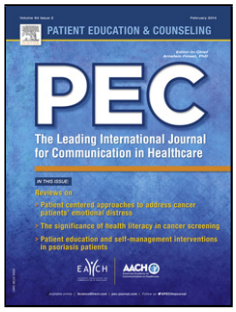
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The Impact of Peer Mentor Communication with Older Adults on Depressive Symptoms and Working Alliance: A Pilot Study

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Authorship

All authors listed participated in the following in the development of this manuscript. Dr. Joo was involved in (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article and revising it critically for important intellectual content, (3) final approval of the version to be submitted. Dr. Gallo was involved in the conception of the study, analysis, interpretation, revision and final approval. Mr. Hwang was involved in analysis, interpretation, revision and final approval. Dr. Roter was involved in (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article and revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Highlights

- We analyzed peer talk in a depression care program for older adults.
- Peers learned communication skills targeted in their training.
- Peers used client-centered and emotionally responsive talk.
- Both communication elements were associated with reducing depression.
- Peers can be a valuable resource when providing depression care.

Abstract

Objective: The objective of this pilot study was to describe peer communication in meetings with depressed elders, associate their relationship with working alliance and depression and assess congruence of communication with training.

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Methods: Three peers with a history depression, in recovery, received 20 hours of training in peer mentoring for depression as part of an 8-week pilot program for 23 depressed older adults. Each peer-client meeting was recorded; a sample of 69 recorded meetings were chosen across the program period and coded with the Roter Interaction Analysis System, a validated medical interaction analysis system. Generalized linear mixed models were used to examine peer mentor talk during meetings in relation to working alliance and client depression.

Results: Peers used a variety of skills congruent with their training including client-centered talk, positive rapport building and emotional responsiveness that remained consistent or increased over time. Client-centered communication and positive rapport were associated with increased working alliance and decreased depressive symptoms (all $p<.001$).

Conclusion: Trained peer mentors can use communication behaviors useful to older adults with depression. Specifically, client-centered talk may be important to include in peer training.

Practice Implications: Peer mentors can be a valuable resource in providing depression counseling to older adults.

Keywords: peer support, communication, training, aging, depression, mental health

1. Introduction

The spreading practice of peer support for mental health is promising, but the evidence-base is only emerging. In the health care setting, peer mentors "who have lived

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it" can share self-management expertise derived from experience to help clients successfully manage their illness on a daily basis (1, 2). Meta-analyses have shown that peer support can decrease depressive symptoms and enhance engagement in mental health services, (3 , 4) although there are few rigorous studies using peers in depression programs for older adults (5, 6). Moreover, despite evidence of a positive impact on depression, empirical studies are lacking regarding how best to train peer mentors to overcome challenges inherent in establishing and sustaining a helping relationship for effective depression care delivery (7, 8). While various theories have been posited to underlie peer support processes, the core components of peer support have not been clearly identified (7, 9, 10).

Davidson et. al. has positioned peer support mid-way on the spectrum of psychological helping relationships with friendship at one end and professional psychotherapy on the other in terms of formality and reciprocity (11). The quality and content of communication significantly impact the value of the helping relationship (9, 11) and factors such as trust and bonding (therapeutic alliance) as well as active listening and empathy are critical aspects of positive social support.

In terms of training, some studies conceptualize the peer as having the requisite communication skills by virtue of their "peerness," and as a result minimal training and supervision are provided (12, 13). Other studies have raised concerns that peer mentors can have difficulty establishing a helping relationship and may use unhelpful communication behaviors such as giving unsolicited advice (14, 15). The lack of clarification of the core components of peer support has contributed to the varying practices in training and supervision in peer interventions (16, 17).

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The few empirical studies of peer communication that exist (18) show that peers can be successfully trained in counseling methods requiring communication skills such as asking open-ended questions, avoiding unsolicited advice and showing empathy (19-22) as well as higher-order, complex counseling behaviors such as reflective listening (20, 23). A challenge evident in one of these studies is that peer use of counseling components may appear to decrease over time, a finding hypothesized to be due to inadequate supervision (23). Some studies using lay workers have suggested that initial training without supervision is insufficient to sustain performance and may result in negative outcomes(13, 24).

The current study was designed to evaluate counseling behaviors used by trained peer mentors in meetings with depressed older adults on working alliance and depressive symptoms. We analyzed audio-recordings as part of Peer Enhanced Depression Care, a feasibility study using older peer mentors who have experienced depression to provide depression care to older adults. The majority of participants in the study were engaged in the peer program as evidenced by high retention rates and experienced reduction in depression. We analyzed audio-recordings of peer mentoring meetings to answer the following questions: 1) do trained peer mentors use the positive social support and counseling skills targeted in their training; 2) do peers vary their use of communication skills over the 8-week mentoring period; 3) is peer communication associated with an increase in bonding and agreement on goals and tasks between client and peer (working alliance), and (4) is peer communication associated with a decrease in clients' depressive symptoms over the mentoring period?

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2. Methods

We analyzed audio-recordings as part of Peer Enhanced Depression Care, a pilot study designed to assess the feasibility of using older peer mentors (50 years of age and older) who have experienced depression and are in recovery to provide one-to-one depression care to older adults. As described in more detail elsewhere, data collection occurred from August 2014 to July 2015. We reported that 90% of clients attended all 8 meetings with the peer mentor and for 85% of clients we found a statistically significant decrease in PHQ-9 scores from 14.7 ± SD 4.4 (mean at baseline) to 7.1 points ± SD 7.1, p-value <0.001 (mean at post-study). Notably, a change of 5 points on the PHQ-9 questionnaire is considered clinically meaningful (25). Working alliance as rated by peers and clients significantly increased over time among clients whose depression improved but did not change appreciably among clients whose depression did not improve. Details of the training model have been published previously (26).

Recruitment of peer and client participants.

We recruited six peer mentors who were 50 years or older, had a history of depression treatment with greater than 5 years in recovery and previous volunteer experiences in mental health. Time in recovery was obtained by self-report. They received 20 hours of initial training and weekly supervision concurrent with client meetings throughout the study. A cohort of six peer mentors was recruited; three participated fully in the study and three dropped out: 2 due to physical illness and 1 due to lack of time.

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Depressed older adults were recruited from community settings (e.g., senior centers and senior buildings, word of mouth) and from other aging studies, were screened by telephone and in-person for eligibility criteria by a research assistant. Persons were eligible for the study if they 1) had clinically significant depressive symptoms as assessed with a standard depression questionnaire (PHQ-9>5), 2) not engaged in specialty mental health care, and 3) aged 50 years or older. Older adults who met criteria were consented to the study and clinically evaluated by a geriatric psychiatrist prior to enrollment.

Training and supervision of peer mentors.

Peer mentors received training and were supervised throughout the study. A geriatric psychiatrist (JJ) conducted 20 hours of training to introduce peer mentors to their role. We reasoned that initial training would allow for initial degree of mastery of communication skills and ongoing supervision concurrent with client meetings would support the continued use of skills by the peer throughout the study.

Training was a practical application of principles related to establishing helping relationships and peer support (27, 28) and focused on four modules: 1) active listening, listening more and talking less; 2) building a strong relationship 3) expressing empathy and providing emotional support, and 4) encouraging change to try something new, for example, attitudinal or behavioral changes such as thinking about a stressful relationship differently or planning activities to decrease social isolation. Techniques which are commonly taught in peer trainings such as problem solving and pursuing pleasurable activities were discussed in lay terms for peers to use informally with clients (28). The

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training emphasized a client-centered approach, "meeting the client where they are" without judgment. Issues of client confidentiality, relationship boundaries, appropriate self-disclosure, not giving medical advice, ethical behavior and client safety were discussed. The trainer and peer mentors discussed active listening as a group and practiced skills in role-play with feedback given on their performance.

Supervision was guided by a working alliance model of supervisory process described by Bordin (29) and focused on bonding and developing mutual agreement on goals and tasks between peer mentor and supervisor. Peer mentors met individually or in groups of 2 for an hour weekly with the supervising psychiatrist (JJ). During these meetings, the peer mentor reported on client progress and shared impressions and insights. The psychiatrist provided modeling, guidance and reinforcement of what was taught during training as well as continued skills development. They worked together to problem-solve challenges presented by the client such as lack of engagement. The supervising psychiatrist was available as needed by telephone to provide support. The research protocol was approved by the Institutional Review Board of Johns Hopkins University School of Medicine.

Data Collection

Demographic information.

Standard questions were used to obtain demographic information on age, level of educational attainment, marital status, ethnicity, medical problems and health service use.

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Number of medical problems, history of counseling, and current antidepressant use were obtained through self-report during the clinical evaluation and baseline assessment.

Depression and Working Alliance.

Depressive symptoms were assessed with the PHQ-9 at pre-and post-study (25). Clients scoring 5 or more on the PHQ-9 received a clinical interview and baseline assessment to evaluate appropriateness for study. The Working Alliance Inventory Short Form (WAI-SF), a questionnaire that assesses bonding and agreement on goals and tasks, was completed by peer mentors and clients after each meeting (30). The range of scores for the WAI-SF is 12 to 84, with higher scores indicating a stronger bond and agreement on tasks and goals.

Roter Interaction Analysis System

Audio-recordings from the peer mentor-client meetings were analyzed with the Roter Interaction Analysis System (RIAS), a widely used and validated quantitative system for analyzing health communication between providers and clients, including applications in counseling and mental health (31-33). The system contains 37 mutually exclusive categories of communication that are grouped to form larger composites that comprise broad conceptual communication domains of instrumental and affective behavior. Recognizing the influence of emotions on cognition and behavior, coders also globally rate the affective tone of the peer mentors and clients across several positive (e.g.

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interest, sympathetic) and negative dimensions (e.g., anxiety, hurriedness) on a scale of 1 (low) -5 (high). RIAS coding reliability averaged 0.85 for both client and peer categories.

Meeting duration, expressed in minutes and client verbal dominance (indicated by a ratio greater than 1) were also collected, reflecting the proportion of total visit statements contributed by the client relative to the peer mentor. As in other studies using the RIAS, client-centered communication was constructed as the ratio of psychosocial and socio-emotional statements in relation to biomedical exchange, with higher values indicating more client-centered interactions (34). RIAS-related communication variables, specifically, client verbal dominance and patient-centered talk have been associated with positive health outcomes such as continuance in care, patient enablement and clinical improvement (35-39).

Table 1 presents core skills that were the focus of training and supervision, the communication categories associated with those core skills and representative quotations taken from recordings of the peer mentor-client meetings. RIAS coded categories are listed in the top portion of the table. In addition to RIAS elements, Table 1 (bottom) presents three core counseling skills, coping, offering perspectives and problem solving, that were operationally defined and tagged by coders to have occurred during meetings.

Analytic strategy

All meetings between peer mentors and study clients were recorded; however because of resource limitations coding was limited to three recordings for each client. From a total of 159 recordings, we selected the first and last meeting as well as a mid-

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course meeting, usually between the 3rd and 5th meeting. In total 69 recordings were RIAS coded and used in the analysis. The purpose of choosing these at set intervals was to assess changes in peer mentor talk over the duration of the 8-week program. The Cochran-Mantel-Haenszel method (i.e., a generalization of Friedman's test) was used to test for statistical significance of the correlation between peer–client visit and repeated measures of RIAS communication variables, stratifying the analysis by client (40). Generalized linear mixed models specified with Poisson distribution and log-link function were used to examine peer mentor talk (mean over all meetings) associated with change in working alliance (completed by client) and separately, with change in client depression. Results were considered statistically significant if the two-sided p-value was less than 0.05. Statistical analyses were performed using SAS, version 9.4 (SAS Institute Inc., Cary, NC).

3. Results

Client and Peer Characteristics

Sociodemographic characteristics of client participants are shown in Table 2. The average age for clients was 68 years and most had a high school education or some college. Clients had mean depressive symptoms in the moderate range (PHQ-9 14.5 ± 4.5). All three peer mentors were women: 2 African American and 1 White woman over 60 years of age with education ranging from 12 to 16 years. All had a history of a mood disorder, were in recovery for more than 5 years and were actively engaged in volunteer work or employed.

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Use of positive social support skills – structure and content of peer talk

Our first goal was to assess whether peer mentors used positive communication skills such as active listening and counseling consistent with their training. As shown in Table 3, clients were verbally dominant, speaking approximately twice as much as peer mentors on average during each meeting, and they tended to be become more verbally dominant over time, although the difference was not statistically significant. While clients talked about the same in meetings over time, the peer mentors talked less, and presumably listened more. The duration of the meetings ranged from 47 to 52 minutes and did not significantly differ over time as reflected in analysis of first, mid and last meetings.

We looked at the content of peer talk as shown in Table 4. The majority of peer talk was focused on four communication behaviors: building rapport, providing emotional support, facilitating talk with clients and providing information and counseling. A high proportion of peer mentor talk was client-centered and peer self-disclosure was frequently used in emotionally responsive talk. Positive global affect was consistently high across all meetings.

Changes in peer talk over time

As noted earlier, client-centered talk is a ratio of psychosocial and socio-emotional statements in relation to biomedical exchange. As shown in Table 4, a high proportion of talk was client-centered and increased significantly over time. Three communication

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behaviors that comprised the majority of peer talk, specifically, emotionally responsive talk, facilitating talk and education and counseling on psychosocial topics remained stable. Rapport building decreased overall, although positive talk such as laughing and showing agreement generally increased. Education and counseling on medical topics decreased over time.

Peer mentors used specified counseling skills (defined as using problem solving, offering differing perspectives and suggesting new coping skills) that were taught during the training program but did so more frequently at the first meeting than in mid-course or at the last meeting.

Association of peer communication with working alliance and depressive symptoms

As shown in Table 5, rapport building such as social talk, use of self-disclosure and client-centered talk were associated with increasing working alliance. Risk ratios greater than 1 indicate that more use of a specific communication behavior increases the chances of improving the outcome while risk ratios less than 1 indicate the opposite.
Greater use of rapport building, reassurance, education and counseling on psychosocial topics and client-centered talk were all significantly associated with reductions in depression.

Provision of medical information was associated with decreased working alliance and worsened depression. Use of self-disclosure was associated with increased working alliance but with worsened depression. Use of identified counseling skills was not associated with working alliance and associated with worsening depression.

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4. Discussion and Conclusion

4.1 Discussion

Peer mentors used communication that reflects core components of the training they received and many of these elements were associated with study measures of therapeutic alliance and depression. We believe that findings reflect intervention success in guiding peer mentors in the delivery of meaningful depression care to older adults congruent with their training, nevertheless, it is important to stress that the reported relationships are correlational in nature and do not suggest causality.

With that caveat, we point out that peer use of client-centered talk and rapport-building were significantly associated with both increased working alliance and improvements in depression, consistent with other findings in the literature (32, 33, 37). Other communication elements had less straightforward relationships with outcomes. Some elements had positive relationships with one and negative relationships with the other, suggesting that outcomes may diverge in terms of correlates and pathways. For example, self-disclosure and back-channeling were positively associated with working alliance, but these same communication elements were associated with worse depression scores. It is possible that peers worked especially hard to build an alliance using self-disclosure and back-channeling when they suspected their clients were at risk of deepening depression; it seems unlikely that use of these skills negatively affected client depression. In terms of self-disclosure on depression, bonding and increased persuasion can occur when self-disclosure is effectively used, (41-43); however, too much self-

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disclosure can be unhelpful for depressed clients if peers talk about their own problems without benefit to the client. Relationships between communication and outcomes are complex, and a beneficial approach to training may be to teach peers about timing and responding to cues as well as mastering particular counseling skills.

Our analysis of changes in communication over the 8-week treatment period was exploratory and findings were, on the whole, encouraging. Use of some communication elements such as emotionally responsive talk and education and counseling were stable and we believe that our strategy of ongoing supervision rather than providing only training was useful in this regard. Several other communication elements did change. For instance, client-centered communication increased while discussion of medical topics and use of specific counseling skills decreased from the first to later meetings. We do not know if these changes were purposeful and reflect flexibility in targeting client needs or the effects of ongoing supervision or not. However, as noted above, client-centered communication was associated with increasing therapeutic alliance and diminished depression, so an increase over time in this type of communication appears positive. Similarly, a reduction in the discussion of medical topics as well as use of specific counseling skills may signal a positive counseling approach given their negative correlation with alliance and depression.

When considered in the context of communication studies of professional health providers, peer talk is similar to communication of counseling professionals in terms of focus on psychosocial and client-centered communication. One difference may be that what characterizes peer talk is less the use of formal counseling skills such as problem solving and greater use of nonspecific and informal counseling skills such as active listening and providing reassurance. As noted above, peers in our study did not use

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specific counseling skills consistently or with great frequency, and use was negatively associated with depression. On the other hand, peers did provide informal counseling on psychosocial topics (counseling defined as suggesting and influencing the client to change unhealthy behaviors) that was associated with improving depression. Persuasion and modeling as described by social cognitive theory as well as provision of emotional and appraisal support may provide a conceptual frame that can be used to inform peer roles and training (44, 45).

Our results are promising; however, our findings must be interpreted in the context of its limitations. First, our findings are correlational in nature so we are unable to infer cause and effect. Second, generalizability is limited due the small number of participants and peers. Third, the three peer mentors who participated in the study may not represent most peer mentors in their ability to learn and practice skilled communication. Training and supervisory processes may need to be tailored to the abilities of trainees which may not be uniform. Fourth, clients and peer mentors may not have spoken frankly during the meetings due to the presence of an audio recorder, which is a common limitation in communication studies. Despite the limitations, our study is notable given that studies of peer communication among minority older adults using older peers and capturing communication over time have not been done. Our study generates useful insights and hypotheses for future studies.

4.2. Conclusion.

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Non-professional peer mentors are able to learn how to listen actively, build strong relationships and counsel informally, components that may be important in providing depression care. Our results are preliminary and a larger study that provides definitive evidence of relationships between peer communication and depression outcomes is needed. Further investigation regarding mediating processes in peer support (eg. specific counseling techniques, modeling based on experience or specific communication skills) could significantly benefit intervention development.

4.3 Practice Implications

Peers are a valuable resource in the delivery of depression counseling to older adults. Healthcare systems are focusing on how to deliver health care to populations and are incentivized to use non-traditional personnel to provide cost-effective health services that engage patients. Peer workers can potentially fulfill this role. They comprise an emerging workforce who are reimbursed for services in many states and are being integrated into health systems into primary clinics where demands for depression care are great but clinical resources inadequate to meet the needs (46, 47). Peer support may be especially relevant for minority older adults who may distrust providers and health systems (48) and better served by approaches that are relationship-based to overcome negative experiences when trying to access mental health services (49, 50). In order to capitalize on healthcare transformation efforts, more evidence-based knowledge regarding peer training, supervision processes and mechanism is needed to guide the spreading practice of peer support.

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Table 1. Core peer skills intervention

Core principles		
1. Active listening: listen more and talk less	**RIAS elements and categories**	**Examples of talk by all peers during the study**
2.Build relationship: make client comfortable during social interaction	• Verbal dominance • Participatory facilitators (asking for client opinion, asking for understanding, restatement of client disclosures, back-channels)	• I forget to ask if it was okay, is it okay? • Mmm-huh. • Does that make sense?
3. Socioemotional support: respond sensitively to a client's emotional distress	• Social talk (nonmedical chitchat) • Positive talk (agreements, jokes, approval, laughter)	• We're just glad to be here with her today. You look pretty today. • Everybody was just so wonderful to meet with.
4. Encourage change: ask client to try a new behavior or problem solving	• Emotionally responsive talk (legitimation, concern, reassurance, empathy, self-disclosure)	• So it's normal that you still miss him and you're still mourning. • If you have one good friend, you're very fortunate.
Specific counseling skills • Engaging in problem solving • Offering different perspective Offering new coping skill	• Education and counseling on psychosocial topics • Education and counseling on medical topics	• What would be nice for you to do is for all those positive and successful things you wrote about yourself- turn them into positive affirmations. • I want to encourage you though to really look for a primary care physician.
•		•

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Table 2. Sociodemographic characteristics of 23 clients and 3 peer mentors in the Peer Mentor Study (2014-2015). Numbers in parentheses are row percentages except for age for which mean and standard deviation are provided

Client characteristics	
Age in years (mean ± standard deviation)	**n (%)**
Women	68.0 ± 6.4 years
Ethnicity	20 (87.0)
Black or African American	
White	17 (73.9)
Education	6 (26.1)
1-4 years of high school or GED	
1-3 years of community college or technical school	8 (34.8)
4 years of college or more	10 (43.5)
Marital status	5 (21.7)
Married	
Divorce/Separated/Widowed	7 (30.4)
Not married but living with partner	14 (60.9)
Total medical problems	2 (8.7)
0	
1-2	1 (4.3)
≥3	8 (34.8)
Baseline PHQ-9 score (mean ± standard deviation)	14 (60.9)
History of depression	14.5 ± 4.5
History of professional counseling	18 (78.3)
Taking antidepressants currently	12 (52.2)

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Table 3. Structural characteristics

Duration of meetings (mean ± SD, min)	**Beginning (N = 23, Obs = 23)**	**Middle (N = 23, Obs = 23)**	**End (N = 23, Obs = 23)**	**P[a]**
All client talk (mean ± SD)	51.5 ± 14.8	46.5 ± 13.6	48.3 ± 15.5	0.40
All peer mentor talk (mean ± SD)	706 ± 293	663 ± 269	672 ± 267	0.74
Ratio of client/peer talk	363 ± 152	288 ± 113	291 ± 109	**0.04**
[a] The statistical significance of individual variables was assessed with the Cochran-Mantel-Haenszel χ^2 tests with df = 2.	1.95	2.31	2.31	0.08

Within-peer clustering was not taken into account in the statistical test.

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Table 4. Peer mentor talk

	Beginning	Middle	End	
Categories of talk	**Mean Count (%)**	**Mean Count (%)**	**Mean Count (%)**	**P[a]**
Ask questions, medical and psychosocial	20.4 (5.6)	17.1 (6.0)	17.6 (6.1)	0.79
Rapport building	65.7 (18.1)	64.7 (22.5)	58.2 (20.0)	**<0.001**
Social talk	10.5 (2.9)	9.1 (3.2)	8.1 (2.8)	0.2
Positive talk	55.2 (15.2)	55.6 (19.3)	50.1 (17.2)	**<0.001**
Laughs, tells jokes	20.9 (5.8)	24.0 (8.3)	21.8 (7.5)	**<0.001**
Shows agreement, understanding	22.3 (6.2)	22.3 (7.8)	21.9 (7.5)	**0.008**
Emotionally responsive talk	105.3 (29.0)	70.8 (24.6)	72.6 (25.0)	0.13
Reassurance, optimism	21.4 (5.9)	17.3 (6.0)	17.2 (5.9)	0.41
Self-disclosure	67.0 (18.5)	40.6 (14.1)	41.2 (14.2)	0.29
Facilitating client talk	78.3 (21.6)	66.4 (23.1)	71.7 (24.7)	0.45
Back-channels	56.6 (15.6)	48.0 (16.7)	55.1 (19.0)	**0.05**
Paraphrase, checks for understanding	17.0 (4.7)	14.0 (4.9)	12.9 (4.4)	0.34
Education and counseling	82.4 (22.7)	59.1 (20.6)	62.2 (21.4)	**0.02**
Medical topics	14.0 (3.9)	8.7 (3.0)	7.0 (2.4)	**<0.001**
Lifestyle and psychosocial topics	68.4 (18.9)	50.4 (17.5)	55.2 (19.0)	0.08
Identified counseling skills	13.8	9.3	9.7	**0.02**
Engages in problem solving	1.1	0.8	1.0	0.78
Offers a different perspective	4.3	3.6	3.3	0.40
Offers new coping skill	8.4	4.9	5.4	**0.03**
Global affect				
Positive, mean	5.2	5.2	5.1	0.98
Negative, mean	2.0	2.0	2.0	0.99
Client-centered communication (mean ± SD)	22.2 ± 23.0	47.6 ± 55.7	42.1 ± 65.9	**<0.001**

[a] Poisson regression model with adjustment for all peer mentor's talk at each meeting and within peer-clustering was used. indicate an association with worsening depression and alliance scores. b. Higher risk ratios indicate improvements in depression and alliance while lower ratios indicate an association with worsening depression and alliance scores.

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Table 5. Peer mentor talk and outcomes

		Change in working alliance		Change in depression	
	Overall	completed by client		of client	
	Mean ± SD	Risk Ratio (95% CI)		Risk Ratio (95% CI)	
Categories of talk	**(N = 23, Obs = 69)**	**Unit = 1**	**P[a]**	**Unit = 5**	**P[a]**
Ask questions, medical and psychosocial	18.4 ± 11.7	0.99 (0.98-1.00)	**0.02**	0.94 (0.90-0.99)	**0.02**
Rapport building	62.8 ± 32.5	1.01 (1.01-1.02)	**<0.001**	1.07 (1.04-1.10)	**<0.001**
Social talk	9.2 ± 17.8	1.04 (1.03-1.06)	**<0.001**	1.28 (1.19-1.38)	**<0.001**
Positive talk	53.6 ± 23.9	1.01 (1.00-1.01)	**0.02**	1.04 (1.01-1.07)	**0.01**
Emotionally responsive talk	82.9 ± 55.1	1.01 (1.01-1.02)	**<0.001**	0.98 (0.95-1.00)	0.08
Reassurance, optimism	18.6 ± 10.0	1.00 (0.99-1.01)	0.9	1.07 (1.02-1.13)	**0.007**
Self-disclosure	49.6 ± 46.3	1.03 (1.02-1.03)	**<0.001**	0.93 (0.90-0.96)	**<0.001**
Facilitating client talk	72.2 ± 51.5	1.00 (1.00-1.01)	0.24	0.93 (0.90-0.95)	**<0.001**
Back-channels	53.2 ± 49.9	1.01 (1.00-1.02)	**0.006**	0.93 (0.91-0.96)	**<0.001**
Paraphrase, checks for understanding	14.7 ± 7.6	1.00 (0.99-1.01)	0.74	0.90 (0.85-0.95)	**<0.001**
Education and counseling	67.9 ± 39.5	0.99 (0.98-0.99)	**<0.001**	1.03 (1.00-1.05)	0.07
Medical topics	9.9 ± 9.7	0.96 (0.95-0.97)	**<0.001**	0.88 (0.82-0.94)	**<0.001**
Lifestyle and psychosocial topics	58.0 ± 36.5	1.00 (0.99-1.00)	0.12	1.05 (1.02-1.09)	**<0.001**
Identified counseling skills	10.9 ± 8.4	1.00 (0.98-1.01)	0.55	0.93 (0.87-0.99)	**0.03**
Global affect					
Positive, mean	5.2 ± 0.5	1.01 (0.99-1.02)	0.43	1.01 (0.92-1.11)	0.8
Negative, mean	2.0 ± 0.1	1.00 (0.98-1.02)	0.93	1.01 (0.87-1.17)	0.9
Client-centered communication (mean ± SD)	37.3 ± 51.9	1.03 (1.03-1.04)	**<0.001**	1.37 (1.32-1.42)	**<0.001**

* Poisson regression was used with adjustment for all peer mentor's talk at each meeting and random effects for time nested within peer mentors.
* Components of identified counseling skills category are not shown due to low frequencies.