Peer Enhanced Depression Care: Using Peer Mentors to Provide Self-Care Support to Low Income and Minority Older Adults

Principal Investigator:

Jin hui Joo, M.D., M.A.
Massachusetts General Hospital, Harvard Medical School

Supported by:

The National Institute of Mental Health
R01MH123165
NCT04319094

Version Date:
May 20th, 2020

Date: May 20, 2020_____
Principal Investigator: __Jin Hui Joo_____

Study Protocol

****

1. Abstract

a. Provide no more than a one page research abstract briefly stating the problem, the research hypothesis, and the importance of the research.

Depression affects up to 15% of older adults, is the leading cause of disability worldwide and decreases quality of life and increases mortality. (1, 2) Minority populations face greater risk for depression due to greater burden of medical comorbidity and low socioeconomic status but up to 70% of minority older adults with clinical need do not use mental health services.(1) Peer support involves connecting a person who has a health problem to another person (a peer) who has experienced a similar health condition, someone who 'has been there' and 'lived it'. (3, 4) Persons who have overcome adversity can offer useful encouragement, hope and mentorship, including self-care skills to others facing similar situations and insight that can complement professional health care.(5, 6) Depression is a chronic illness that requires self-management skills to maintain emotion-wellbeing on a daily basis and peer support can be useful for patients who struggle with depression.[7] Peer support has been recognized as useful for depression self-management, (7-9) particularly, among low-income, minority groups, for whom experiential learning through peers rather than teaching from professionals may be preferred.(10) Despite the promise of peer support, the evidence is lacking regarding the use of peer support for low-income and minority older adults with depression.(7, 11-18) We will partner with a committed community organization and employ a rigorous research design to evaluate a novel model of peer support, with the goal of maximizing effectiveness on outcomes and gathering information on implementation to position the program for future sustainability. In this proposal, we will conduct a hybrid effectiveness-implementation study. In the first phase, we will conduct a randomized controlled trial of a peer support program for older adults who are recruited from the community. We hypothesize that participation in the peer program compared to an enhanced usual care program will report decreased depressive symptoms. The community-based peer program, referred to as the peer support program called "**PEERS",** which is a manualized depression care intervention, guided by theories of peer support, social support and social learning,(3, 19, 20) tailored to a resource-poor, low-income, minority older adult population. In the second phase, we will conduct a mediation analysis. Many promising interventions are never implemented and disseminated on a wide scale due to lack of knowledge about implementation outcomes (eg. acceptability, program fit, fidelity) and core components of the intervention (eg. intervention staff selection, training, coaching and performance assessment, staff evaluation as well as systems level factors such as leadership). [21-23],[24] In the third phase, we will evaluate the implementation of the Peer Program by assessing program fit, barriers and facilitators and fidelity of the implementation. New approaches are needed that leverage existing community resources (e.g. peers) to improve depression care for a highly vulnerable group that often does not access traditional mental health services.

2. Objectives (include all primary and secondary objectives)

The specific aims of this proposal are as follows:
(1) To measure the effect of a peer mentoring program on mild to moderate depression compared to social interaction control among minority and low-income adults aged 50+ years recruited from primary care clinics;
H1: Older adults randomized to the Peer Program (vs. control) will report decreased depression (PHQ-9 score decrease $\geq$ 5) at 8 weeks, 3, 6, 9 and 12 months.

We will conduct a randomized controlled trial by enrolling 160 low-income and minority adults and measure the effect of the Peer Enhanced Depression Care Program on mild to moderate depressive symptoms compared to Social Interaction Control. We will recruit a total of 10 peer mentors. The supervised peer mentors who are based in the community will provide social support by telephone with depressed older adults recruited from primary care and the

community for 8 weeks with initial training and ongoing supervision by a clinical social worker. The core components of the Peer Program are: (1) relationship building, active listening, emotionally responsive and patient-centered communication, (2) sharing of experiential knowledge by peer mentors, sharing of coping skills, modeling and communication of positive health messages regarding self-care (3) linkage to community and clinical mental health resources. In Aim 2, we will conduct a quantitative mediation analysis, specifically measuring increase in self-efficacy as the mediating factor. In Aim 3, we will use post-study key informant interviews from a diverse group of stakeholders representing individuals, the community and the primary care clinic to assess implementation process, and we will use checklists to evaluate the fidelity of the intervention.

3. Background (briefly describe pre-clinical and clinical data, current experience with procedures, drug or device, and any other relevant information to justify the research)

We conducted a study that showed ethnic disparity in use of psychotherapy offered in primary care for African American older adults with depression. We capitalized on depression screening and clinical diagnostic assessments that occurred in PROSPECT.(25, 26) We focused on the 582 persons with complete data assessed at baseline.(27) Compared to White older adults, persons who self-identified as African-American were less likely to have received Interpersonal Psychotherapy if they had minor depression even after adjusting for potentially influential covariates (AOR)=0.22, 95% confidence interval (CI)=0.06-0.80). African Americans were less likely to receive psychotherapy than Whites among persons who met criteria for major depression as well. While the intervention "raised all boats," the ethnic disparity persisted even in the intervention practices. Focus on the clinical setting may improve health but not health disparities. A model that is accessible in the community and linked to clinics may be more effective in mitigating health disparities over clinical approaches alone.

We developed a peer intervention and evaluated the feasibility and acceptability of peer mentors for older adults and examined client and peer experiences of the program. We found that engagement was high (90% percent of older adults attended all 8 meetings with the peer). The majority was African American older adults (74%) and 85% had decrease in PHQ-9 scores [Mean 7.1 (SD 7.1) p-value < 0.001].(28) Loneliness decreased (pre-study mean 36.7 ± 5.4; post-study mean 31.4 ± 16.7, p-value 0.03) and coping skills increased (pre-study mean 65.6 ± 13.2, post-study mean 69.9 ± 10.4, p-value 0.006). Older adults emphasized the importance of a trusting relationship, credibility of the peer and usefulness of professional supervision in the program. Participants described benefits such as hope, changes in attitude, behavior and insight. The program also successfully connected older adults to community and clinical resources during and after the study.

We successfully contacted 85% of patients at 12 months and assessed depression with the PHQ-9 by telephone. Sixty-eight percent of patients had PHQ-9 scores that remained below baseline scores by 5 points or more. After completion of the feasibility study, we recruited 27 additional participants (total of 57 older adults) seeking to obtain greater experience with a larger sample of peers and older adults to refine the peer program. We tried telephone delivery of the program for two participants. Although peers found the telephone convenient, relationship building was more difficult, and two older adults missed telephone calls more frequently but attended in-person meetings regularly. Given the importance of problems of loneliness among our study participants, we continued with in-person meetings and used telephone calls infrequently when peers were unable to meet in person due to weather. We concluded that use of supervised peer mentors is a promising model of depression care delivery for older adults. We conducted an analysis using data from 57 older adults in the pilot study to assess whether self-efficacy predicted change in depression. We found that improvement in self-efficacy was associated with a decline in depression.

We studied peer mentor communication that would inform peer training and role development. Our aim was to describe and associate communication behaviors used by supervised peer mentors with working alliance and depression.(29) We used the Roter Interaction Analysis System, a quantitative method to analyze health communication between peers and older adults in the pilot study. We looked at a variety of communication behaviors similar to other studies on communication behaviors in mental health. (30, 31) We found that peers used a variety of skills learned in training. This included client-centered talk, positive rapport building, emotional responsiveness, and education and counseling (see Table 1). Specific communication behaviors such as emotionally responsive talk and education about psychosocial topics were associated with decreased depression (all p<.001). We concluded that trained peer mentors can use skilled communication behaviors that is client-centered to provide depression care services to older adults.

4. Study Procedures

a. Study design, including the sequence and timing of study procedures (distinguish research procedures from those that are part of routine care).

Study flow

- Screen by telephone
- If eligible, conduct clinical evaluation by telephone to assess eligibility for the study
- If not eligible, participant will be given information and a list of community and clinical resources
- If eligible, patient will undergo a baseline assessment
- Participant will be asked if willing to take part in 8 peer meetings, and 6 assessments, or Social interaction/health education visits and assessments by phone.
- If yes, we will proceed to obtain oral consent and enrollment.
- Randomization occurs
- If intervention condition -- contacted by Peer mentor -- begin 8 meetings by phone
- If control condition -- contacted by Study staff and social interaction visits
- Data collected and flagged for urgent referral if needed
- Intervention and Control conditions contacted by Study coordinator to conduct interviews by telephone, post-intervention after 8 visits and at 3 months, 6 months, 9 months and 12 months

We will collaborate with Baltimore CONNECT that was formed as a research partnership in 2013 between Johns Hopkins University and 20+ community-based social organizations. They provide a range of services from peer counseling to workforce development and nutrition support, and is now a designated non-profit. We are guided by community-engaged principles of research emphasizing a partnership approach that is equitable and includes diverse research partners.(32) The Advisory Board of Baltimore Connect will assist with recruitment of peers and help connect older adults to social services they offer. The Advisory Board will give input regarding issues of ethnicity and community culture. Preliminary findings of quantitative and qualitative analyses will be presented at quarterly meetings of the Advisory Board for feedback and interpretation, and will be integrated into the final results.

Study participants

Identification of peer mentors. Participants will be recruited for the intervention trial as follows. Potential peer mentors will be recruited with the help of our community collaborators and through word of mouth referral. We will also advertise in CBO newsletters. Study staff will call potential peer candidates and schedule an interview. If they are chosen based on their interview (eg. interpersonal skills, time in recovery, volunteering experience), study staff will schedule a telephone meeting where consent will be obtained, and they will be invited to participate in the peer training. We will recruit 10 peer mentors, aiming for a balance of men and women. Interested candidates will be interviewed by Dr. Joo and study staff and screened for eligibility criteria. Eligible peers will be consented by Dr. Joo and invited to participate in training. We will measure their depressive symptoms pre and post as well as conduct interviews with them upon completion of the study. Peers who are not chosen for continued participation in the study after training will be referred to other peer mentoring opportunities.

Training for peer mentors. We developed a training program that was used in our pilot study. Study staff will conduct 5 sessions totaling 20 hours of training using videoconference that will serve as an introduction to the peer mentor role with continued training and skills development occurring during the supervision meetings. Training will include taking a client-centered approach, using effective communication skills, including appropriate self-disclosure, client and peer safety and client confidentiality, expression of empathy, active listening, goal-setting, sharing coping skills and other depression self-care skills. Establishing relationship boundaries is critical to ensuring that clients benefit from peer support. Training on this issue will be provided initially and continually reinforced in supervision meetings. Training will also include experiential learning, role-play, and discussion of client cases. The peers will receive training in appropriate use of audio-recordings during the meetings with participants, the submission of the audio-recordings to the clinical supervisor on a weekly basis and the handling of the recordings overall. After completion of training, study staff will assess peer mentors for suitability to be matched, taking into consideration attendance, active participation, commitment and demonstration of interpersonal and communication skills. Those peers who exhibit core peer skills and commitment will be matched with clients. Peer mentors will be paid for meetings with the depressed older adults and supervision meetings with the social worker.

Identification of depressed older adults. We will recruit older adults from the community with the assistance of our community partners. We will make presentations at community-based organizations, attend health-fairs and community-based research events and also disseminate flyers. We will target 5-7 older adults for enrollment and randomization monthly. We anticipate peer mentors will be able to manage 2-4 clients at one time from our experience in the pilot study. The research coordinator will screen clients by telephone for depressive symptoms with the PHQ-9, a self-report instrument that is keyed to DSM-IV-R criteria for Major Depression and widely used in primary care.[33, 34] Eligible clients will include those with depressive symptoms (defined as a PHQ-9 score of 5 or greater) who have been experiencing depressive symptoms for at least two weeks. Eligible clients will be scheduled for a clinical assessment with a mental health clinician to be done by telephone.

We will also recruit depressed older adults from primary care clinics. Study staff will make presentations of the study at the primary care clinics to clinic staff and ask for patient referrals. Study staff will place flyers in the waiting rooms for patients to take so patients can contact the study directly. Referred patients will be contacted by study staff and screened by telephone and patients who self-refer will be contacted and screened for study eligibility. Those who are eligible for the study will be scheduled for a mental health evaluation by a mental health clinician to be done by telephone.

Clinical staff at Beacham clinic at Bayview will refer patients using EPIC in basket. Study staff will obtain the patient contact information, (name, address and telephone number) from Epic and send a letter describing the study to the patient to opt in to the study. The letter will contain a number to call and a card to mail if they want to receive any communications from the study. If they want more details, we will provide it. We will ask if they would like to undergo a phone screening. If they agree, study staff will do a phone screen. The patient's name, address and telephone number will be entered into a database that will be stored in a secure Massachusetts General Hospital server. Any PHI of participants who do not contact us will be destroyed within 6 months. PHI of patients who call us will be saved per protocol. We add another method of referral because we have not gotten enough referrals with flyers and PCPs say they would like to refer but their busy clinic schedule is a significant barrier. PCPs say that ability to refer through EPIC will facilitate referrals..

Clinical assessment. A clinical social worker will perform the clinical assessment by telephone. She will repeat the PHQ-9 and conduct an assessment for Major Depression, manic episodes, alcohol abuse, substance abuse and psychotic disorders using the MINI (Mini-International Neuropsychiatric Interview). The clinical assessment will ensure that the participants are appropriate for a peer program in terms of depression severity and acute psychiatric symptoms. The clinical assessment will include history of present illness, psychiatric and medical history as well as psychosocial assessment for use by the social worker to provide relevant guidance to peer mentors during weekly supervision meetings. If the older adult is eligible after the clinical assessment, oral consent for participation in the study will be obtained and oral consent form will be mailed to the participant. After oral consent is obtained, the participants will undergo a baseline assessment. The assessment will consist of questions to obtain demographic information, medical use and depression care history as well as questionnaires to measure primary and secondary outcomes and mediators. Then the participants will be randomized to intervention or Social Interaction Control. The clinical and baseline data will be stored in a secure online Massachusetts General Hospital server that only study staff will be able to access.

Randomization procedures. After a clinical and with informed consent, eligible clients will be randomized in a 1:1 ratio, to receive either: (1) the Peer Enhanced Depression Care Program or (2) Social Interaction Control. We will use MS Excel VBA-based software developed by the study statistician to allocate participants using dynamic urn minimization to balance study arms by sex.(35) These procedures will maintain allocation concealment throughout the trial, consistent with the CONSORT recommendations.[69] At the time of randomization, primary care physicians will be informed of the client's assignment with consent of the participant.

The intervention: PEERS. In our program trained and supervised older peer mentors with experiential knowledge of depression and self-care skills deliver depression care to low-income and minority older adults. The primary role of the peer mentors is to build relationship, provide emotional support, facilitate simple goal setting, share coping skills and depression self-care skills and connect to clinical and community resources for depression upon completion of the program. The program is relationship-based and takes an empowerment strategy to increase self-efficacy in depression self-care.(36) We use strategies to enhance cultural appropriateness of our program for minority and low-income older adults such as avoiding stigmatizing clinical language about mental health, respecting non-medical self-

care methods such as religious coping, taking a non-judgmental attitude, accommodating client preferences, being aware of the impact of hierarchy and power relations.(37) The peer mentor will be supervised by a licensed clinical social worker.

Matching and scheduling of visits. Once the randomization has been completed, the older adults will be informed of their assignments. The social worker will call the peer mentors to provide contact information and brief summary of the older adult with whom they are matched. Then the peer mentors will contact the older adult and set a time and place for the meeting. Peer mentors will meet with older adults for 8 meetings weekly for 45 minutes to an hour each. Each meeting will be audio-recorded. Meetings will be by telephone.

Supervisory role of the social worker. Supervision is important to sustain the quality of the program and to support peer mentors.(38, 39) For quality assurance, the social worker will contact the client by telephone after the 1st meeting with the peer mentor to assess any problems with the peer mentor or the content of the meetings during a 10-minute call, document the content of the call and provide feedback to the peer mentor during supervision meetings. Peer mentors will meet by videoconference in groups of 2 on a weekly basis concurrent with meetings with clients for supervision, provided by two licensed clinical social workers with experience in mental health. During meetings, the social worker will elicit insights from peer mentors, discuss progress and problem-solve challenges e.g., lack of engagement and motivation. The supervision meetings will also allow the social worker to monitor the well-being of the peer mentor. The social worker will document the activities of supervisory meetings, maintain logs of peer meetings with clients, collect audio-recordings and questionnaires. A geriatric psychiatrist will be available for consultation to the social worker to problem–solve difficult situations. Peer mentors will have access to the social worker by telephone as needed outside of supervision meetings.

Linkage to community-based resources. Study staff will develop a list of community-based organizations with relevant resources that the peer will give and encourage the older adult to use at the 8th meeting. For low-income older adults, access to social and material resources such as food pantries, senior centers and community clinics may be as important to address as the depression itself and ability to access such services may be an important part of self-care for depression.(40)

Referral to clinical care. The older adult will be asked if they want referral to specialty mental health care if not engaged in professional care at initial clinical evaluation, during the meetings with the peer mentor and upon completion of the study. If the older adult's depression becomes severe (PHQ-9 > 15), the social worker will refer client to specialty mental health care services. If the client desires to continue to participate in the study, they will be allowed to do so.

Inclusion/exclusion criteria for peers: Inclusion criteria: (1) 50 years and older, (2) history of depression, (3) at least 5 years in recovery, and (4) received basic training in behavioral health or have volunteer experience in mental health. Exclusion criteria: (1) meet current diagnostic criteria for Major Depressive Disorder; (2) meet current diagnostic criteria for a manic episode or a psychotic disorder; (3) meet current diagnostic criteria for substance abuse disorder.

Inclusion/exclusion criteria for depressed older adults: Inclusion criteria are: (1) 50 years and older; (2) depressive symptoms with PHQ-9 scores $\geq$ 5; (3) belong to an underserved population, defined as annual income less than 200% of the federal poverty level ($24,120) or self-identified ethnic minority; (5) able to communicate in English; and (6) willing to give informed consent. Exclusion criteria are: (1) meet diagnostic criteria for mania or hypomania; (2) meet diagnostic criteria for psychotic syndrome; (3) meet diagnostic criteria for substance abuse or dependence; (4) acutely suicidal; and, (6) a score on the Mini-Mental State Examination (MMSE) $\leq$ 24.(41, 42) The Mini-Mental State Exam is a short standardized mental status examination that has been widely employed for clinical and research purposes for global assessment of cognitive functioning.(41) Clients who meet diagnostic criteria for severe depression, cognitive impairment, mania, hypomania, a psychotic disorder, or substance abuse or dependence will require clinical treatment. The research coordinator will also provide referrals for psychiatric care and list of community-based resources to the client. Eligible older adults will be scheduled for a clinical assessment.

Comparison condition. This group will receive 8 weekly visits and phone calls by study staff that will consist of social interaction. The staff member will receive training and receive supervision from the PI. The purpose is to provide social interaction that does not focus on peer support for depression, goal-setting nor self-care skills. Study

staff will monitor for worsening depressive symptoms and the client will be referred to mental health services as appropriate. The telephone visits will be audio-recorded and feedback given during weekly team meetings where study processes and problems will be discussed.

Implementation evaluation. Upon completion of the trial, we will collect implementation data of the Peer Program by conducting semi-structured interviews with diverse stakeholders representing multilevel perspectives upon completion of the trial. The purpose is to ensure that if the intervention is found to be efficacious, it can be successfully implemented in other non-research settings. Specifically, we will assess program fit, facilitators and barriers to implementation, and fidelity.

Program fit & facilitators and barriers to implementation and scale-up: We will ask Advisory board members and our Baltimore Connect collaborators to refer organization staff whom we can interview by telephone. When referred, study staff will contact them and if interested in being interviewed, scheduling will take place. Prior to the interview, oral consent will be obtained. For stakeholders involved in healthcare, the PI who works in primary care clinics works with primary care providers, medical directors and administrators whom she will identify. Study staff will reach out by email or telephone and ask if they would be interested in being interviewed for our study. If interested an interview will be scheduled by telephone. Oral consent will be obtained prior the interview.

We will identify and interview 1) older adult participants who complete the either the 8-week intervention or social interaction calls and 2) intervention staff e.g. peer mentors and social workers who participate in the study. The PI and trained team members will conduct semi-structured interviews lasting 30-45 minutes by telephone to obtain perspectives on topics described in Table 4 below. We will continue to conduct interviews until no new themes are presented. We will also conduct semi-structured interviews by telephone with community-based organization staff; Johns Hopkins Community Physicians (JHCP) providers and administrators to obtain feedback on intervention implementation and dissemination. Guided by the Consolidated Framework for Implementation Research (CFIR), they will be asked about the intervention on complexity, adaptability to local needs, relative advantage versus another type of intervention, and potential for sustainability. They will review the intervention and training materials to ensure that they can be readily implemented and sustained in their organization. Their insights will ensure that we develop a program that is beneficial to the target population as we prepare the intervention for future replication.

Qualitative analytic strategy. The audio recordings of semi-structured interviews conducted with multiple stakeholders will be transcribed professionally. The transcripts will be analyzed using thematic analysis which is a flexible and commonly used approach in qualitative analysis. The study team members will proceed through 4 phases: 1) immersion in the data by reading and re-reading the data, 2) generation of initial codes, 3) sorting of codes into themes, and 4) review and refinement of themes based on coded extracts and relevance to the entire dataset. To ensure trustworthiness, the PI and two trained study team members will code a subset of transcripts independently, compare their agreement on segments of coded data and resolve disagreements through in-depth discussion. We will use 80% agreement as a benchmark for acceptable inter-rater reliability. Because we anticipate 10-15 different codes, we do not think it necessary to use a Kappa statistic to correct for chance agreement. The coding scheme will be revised to reflect their feedback prior to coding of the remainder of the transcripts. The PI and study team members will meet on a weekly basis during the data analysis period to discuss in depth the rationale for coding and theme generation, and will resolve disagreements by negotiated agreement. Our advisory board will review and provide feedback on the coding scheme and study results. Qualitative data analytic software, NVIVO11, (QSR Intl, Durham UK) will be used.

b. Study duration and number of study visits required of research participants.

The study will be 18 months in duration. Research participants in the intervention will have a baseline, 8 meetings with the peer mentor, a post-study assessment and assessments at 3, 6, 9 and 12 months, for a total of 14 study visits. Participants in the control condition will have the same number of study visits.

c. Blinding, including justification for blinding or not blinding the trial, if applicable.

The person conducting the post-study assessment will be blinded. No other blinding is possible given the nature of the intervention.

d. Justification of why participants will not receive routine care or will have current therapy stopped.

Patient will be free to obtain depression care outside of the study, as desired.

e. Justification for inclusion of a placebo or non-treatment group.

We will not use a placebo group. The control condition will consist of visits and phones by study staff to provide social interaction.

f. Definition of treatment failure or participant removal criteria.

If any participant experiences worsening of depression symptoms (eg. expression of suicidal ideation, worsening PHQ-9 scores that indicate severe depression) then the participant will be referred to professional mental health treatment. Typically, appointments with mental health providers are difficult to obtain immediately. If there is no objection from the participant, the peer will continue the weekly meetings with the participants while he/she waits for the appointment until they complete the 8 meetings.

g. Description of what happens to participants receiving therapy when study ends or if a participant's participation in the study ends prematurely.

The peer mentor will be guided to anticipate the needs of the participant when the study ends. The peer and the participant will discuss community-based resources and study staff will also assist in linking the participant to both professional depression treatment/services. The same will occur if the participants ends the study prematurely.

5. Drugs/ Substances/ Devices - NA

a. The rationale for choosing the drug and dose or for choosing the device to be used.
b. Justification and safety information if FDA approved drugs will be administered for non-FDA approved indications or if doses or routes of administration or participant populations are changed.
c. Justification and safety information if non-FDA approved drugs without an IND will be administered.

6. Study Statistics

a. Primary outcome variables

Primary outcome: The primary outcome will be depression, measured by the Patient Health Questionnaire (PHQ-9). A change of 5 points on the 0 to 27 point PHQ-9 scale corresponds to the minimal clinically important change for an individual.(34) Therefore, an improvement of 5 or more points on the PHQ-9 will be defined as response to the Peer Program. Studies with repeated PHQ-9 measures have shown that practice effects did not result in inability to detect changes in depressive symptoms even when depression was measured on a daily basis. (43, 44)

b. Secondary outcome variables.

Secondary outcomes will be engagement, coping, health service use, emotional, social and physical function. Engagement will be defined in two ways: 1) as attendance of 80% of meetings as reported by peer mentors (45) and 2) score on the Working Alliance Inventory-SR, a short 7-item questionnaire that measures affective bond, agreement on tasks and goals, and has been used to measure working alliance in non-professional relationships in mental health.(46, 47) Studies of working alliance typology has shown the sensitivity of this instrument in repeated assessments.(48) Service use will be measured with the Cornell Service Index, a questionnaire that includes use of both clinical and informal community-based health services and used in depression care studies among older adults.(49) Physical, social and emotional functioning will be assessed using the Medical Outcomes Short Form (SF-36).(50, 51) Self-efficacy will be measured with the General Self Efficacy Scale, a 10-item scale validated for use in multicultural populations. (52) Loneliness will be measured with the R-UCLA loneliness scale, a commonly used, 20-item, self-report questionnaire.(53) The Brief Cope is widely used in depression studies which assesses trait and state coping developed from the COPE inventory which assesses different coping dimensions.(54)

Covariates. We will obtain sociodemographic factors by self-report that will include age, education level, marital status, ethnicity, medical comorbidity, past and current depression treatment. We will use the Life Events Questionnaire to measures changes occurring in the past year and the impact of the event on a 4-point scale.(55, 56) Medical comorbidity will be measured with the WHO WMH CIDI that has been established for use among older adults and has proven validity and reliability.(57) New uptake of depression care services such as professional counseling and antidepressant medications will be obtained by self-report at each meeting by the peer mentor to assess for service use during the intervention. These variables will be used to describe the sample, compare intervention and control groups and used as covariates in analyses. Health-related social determinants consisting of 5 core components such as housing, food, transportation, utility needs, and safety will be measured with the Accountable Health Communities Core Health-Related Social Needs Screening Questions. (58)

Primary analyses will be intention-to-treat. Descriptive statistics (e.g. frequencies, means, standard deviations, medians, interquartile ranges) and graphic displays will be generated for all study variables to ensure that distributional and other assumptions of the planned analyses are met. We will minimize missing data using our team's documented retention strategies that have resulted in only 14% attrition.[37] All primary analyses will be adjusted for sex, demographic factors, life events, medical comorbidity, and use of mental health services. Hypothesis tests will be two-sided with alpha=0.05.

c. Statistical plan including sample size justification and interim data analysis.

Table 3. Assessment schedule

Variable	Measure	Timing of assessments												
		0 wk	1 wk	2 wk	3 wk	4 wk	5 wk	6 wk	7 wk	8 wk	3 mth	6 mth	9 mth	12 mth
Sociodemographic factors	Self-report	x												
Depression (self-report)	PHQ-9	x	x	x	x	x	x	x	x	x	x	x	x	x
Depression (assessed by clinician)	Mini-International Neuropsychiatric Interview (MINI)	x								x	x	x	x	x
Client engagement	At least 80% attendance of meetings, peer logs of meetings	x	x	x	x	x	x	x	x	x				
Client engagement	Working Alliance Inventory-SR	x	x	x	x	x	x	x	x	x				
Physical, social and emotional function	Medical Outcomes Study Short Form 36	x								x	x	x	x	x
Self-efficacy	General Self Efficacy Scale	***x***	***x***	***x***	***x***	***x***	***x***	***x***	***x***	***x***		***x***		***x***
Loneliness	R-UCLA Loneliness Scale	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**		**x**		**x**
Coping skills	Brief Cope	x								x	x	x	x	x
Medical comorbidity	WHO WMH CIDI	x								x	x	x	x	x
Clinical and community health service use	Cornell Service Index	x								x	x	x	x	x
New uptake of counseling and antidepressant	Self-report	x	x	x	x	x	x	x	x	x				
Social determinants of Health	Accountable Health Communities Core Health-Related Social Needs Screening Questions	x								x	x	x	x	x

Our primary study aim is to test the effects of the *Peer Enhanced Depression Care Program* for reducing depressive symptoms compared to Enhanced Usual Care. H1: Older adults randomized to the Peer Program (vs. control) will report decreased depression (PHQ-9 score decrease ≥ 5) at 8 weeks, 3, 6, 9 and 12 months. To assess the immediate effects of treatment, we will fit a mixed effects model(59) with nested random effects for counselor and participant such that $E[y_{ij}]=\beta_0+\beta_1 tx+\beta_2 week+\beta_3 tx*week$, adjusted for sex and other covariates (see 7.a.), where y_{ij} is the PHQ9 score for the *i*th individual at intervention week *j*, β_2 is the rate of change in PHQ-9 for individuals randomized to EUC, and β_3, the coefficient of interest, is the difference in rates of change in PHQ-9 between the Peer Program and Enhanced Usual Care study arms. To assess durability of the intervention effects, we will model PHQ-9 at each post-intervention follow-up (months 3,6,9 and 12) using a time-averaged model, which adjusts for PHQ-9 at week 8 and models PHQ-9 scores at later time points as a function of treatment assignment.

Sample size and power

We calculated power to detect a difference in rate of PHQ-9 decline over the 8-week intervention period via simulation. Assuming 20% attrition, design effect of 1.2 (to account for clustering within peers (62) based on ICCs from pilot data), and regression parameters from our preliminary data (SD of random intercept: 2.83; SD of random errors: 0.11), with N=160, we would have 99% power to detect a difference in slope of 0.625, which corresponds to a between-group difference of 5 points on the PHQ-9 at 8 weeks. Similarly, we calculated power to detect a sustained post-intervention between-group difference. We will have 99% power to detect a sustained 5-point difference in PHQ-9 during that period.

Data and safety monitoring plan

We will have a Data and Safety Monitoring Board (DSMB) to monitor the study with an attendant monitoring plan that will involve interim analysis. We will provide descriptive data for the first 6 months after the first participant has enrolled in the study to review both the non-serious and serious adverse event rates. We will meet every 6 months and also meet on an ad hoc basis if the real time serious adverse events warrant meeting, in their judgment.

d. Early stopping rules.

At any time during the study, based on the findings of interim data analysis, the DSMB can put the study on either temporary hold or stop the study entirely after notifying the Principal Investigator and the IRB. In the unlikely case that results show that the intervention worsens depression, the study will be stopped.

7. Risks

a. Medical risks, listing all procedures, their major and minor risks and expected frequency.

Older individuals, especially those with chronic illness, can easily feel overwhelmed or fatigued by what would be minimally demanding tasks for others, and, therefore, we include this discomfort in the potential risks. A minority of participants may respond to certain interview questions with feelings of sadness and grief (e.g., upon being reminded of interpersonal problems and social isolation). The Principal Investigator's experience as a researcher and psychiatrist has shown that when asking delicate questions and providing feedback on sensitive topics, the vast majority of participants have sufficient coping strategies to avert the extremes of behavior that put them at risk. Additionally, peer mentors are trained to be emotionally responsive with older adult participants to alleviate distress rather than increase distress. It is expected that older adults will feel relieved to meet with peer mentors who listen actively without being directive as has been our experience in the pilot study. We expect that the proposed study will provide older adult participants with benefits such as the discussion of psychological issues with the peer mentor that may offset the inconveniences or other consequences of participation.

Expression of suicidal ideation is always a risk when working with depressed participants. We will have a protocol in place to evaluate and manage patients who express suicidal ideation. We believe the risk that patients will experience due to this intervention is very low and are further minimized by the procedures we put in place, such as initial clinical evaluation prior to being matched with a peer and regular monitoring for depressive symptoms. The peer mentor will receive supervision by a clinical social worker and consultation by a geriatric psychiatrist as needed and available at all times by telephone or pager. In the case that suicidal ideation is identified, a clinical intervention (see below).

For peer mentors who have a history of depression (an inclusion criteria for the proposed pilot RCT), the risk of worsening mental health problems is possible because the peer role requires regular interaction with depressed older adults, which can be emotionally difficult. Peer mentors may become overwhelmed in their meetings with these clients. We have designed the study to minimize the risk to peer mentors (described below).

b. Steps taken to minimize the risks.

Undue emotional distress. Regarding undue emotional stress, peer mentors will be trained to recognize and provide support to manage undue emotional distress. Peer mentors will be trained to contact the social worker who will be available by telephone when emotional distress is extreme. A geriatric psychiatrist will be available in the case that the social worker is unable to manage the older adult's distress. Multiple strategies will be used to prevent adverse events: 1) rigorous screening of the patient's appropriateness for a peer mentoring program performed by a mental health professional prior to matching, 2) rigorous training and continuous supervision of the peer to prevent escalating emotional distress, and 3) availability of professional staff to address peer mentor's concerns by phone at all times. In the event that the peer mentor needs assistance, the peer will contact the supervising social worker who will then speak with the older adult regarding the problem. In our experience, peers were able to detect signs in the older adult of escalating distress and they were able to follow the established protocol without adverse events.

Suicidal ideation. When conducting studies with depressed patients, expression of suicidal ideation is a risk. We address this risk in multiple ways. We will conduct a clinical evaluation prior to matching to assess the older adult's appropriateness for peer mentoring. In our previous work, expressions of suicidal ideation were rare because we assessed for depression severity and appropriateness for peer services during the initial clinical evaluation and such persons were excluded and referred for appropriate care. Also, peer mentors recruited for this study will receive training in working with clients who express suicidal ideation and will be rigorously trained in the protocol to ensure the safety of the older adults. Peers will conduct the PHQ-9 with clients weekly. This questionnaires includes a question about presence of suicidal ideation. If the client expresses suicidal ideation during a meeting, the peer mentor will call the social worker who will manage the client.

Assessment by the clinical social worker may involve the following questions: (1) Do you have a desire to hurt yourself that you think you might act on? (2) Do you have a plan for hurting yourself and intend to carry the plan out? Older adults may also be identified as a high risk for suicide if the older adult reports a specific plan to commit suicide, or if the older adult has risk factors for suicide. Risk factors may include multiple suicide attempts, moderate to severe depression, a high level of hopelessness, immediate access to a lethal method, a lack of reasons for living,

psychosis or mania, poor social support or a recent stressful life event. Additional probing may be necessary to identify any other risk factors (e.g., access to a firearm). The social worker will ensure and facilitate urgent referral, transfer, or escort of high risk patients to the Emergency Department near their home where an evaluation to assess need for treatment will be done. A geriatric psychiatrist (Dr. Joo) will be available for consultation in situations where the social worker needs assistance. In our experience, one instance of suicidal ideation (1 older adult) did arise, the trained peer mentor contacted the PI who spoke with the client and managed the situation without adverse events.

Support for peer mentors. We also will take precautions to decrease risk of emotional distress for peer mentors. These precautions include the following: 1) enroll peer mentors who have 5 or more years in recovery, 2) provide regular weekly supervision and monitor the health of the peers, and 3) encourage mutual support among peer mentors in the study. We will aim to recruit peer mentors who are at low risk of relapse, which we will be determined by length of time in recovery and level of function, such as ability to volunteer, engage in community activities or paid employment. Training will reinforce that peer mentors are not clinicians, are not expected to be clinically responsible for depressed older adults, and that their role is one of informal psychosocial support. The social worker who is the supervising mental health professional will regularly monitor the peer mentor's emotional well-being and address any signs of distress. If any peer mentor expresses emotional distress or the social worker detects signs during supervisory meetings such as irregular attendance and role performance, the social worker will discuss and provide support to the peer mentor. If the peer mentor experiences depression that rises to the level of clinical depression, the social worker will ensure that the peer is receiving clinical care, will discuss with the peer whether continued participation in the study is feasible and may conclude that a peer's participation in the study should be suspended until the peer's depression is no longer clinically significant.

The approach of the supervising professional will be to accommodate the needs of peer mentors in their role, e.g. Non-clinical, psychosocial support role. Supervisory meetings will also encourage mutual support among peer mentors in the study. Finally, qualitative studies of peers suggest that peers benefit positively from being in a helping role, despite concerns about increased vulnerability. We interviewed peer mentors in our preliminary work (pilot study) in which they interacted with depressed older adults, and peer mentors stated that working in a role to help others who are struggling with depression gave their lives purpose, gave them opportunities for continued learning, and contributed to sustaining their own recovery. Our experience is based on a small number of peer mentors but is supported by studies that have shown the benefits of being in helping roles. Peer mentors will be trained to report any expression of self-harm immediately to the Program Coordinator who will enlist the Social Worker and Geriatric Psychiatrist as needed.

c. Plan for reporting unanticipated problems or study deviations.

Although we are not studying experimental drugs, the intervention is experimental with the attendant risks. To address this, we will have a Data and Safety Monitoring Board (DSMB) to monitor the study with an attendant monitoring plan. The role of the DSMB will be to ensure that no unexpected, untoward consequences of the experimental intervention occur, and if they do, to implement safeguards to decrease or eliminate future risks. Although the risk is low, the Peer Program could induce emotional distress associated with discussion of past trauma or current stressors. We will include as serious adverse events acts of suicide or attempted suicide and threats of violence or violence toward the research team, providers or outside personal contacts. Any adverse events related to behavior will be provided to the DSMB in real time. These adverse events include, but are not limited to, suicidality, homicidality, or inappropriate or threatening behavior with the research or clinical staff. Less serious adverse events related to the treatment of depression will be compiled and summarized for the DSMB at their scheduled meetings. All other severe adverse events in participants will be monitored by the Principal Investigator, the Study Coordinator, and the Social Workers and will be reported to the DSMB regardless of a priori expectation or investigator assessment of likelihood of the study being the cause of the adverse event.

The DSMB will also have the power to request further data (e.g. depression outcome data) from the Principal Investigator based on any concerns that may be raised in the ongoing investigation in the scientific community. Interim analyses will be performed and compiled for review by the DSMB. At any time during the study, based on its findings, the DSMB can put the study on either temporary hold or stop the study entirely after notifying the Principal Investigator and the IRB. In the rare case in which they have to do so, the DSMB will generate a formal report to the Principal Investigator, the sponsor (NIMH), and the IRB. This report would then be modified for a lay reader, a

version for past participants and current participants would be produced, and the letter would be sent to all past and current study participants and their referring providers.

The DSMB will first meet 6 months after the first participant is enrolled to review both the non-serious and serious adverse event rates. They will meet annually and also meet on an ad hoc basis if the real time serious adverse events warrant meeting, in their judgment. The format of the meeting will include a presentation of the summarized data by the Principal Investigator and the Biostatistician. The absolute rates of adverse events as well as the rate compared between the intervention and control groups will be presented. After presentation by the study team, the DSMB will be left to confer alone. If deemed to be warranted, as described above, the DSMB can request a temporary hold be placed on the study until further data are reviewed.

d. Legal risks such as the risks that would be associated with breach of confidentiality.

For older adult participants, risks regarding breach of confidentiality and disclosure of clinical information exist and may be heightened due to use of non-professional peer mentors in the proposed study. Should confidentiality safeguards fail, there is potential harm in the form of social risks and disclosure of private information. However, the risks of participation should be no more than minimal, with effective confidentiality safeguards. The safeguards include the following: 1) Peer mentors will sign a contract of confidentiality agreement before participating in the project, receive confidentiality training and the importance of confidentiality will be stressed throughout training and supervision sessions on a weekly basis. 2) Older adult participants will be informed that absolute confidentiality cannot be guaranteed but study staff will put rigorous procedures in place. In our experience, there were no known breaches of confidentiality in our pilot study, older adults did not express concern about this during the consent process, and none dropped out of the study for this reason. All information collected will be coded with a study identification number and will be stored in locked files that only staff associated with the study can access. These records will be protected by the confidentiality system of Massachusetts General Hospital and will not be disclosed except as required by law. Audio recordings will be saved in Massachusetts General Hospital OneDrive.

e. Financial risks to the participants.

There are no costs to the participant associated with the study and we do not foresee financial risks to them.

8. Benefits

a. Description of the probable benefits for the participant and for society.

The proposed study may benefit the older adult participants in terms of psychoeducation and self-care skills associated with depression, monitoring of symptoms and services delivered by a peer mentor who is under a mental health professional's supervision. The peer may benefit from increased sense of self-efficacy in helping another person and will have an increased knowledge base from the mental health training provided by the study. Benefits to society may include new knowledge regarding the provision of mental health services in the community. If the peer program is successful, new ways to provide depression care services in the community setting to low-income minority older adults will be established. The risks to the patient for participating in this project are minimal and the possibility of improving depression care is substantial.

A.4. Importance of knowledge to be gained

This research will inform the development of peer programs whose aim is to improve access and engagement of depression care among minority and low-income populations. Given that minority older adults receive inadequate or no mental health care and are less likely to access traditional mental health services, developing new methods of delivering depression care is important.

9. Payment and Remuneration

a. Detail compensation for participants including possible total compensation, proposed bonus, and any proposed reductions or penalties for not completing the protocol.

Peer mentors - Each peer will participate in 20 hours of training conducted by the PI and also meet weekly for supervision with the social worker for each contact hour with the client. Peer mentors will be paid $100 for attending 20 hours of training. They will be only be paid if training is completed and they are successfully matched with at

least 1 depressed older adult participant. Peer mentors will be also paid a total of $50 for 1 meeting with a client and 1 supervision meeting. For each older adult who will receive 8 meetings with the peer, peer mentors will receive $400. They will receive an additional $20 for a post-study interview.

Older adult incentives - Participants will be given a token of appreciation of $30 with for one (1) baseline assessment meeting, 8 week assessment, 3, 6, 9 and 12 month follow up assessments for total of 6 assessments for a total $180.

Participant incentives for interviews: Each participant will be given $50 per interview. We will conduct individual interviews with approximately 20 older adults, 2 social workers, 10 peer mentors, 20 community organization staff, 20 primary care staff and 10 health system administrators.

10. Costs

a. Detail costs of study procedure(s) or drug (s) or substance(s) to participants and identify who will pay for them. NA

References

1. Byers AL, Arean PA,Yaffe K: Low use of mental health services among older Americans with mood and anxiety disorders. Psychiatr Serv 2012; 63:66-72
2. Das AK, Olfson M, McCurtis HL, et al: Depression in African Americans: breaking barriers to detection and treatment. J Fam Pract 2006; 55:30-39
3. Dennis CL: Peer support within a health care context: a concept analysis. International journal of nursing studies 2003; 40:321-332
4. Simoni JM, Franks JC, Lehavot K, et al: Peer interventions to promote health: conceptual considerations. The American journal of orthopsychiatry 2011; 81:351-359
5. Davidson L, Chinman M, Sells D, et al: Peer support among adults with serious mental illness: a report from the field. Schizophrenia bulletin 2006; 32:443-450
6. Mayer MK, Urlaub DM, Guzman-Corrales LM, et al: "They're Doing Something That Actually No One Else Can Do": A Qualitative Study of Peer Support and Primary Care Integration. J Ambul Care Manage 2016; 39:76-86
7. Yeung A: Self-Management of Depression, Cambridge, UK, Cambridge University Press, 2010
8. McCusker J, Cole MG, Yaffe M, et al: A randomized trial of a depression self-care toolkit with or without lay telephone coaching for primary care patients with chronic physical conditions. Gen Hosp Psychiatry 2016; 40:75-83
9. Lorig KR,Holman H: Self-management education: history, definition, outcomes, and mechanisms. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine 2003; 26:1-7
10. Perry E, Swartz J, Brown S, et al: Peer mentoring: a culturally sensitive approach to end-of-life planning for long-term dialysis patients. American Journal of Kidney Disease 2005; 46:111-119
11. Grossman EH, Rizzolo PJ,Atkinson V: Geriatric peer-counseling. Pilot project provides support for the homebound elderly. North Carolina Medical Journal 1992; 53:296-298
12. Ho AP: A peer counselling program for the elderly with depression living in the community. Aging and Mental Health 2007; 11:69-74
13. Park M,Unutzer J: Geriatric depression in primary care. Psychiatr Clin North Am 2011; 34:469-487, ix-x
14. Bilsker D, Goldner EM,Jones W: Health service patterns indicate potential benefit of supported self-management for depression in primary care. Canadian journal of psychiatry. Revue canadienne de psychiatrie 2007; 52:86-95
15. Bilsker D, Goldner EM,Anderson E: Supported self-management: a simple, effective way to improve depression care. Canadian journal of psychiatry. Revue canadienne de psychiatrie 2012; 57:203-209
16. McCusker J, Lambert SD, Cole MG, et al: Activation and Self-Efficacy in a Randomized Trial of a Depression Self-Care Intervention. Health education & behavior : the official publication of the Society for Public Health Education 2016; 43:716-725
17. Waitzkin H, Getrich C, Heying S, et al: Promotoras as mental health practitioners in primary care: a multi-method study of an intervention to address contextual sources of depression. Journal of community health 2011; 36:316-331
18. Weber BA, Roberts BL, Resnick M, et al: The effect of dyadic intervention on self-efficacy, social support, and depression for men with prostate cancer. Psycho-oncology 2004; 13:47-60
19. Bandura A: Social Learning Theory, New York, General Learning Press, 1977
20. Marroquin B: Interpersonal emotion regulation as a mechanism of social support in depression. Clin Psychol Rev 2011; 31:1276-1290
21. Proctor E, Silmere H, Raghavan R, et al: Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. Administration and policy in mental health 2011; 38:65-76
22. Onken LS, Carroll KM, Shoham V, et al: Reenvisioning Clinical Science: Unifying the Discipline to Improve the Public Health. Clin Psychol Sci 2014; 2:22-34

23. Bertram RM, Blase, K., Shern, D., Shea, P., & Fixsen, D.: Implementation opportunities and challenges for prevention and health promotion initiatives. , Alexandria. VA, 2011
24. Fixsen DL, Blase KA, Naoom SF, et al: Core Implementation Components. Research on Social Work Practice 2009; 19:531-540
25. Bruce ML, Ten Have TR, Reynolds CF, 3rd, et al: Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. JAMA : the journal of the American Medical Association 2004; 291:1081-1091
26. Gallo JJ, Bogner HR, Morales KH, et al: The effect of a primary care practice-based depression intervention on mortality in older adults: a randomized trial. Annals of internal medicine 2007; 146:689-698
27. Joo JH, Wittink M,Dahlberg B: Shared Conceptualizations and Divergent Experiences of Counseling Among African American and White Older Adults. Qualitative Health Research 2011; 21 1065-1074
28. Kroenke K, Spitzer RL,Williams JB: The PHQ-9: validity of a brief depression severity measure. Journal of general internal medicine 2001; 16:606-613
29. Joo JH, Hwang S, Abu H, et al: An Innovative Model of Depression Care Delivery: Peer Mentors in Collaboration with a Mental Health Professional to Relieve Depression in Older Adults. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry 2016; 24:407-416
30. Cruz M, Roter D, Cruz RF, et al: Psychiatrist-patient verbal and nonverbal communications during split-treatment appointments. Psychiatr Serv 2011; 62:1361-1368
31. Castillo EG, Pincus HA, Wieland M, et al: Communication profiles of psychiatric residents and attending physicians in medication-management appointments: a quantitative pilot study. Academic psychiatry : the journal of the American Association of Directors of Psychiatric Residency Training and the Association for Academic Psychiatry 2012; 36:96-103
32. Israel BA, Coombe CM, Cheezum RR, et al: Community-based participatory research: a capacity-building approach for policy advocacy aimed at eliminating health disparities. Am J Public Health 2010; 100:2094-2102
33. Spitzer RL, Kroenke K,Williams JB: Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA : the journal of the American Medical Association 1999; 282:1737-1744
34. Lowe B, Kroenke K, Herzog W, et al: Measuring depression outcome with a brief self-report instrument: sensitivity to change of the Patient Health Questionnaire (PHQ-9). Journal of affective disorders 2004; 81:61-66
35. Scott NW, McPherson GC, Ramsay CR, et al: The method of minimization for allocation to clinical trials. a review. Control Clin Trials 2002; 23:662-674
36. Funnell MM, Anderson RM, Arnold MS, et al: Empowerment: an idea whose time has come in diabetes education. The Diabetes educator 1991; 17:37-41
37. Levkoff S,Sanchez H: Lessons learned about minority recruitment and retention from the Centers on Minority Aging and Health Promotion. The Gerontologist 2003; 43:18-26
38. Tsai J, Klee A, Shea N, et al: Training Peer Specialists With Mental Illness in Motivational Interviewing: A Pilot Study. Psychiatric rehabilitation journal 2016;
39. Pistrang N, Jay Z, Gessler S, et al: Telephone peer support for women with gynaecological cancer: benefits and challenges for supporters. Psycho-oncology 2013; 22:886-894
40. Arean PA, Gum A, McCulloch CE, et al: Treatment of depression in low-income older adults. Psychology and aging 2005; 20:601-609
41. Crum RM, Anthony JC, Bassett SS, et al: Population-based norms for the Mini-Mental State Examination by age and educational level. JAMA : the journal of the American Medical Association 1993; 269:2386-2391
42. Folstein MF, Folstein SE,McHugh PR: "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. Journal of psychiatric research 1975; 12:189-198
43. Lowe B, Unutzer J, Callahan CM, et al: Monitoring depression treatment outcomes with the patient health questionnaire-9. Med Care 2004; 42:1194-1201
44. Aguilera A, Schueller SM,Leykin Y: Daily mood ratings via text message as a proxy for clinic based depression assessment. Journal of affective disorders 2015; 175:471-474
45. Tetley A, Jinks M, Huband N, et al: A systematic review of measures of therapeutic engagement in psychosocial and psychological treatment. J Clin Psychol 2011; 67:927-941
46. Howgego IM, Yellowless P, Owen C, et al: The therapeutic alliance: the key to effective patient outcome? A descriptive review of the evidence in community mental health case management. Australian New Zealand Journal of Psychiatry 2003; 37:169-183
47. Priebe S, Richardson M, Coney M, et al: Does the therapeutic alliance predict outcomes of psychiatric treatment in patients with psychosis? A systematic review. Psychotherapy Psychosomatics 2011; 80:70-77
48. Kivlighan Jr. D,Shaughnessy P: Patterns of working alliance development: A typology of client's working alliance ratings. Journal of counseling psychology 1983; 47:362-371
49. Sirey JA, Meyers BS, Teresi JA, et al: The Cornell Service Index as a measure of health service use. Psychiatr Serv 2005; 56:1564-1569
50. Stewart AL, Hays RD,Ware JE, Jr.: The MOS short-form general health survey. Reliability and validity in a patient population. Med Care 1988; 26:724-735

51. Ware JE, Jr.,Sherbourne CD: The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30:473-483
52. Schwarzer R,Jerusalem M: The general self-efficacy scale (GSE). Anxiety, Stress, and Coping 2010; 12:329-345
53. Russell DW: UCLA Loneliness Scale (Version 3): reliability, validity, and factor structure. Journal of personality assessment 1996; 66:20-40
54. Lee H, Roh HS, Yoon JS, et al: Assessment of quality of life and depression in Korean patients with Graves' ophthalmopathy. Korean Journal of Ophthalmology 2010; 24:65-72
55. Norbeck JS: Modification of recent life event questionnaires for use with female respondents. Research in Nursing and Health 1984; 7:61-71
56. Sarason IG, Johnson JH,Siegel JM: Assessing the impact of life changes: Development of the life experiences survey. . Journal of consulting and clinical psychology 1978; 46:932-946
57. Charlson M, Pompei P, Ales K, et al: A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis. 1987; 40:
58. Billioux A, Verlander K, Anthony S, et al: Standardized screening for health-related social needs in clinical settings: the accountable health communities screening tool. NAM perspectives 2017;
59. Laird N,Ware JH: Random-effects models for longitudinal data. Biometrics 1982; 28:964-974
60. Kraemer HC, Kiernan M, Essex M, et al: How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur approaches. Health psychology : official journal of the Division of Health Psychology, American Psychological Association 2008; 27:S101-108
61. Newell J, Yesavage JA, Taylor JL, et al: Sedation mediates part of Citalopram's effect on agitation in Alzheimer's disease. Journal of psychiatric research 2016; 74:17-21
62. Murray DM, Varnell SP,Blitstein JL: Design and analysis of group-randomized trials: a review of recent methodological developments. American journal of public health 2004; 94:423-432