were very satisfied with their social support network at baseline (6.2 points, $P=0.01$ for REACH and 5.4, $P=0.02$ for NYUCI) but were not significant among those not very satisfied (3.3 points, $P=0.14$ for REACH and 2.4, $P=0.29$ for NYUCI). Examination of the GDS within age, relationship, and satisfaction with social support subgroups did not reveal any statistically significant results.

The majority of participants (79.3%) completed 4, 5, or 6 sessions (80.1% for REACH-OUT, 78.5% for NYUCI). The REACH-OUT had an average of 5.0 visits (s.d. = 1.6), with a median of six visits. The NYUCI had an average of 4.5 visits (s.d. = 1.4) with a median of five visits. Thus, there was little variation in the dose response variable. Examination of the dose response with the outcomes yielded no significant effects (p values ranged from 0.13 to 0.88). In terms of ad-hoc calls, the REACH-OUT group had significantly more participants with ad-hoc calls ($n=26$, 23.4%) than the NYUCI group ($n=9$, 8.2%; $p=0.002$). The difference in ad-hoc calls between the groups had no effect on the primary outcomes analyses (ZCBS $p=0.49$; GDS $p=0.40$; differences are for change in ZCBS and GDS between intervention arms).

We examined the differences in contact with social worker support delivered at Riverstone Senior Life Services between the groups. The REACH-OUT group had significantly more participants with social worker contact ($n=48$, 43.2%) than the NYUCI group ($n=23$, 20.9%; $p<0.001$). However, the number of contacts did not affect the effect of the interventions on the primary outcomes (ZCBS $p=0.45$; GDS $p=0.67$).

Sensitivity analyses using an analysis of covariance (ANCOVA) approach, using the follow-up outcome value as the outcome, and adjusted by the baseline and group status variables, yielded similar results as in the main pre-specified analysis.

DISCUSSION

Over the past three decades, many caregiver interventions have been developed to help people with Alzheimer's or other dementias and their family caregivers. In an influential white paper, commissioned by the Administration on Aging²⁴, 44 of these treatments and care practices were reported to have shown positive outcomes in randomized controlled trials. However, since 2002, only ten evidence-based treatments and care practices have been further tested in translation studies conducted in the United States.

Two of the best-known and tested dementia caregiver interventions are the NYUCI⁶⁻⁸ and REACH.^{9,10} However, the acceptability and effectiveness of these interventions had heretofore never been compared. NHiCE is the first large pragmatic randomized trial to compare the effectiveness of two caregiver interventions. Before NHiCE, there were only two early small-scale attempts examining the comparative effectiveness of psychosocial interventions (not NYUCI and REACH-OUT) to improve the mental health of caregivers^{25,26}. We focused on Hispanics because they have a higher risk of dementia and its related caregiving burden,¹ there is little information on the effectiveness of these interventions in Hispanics, and Hispanics are the predominant ethnic group in the catchment area of CUMC.

Contrary to our hypothesis that NYUCI would be more effective than REACH-OUT, NHiCE demonstrated that there were no significant differences between the groups on the primary outcomes. Examination of within group differences showed that both groups experienced significantly reduced burden, particularly among spouse and older caregivers, as contrasted with other subgroups. These results are consonant with previous studies of the REACH,⁹ which also showed greater effectiveness for spouse caregivers. The NYUCI demonstrated efficacy mostly in White spouse caregivers,⁶⁻⁸ and only recently in White adult children caregivers in Minnesota.¹⁰

Despite the differences in mode of delivery and therapeutic technique, we found that both were effective in decreasing caregiver burden. Our subgroup analyses, limited by relatively small strata, did not suggest that one intervention was better than the other in any subgroup. However, they suggested that both interventions seem to be more effective in certain subgroups. The strongest subgroup difference was for spouse vs. adult child caregivers. We found that spouse caregivers benefited substantially more from both interventions in the reduction of caregiver burden compared with adult caregivers. We can only speculate about the potential reasons for this difference. It may be that caregiver burden for spouses is more related to the direct effects of dementia on their relationships and lifestyles, and therefore amenable to change, while the burden for adult child caregivers is added to other obligations, such as taking care of young children and concern about jobs, which are less amenable to modification thorough counseling, regardless of the intervention. We also found that older caregivers benefited more than younger caregivers, and this observation is likely tied to family position. Persons with more satisfaction with social support networks at baseline had a greater decrease in burden compared with those with lower satisfaction. This may be due to the fact that both interventions serve to leverage and improve social support, although the NYUCI theoretically depends more on this aspect than REACH-OUT, and caregivers with better social support at baseline are better able to take advantage of this aspect of the interventions. Our finding that the improvement in burden was similar among bicultural and non-bicultural Hispanics suggests that our findings may be generalizable to the general US population of caregivers.

The study has several limitations. It was powered to detect large effects in subgroup analyses and we may have missed smaller differences. The duration of follow-up was relatively short which could explain the null findings for depressive symptoms. In a study of the NYUCI the beneficial effects on depressive symptoms became apparent after 10 months.²⁷ Anxiety was not measured. We learned from participants that anxiety may be the most important mental

health construct to measure and target for intervention. A relative limitation is the lack of a control arm without intervention. However, NHiCE's goal was to test the comparative effectiveness of NYUCI and REACH-OUT.

NHiCE demonstrated that NYUCI and REACH-OUT were similarly effective in decreasing caregiver burden among Hispanic dementia caregivers, particularly caregivers who were older, were spouses rather than adult children, and were highly satisfied with their social support. These findings underscore the need for future research to develop and test caregiver interventions that target different sociodemographic groups with appropriate statistical power. Ideally, studies with a duration of more than 6 months should be conducted. Our findings need to be replicated in larger studies and in other sociodemographic settings. The main implication of our findings for caregivers and service providers is that both NYUCI and REACH-OUT were similarly effective in decreasing burden at 6 months. Thus, caregivers and service providers may choose NYUCI or REACH-OUT based on preference and practical considerations rather than considerations about differential effectiveness.

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- **Author Contributions:** all listed authors have contributed significantly to the work that has led to this manuscript. J.A Luchsinger was primarily responsible for study design, funding, supervising the conduct of the study, interpretation of results, and drafting of the manuscript. L. Burgio and M. Mittelman were responsible for study design, training the study supervising the delivery of interventions, and drafting of the manuscript. I. Dunner was responsible for the delivery of the support intervention for all participants. J.A. Levine was responsible for study outreach and recruitment. C. Hoyos and D. Tipiani were responsible for the delivery of the interventions. Y. Henriquez was primarily responsible for data collection. Jian Kong, Stephanie Silver, M. Ramirez, and J.A. Teresi were responsible for study design, data management, and statistical analyses. All authors contributed to the drafting of the manuscript.
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IMPACT STATEMENT

We certify that this work is novel. This is the first ever report of a pragmatic randomized clinical trial comparing the effectiveness of two interventions for caregivers of persons with dementia.

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Figure 1.
Consort statement figure. The Northern-Manhattan Hispanic Caregiver-intervention Effectiveness study (NHICE)

Table 1

Characteristics of caregivers for the total sample and by intervention: REACH-OUT and NYUCI. Continuous variables are presented as means (standard deviations [SD]). Categorical variables are presented as numbers (%)

		Total sample	REACH-OUT	NYUCI
Number of participants		221	111	110
Age in years, mean (SD)		58.24 (11.24)	58.33 (11.26)	58.15 (11.28)
Women (%)		183 (82.8)	91 (82.0)	92 (83.6)
Relationship to care receiver (%)	Adult Child	140 (63.3)	66 (59.5)	74 (67.3)
	Spouse	70 (31.7)	36 (32.4)	34 (30.9)
	Other	11 (4.9)	9 (8.1)	2 (1.8)
English language (vs. Spanish) (%)		81 (36.7)	37 (33.3)	44 (40.0)
Born in the United States (%)		54 (24.4)	20 (18.0)	34 (30.9)
Race (%)	White	41 (18.6)	18 (16.2)	23 (20.9)
	Black	6 (2.7)	2 (1.8)	4 (3.6)
	Other	174 (79.7)	91 (82.0)	83 (75.4)
Marital status	Married	110 (49.8)	55 (49.5)	55 (50.0)
	Single	52 (23.5)	24 (21.6)	28 (25.5)
	Divorced	34 (15.4)	14 (12.6)	20 (18.2)
	Separated	14 (6.3)	10 (9.0)	4 (3.6)
	Widowed	4 (1.8)	3 (2.7)	1 (0.9)
Education in years, mean (SD)		12.82 (3.61)	12.90 (3.48)	12.73 (3.74)
Employment (%)	Full time	64 (29.0)	31 (27.9)	33 (30.0)
	Retired	61 (27.6)	31 (27.9)	30 (27.3)
	Part-time	22 (10.0)	10 (9.0)	12 (10.9)
	Homemaker	17 (7.7)	8 (7.2)	9 (8.2)
	Unemployed	32 (14.5)	16 (14.4)	16 (14.5)
	Disabled	19 (8.6)	11 (9.9)	8 (7.3)
	Student	2 (0.9)	1 (0.9)	1 (0.9)
Household monthly income in \$ mean (SD)		2677.72 (3644.72)	2575.78 (2068.50)	2771.34 (4654.57)
Taking psychiatric medications (%)		20 (9.0)	13 (11.7)	7 (6.4)
Satisfaction with social support mean (SD) [Range 1 to 6]		5.10 (1.06)	5.15 (.98)	5.05 (1.14)
Charlson Comorbidity index mean (SD) [Range 0 to 25]		1.02 (1.32)	1.10 (1.39)	.95 (1.24)
Acculturation (Hispanic Domain), mean (SD) [Range 1 to 4]		1.57 (.66)	1.54 (.61)	1.61 (.71)

REACH-OUT: Resources for Enhancing Alzheimer's Caregiver Health-Offering Useful treatment; NYUCI: New York University Caregiver Intervention; SD: standard deviation.

Table 2

Characteristics of care recipients for the total sample and by intervention: REACH-OUT and NYUCI. Continuous variables are presented as means (standard deviations [SD]). Categorical variables are presented as numbers (%)

	Total sample	REACH-OUT	NYUCI
Number of participants	221	111	110
Age in years, mean (SD)	79.60 (9.18)	79.44 (8.25)	79.76 (10.07)
Women (%)	137 (62.0)	67 (60.4)	70 (63.6)
Dementia type (%)			
Alzheimer's	167 (75.6)	86 (77.5)	81 (73.6)
Vascular	16 (7.2)	8 (7.2)	8 (7.3)
Mixed	3 (1.4)	1 (0.9)	2 (1.8)
Other	35 (15.8)	16 (14.4)	19 (17.3)
IQCODE mean (SD) [Range 1 to 80]	4.76 (.43)	4.76 (.49)	4.77 (.35)

REACH-OUT: Resources for Enhancing Alzheimer's Caregiver Health-Offering Useful treatment; NYUCI: New York University Caregiver Intervention; SD: standard deviation; IQCODE: Informant Questionnaire of Cognitive Decline in the Elderly.

Table 3

Primary outcome variables at baseline and follow-up and results of repeated measures mixed models using an unstructured covariance structure.

	ZCBS [Range 0 to 88]			GDS [Range 0 to 30]		
Baseline and follow-up values by intervention arm						
	N	Mean	SD	N	Mean	SD
REACH-OUT group, mean (SD)						
Baseline	111	40.32	(18.44)	111	9.83	(7.33)
Follow-up	100	35.46	(18.04)	103	9.80	(7.25)
NYUCI group, mean (SD)						
Baseline	110	40.95	(16.67)	110	9.73	(6.55)
Follow-up	101	36.24	(15.88)	108	9.57	(7.12)
Results of repeated measures mixed models						
	Estimate	SE	p	Estimate	SE	p
Intercept	40.3153	1.6692	<0.0001	9.8288	0.6598	<0.0001
Intervention group	0.6392	2.3659	0.7873	-0.1016	0.9352	0.9136
Assessment	-5.1788	1.4819	0.0006	-0.0300	0.5068	0.9529
Interaction term	0.6021	2.0925	0.7738	-0.1621	0.7093	0.8194

REACH-OUT: Resources for Enhancing Alzheimer's Caregiver Health-Offering Useful treatment; NYUCI: New York University Caregiver Intervention; ZCBS: Zarit Caregiver Burden Scale; GDS: Geriatric Depression Scale; N: number

SD: standard deviation; SE: standard error; p: p value.

Table 4

Intervention group differences in the primary outcomes by subgroups: Age, relation of caregiver and care recipient, acculturation, and satisfaction with social networks.

Subgroup	ZCBS				GDS			
	N	Diff	SE	P	N	Diff	SE	P
Age of caregiver								
>57	REACH-OUT	60	6.5869	2.0260	0.0013	60	-0.0710	0.6963
	NYUCI	52	7.1978	2.1750	0.0011	52	0.0739	0.7319
57	REACH-OUT	51	3.5815	2.1602	0.0987	51	0.1459	0.7462
	NYUCI	58	2.2971	2.0025	0.2526	58	0.2931	0.6808
Relation of caregiver to care recipient								
Spouse	REACH-OUT	36	8.0043	2.7992	0.0047	36	0.3373	0.8728
	NYUCI	34	9.4359	2.8102	0.0010	34	-0.2980	0.8871
Child	REACH-OUT	66	3.2270	1.8112	0.0765	66	-0.7032	0.6559
	NYUCI	74	2.1096	1.7005	0.2163	74	0.2658	0.5969
Acculturation of caregiver								
Bicultural	REACH-OUT	43	6.9011	2.3806	0.0042	43	-0.1308	0.8466
	NYUCI	42	5.7400	2.4355	0.0195	42	0.4524	0.8297
Not bicultural	REACH-OUT	49	4.6463	2.2617	0.0414	49	0.6916	0.7976
	NYUCI	47	5.4968	2.2713	0.0165	47	0.4143	0.7995
Caregiver satisfaction with social networks								
Very satisfied	REACH-OUT	53	6.1589	2.3827	0.0104	53	-0.5294	0.8227
	NYUCI	59	5.4400	2.2624	0.0170	59	0.0310	0.7811
Not very satisfied	REACH-OUT	50	3.2681	2.2334	0.1448	50	0.2381	0.7864
	NYUCI	49	2.3794	2.2490	0.2912	49	-0.0819	0.7725

REACH-OUT: Resources for Enhancing Alzheimer's Caregiver Health-Offering Useful treatment; NYUCI: New York University Caregiver Intervention; ZCBS: Zarit Caregiver Burden Scale; GDS: Geriatric Depression Scale; N: number; Diff=differences in model-based mean scores between baseline to follow-up administrations; SE: standard error; p: p value;