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Patterns and Predictors of Engagement in Peer Support Among Homeless Veterans With Mental Health Conditions and Substance Use Histories

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Objectives: Patterns and predictors of engagement in peer support services were examined among 50 previously homeless veterans with co-occurring mental health conditions and substance use histories receiving services from the Veterans Health Administration supported housing program. **Method:** Veteran peer specialists were trained to deliver sessions focusing on mental health and substance use recovery to veterans for an intended 1-hr weekly contact over 9 months. Trajectories of peer engagement over the study's duration are summarized. A mixed-effects log-linear model of the rate of peer engagement is tested with three sets of covariates representing characteristics of the veterans. These sets were demographics, mental health and substance use status, and indicators of community participation and support. **Results:** Data indicate that veterans engaged with peers about once per month rather than the intended once per week. However, frequency of contacts varied greatly. The best predictor of engagement was time, with most contacts occurring within the first 6 months. No other veteran characteristic was a statistically significant predictor of engagement. Older veterans tended to have higher rates of engagement with peer supporters. **Conclusions and Implications for Practice:** Planners of peer support services could consider yardsticks of monthly services up to 6 months. Peer support services need a flexible strategy with varying levels of intensity according to need. Peer support services will need to be tailored to better engage younger veterans. Future research should consider other sources of variation in engagement with peer support such as characteristics of the peer supporters and service content and setting.

Keywords: peer support, engagement, mental illness, substance use, veterans

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Peer support (PS) for individuals with mental health conditions is one of the 10 recovery components defined by the Substance Abuse and Mental Health Services Administration (SAMSHA, 2012). Defined by SAMSHA (2016) as “a person who uses his or her lived experience of recovery from mental illness and/or addiction, plus skills learned in formal training, to deliver services in behavioral health settings to promote mind-body recovery and resilience,” PS services have been widely adopted in recovery-oriented behavioral health systems (Blash, Chan, & Chapman, 2015). In the Veterans Health Administration (VHA), about 1,100 “peer specialists” have been hired nationwide to support veterans with a range of behavioral health conditions—possibly making the VHA the single largest employer of mental health PS workers (Chinman, Salzer, & O’Brien-Mazza, 2012).

Despite the increasing use of peer supporters in behavioral health services, research to date has yielded only moderate evidence of their effectiveness (Chinman et al., 2014; Doughty & Tse, 2005; Lloyd-Evans et al., 2014; Repper & Carter, 2011). Moreover, because these outcome studies largely have not indicated what intensity of PS was actually delivered or how much PS seemed necessary to have an impact, they provide little indication of the potential for PS services. It is therefore important to study both the extent of engagement with PS services and the predictors of that engagement to lay the foundation for more effective PS services and more powerful treatment-outcome trials.

A few studies have tracked the amount and type of services that peer supporters deliver or that participants receive. For example, Paulson et al. (1999) had peer supporters complete activity logs about their service delivery. Eisen et al. (2012) documented the attendance of veterans with serious mental illness in peer-led group recovery sessions and found that veterans attended on average only one third of possible sessions. Sledge et al. (2011) reported the number of contacts and hours of contact that peer supporters had with persons with mental health conditions in an effectiveness study and tested the impact of amount of contact. They found that amount of contact was not associated with likelihood of hospitalization. We found no study that attempted to predict the frequency and intensity of engagement in PS services based on recipient characteristics.

Given the paucity of research on engagement with peer supporters, the related literature on mental health service utilization was examined. Research on use of outpatient mental health services has identified several sociodemographic characteristics that tend to be associated with lesser engagement: younger age, Hispanic ethnicity, lower socioeconomic status, and homelessness (Carpenter, Morrow, Del Gaudio, & Ritzler, 1981; Chen, 1991; Kruse, Rohland, & Wu, 2002; Nicholson, 1994).

Research indicates that co-occurring addiction and mental illness result in increased rates of relapse, treatment dropout, poor community integration, and a higher utilization of costly services such as emergency rooms and inpatient units (Kranzler, Kadden, Babor, Tennen, & Rounsaville, 1996; Nunes & Quitkin, 1997; Rounsaville, Dolinsky, Babor, & Meyer, 1987). As well, the independent influence of support was identified as a key influence on patterns of help-seeking for health and mental health problems (Pescosolido, 1992).

Study Aims

The research aims of this article are (a) to describe the patterns and intensity of engagement with PS services and (b) to identify the characteristics of veterans who are more or less likely to engage in PS services. Based on prior related research, we hypothesize that less engagement with PS services will be predicted by younger age, minority racial status, greater homelessness history, less education, more symptoms of mental illness and substance use, and lower levels of community participation and support. By seeking to identify such predictors of engagement, we are following the advice of Hohmann and Shear (2002) to identify racial, cultural, and other sources of the acceptability of interventions. Armed with this knowledge, it may be possible to better tailor peer services to particular groups and thereby improve engagement and ultimately outcomes.

Method

Research Design and Participants

The current study included the first 50 veterans participating in the intervention arm of an intended sample of 90 participants in a randomized, longitudinal, two-site study (Bedford Massachusetts and Pittsburgh Veterans Hospitals) of PS services’ impact on housing retention and community functioning. The veterans had been previously homeless, were enrolled in the Department of Housing and Urban Development—Veterans Health Administration Supportive Housing Program (HUD/VASH) program, and were identified by case managers or medical records as having a history of using alcohol and/or drugs and serious mental illness. The HUD/VASH program provides federally funded Section 8 housing vouchers that pay the cost of community-based housing rentals above 30% of their gross income to eligible veterans; veterans in HUD/VASH also receive case management through the VHA. Half the total sample in this study was randomized to receive PS services in addition to HUD/VASH services. This study included all veterans who had completed the 9 months of intended treatment from study startup through November 2015, accounting for over 50% of the target sample of 90.

The Peer Support Intervention

At each site, the intervention consisted of meetings between veterans housed in HUD/VASH and a full-time, trained veteran peer supporter who had a similar history of prior homelessness, substance use, and mental illness but was in recovery. Three peer supporters were employed by the VHA hospitals to deliver services to the veterans in this study. The peers were roughly matched to the sample mean characteristics in terms of race, education, marital status, and age. Each peer supporter sought to meet with each veteran on his or her caseload for 1 hr each week for up to 9 months. Caseloads were capped at 15. Although weekly meetings were the goal, the actual frequency of visits and the length of the intervention were ultimately determined by the veteran participant. Using principles of supported employment (Bond, 1998), the intensity of services varied according to need, allowing more frequent meetings to deal with critical events (e.g., court proceedings) or less when veterans did not perceive a need for meetings.

Veterans could also suspend visits for a period of time and then choose to resume visits or to discontinue completely.

Over the 9 months, the intervention was designed to provide mental health and substance use recovery and community integration skills using a 50/50 mix of “structured” and “unstructured” meetings. Structured meetings were when the peer supporter used preplanned, recovery-oriented discussion topics and prompts with the veterans. This content was derived from an evidence-based treatment program designed specifically for homeless veterans with co-occurring substance use and mental health conditions, called MISSION-Vet. We adapted nine self-guided structured exercises with worksheets from the MISSION-Vet treatment manual (Smelson, Sawh, Kane, Kuhn, & Ziedonis, 2011) and 11 “structured peer-led sessions” from the MISSION-Vet consumer workbook (Smelson et al., 2011). Table 1 displays the topics of the 20 structured sessions that peers were expected to complete with veterans during visits. Each session had background information, structured questions for discussion, worksheets, and examples. Unstructured sessions occurred when the peer met with veterans and focused on concerns expressed by the veteran in a way that would assist their recovery without a planned agenda.

The peer supporters at both sites were supervised weekly by a clinician with extensive experience supervising peers. Monthly, the two peers and two supervisors met as a group by conference call. Fidelity to the intervention was assessed through supervision and with a tracking sheet and checklist that kept a record of the number and type of structured and unstructured sessions and exercises delivered.

Engagement Strategies

Peer supporters were community based, meaning that they traveled to meet with veterans at their homes and communities or at the VHA hospital if such visits were convenient for the veteran.

Unstructured sessions were intended as trust-building and problem-solving sessions that were tailored to the immediate concerns and needs of the veteran and thus were an important engagement strategy. Peers were trained in assertive outreach strategies such as continued attempts to make telephone and in-person contacts, tolerance for missed appointments, and continued attempts to engage and establish trusting relationships. A monetized incentive for peer sessions (\$5 gift card) was also provided to encourage the veteran to “give it a try,” so that a relationship could form.

Measures

Demographic characteristics and substance use and mental health status were assessed at baseline. Alcohol and drug use and use of 12-step programs were measured with questions from the Addiction Severity Index, a standardized, widely used clinical research instrument with considerable evidence of concurrent reliability and discriminant validity among individuals with substance use and psychiatric disorders (McLellan et al., 1992; McLellan, Luborsky, Woody, & O’Brien, 1980). Current symptoms were measured with the 24-item Behavior and Symptom Identification Scale (BASIS-24), a widely used, highly reliable, and valid multidimensional mental health assessment instrument (Eisen, Gerena, Ranganathan, Esch, & Idiculla, 2006; Eisen, Normand, Belanger, Spiro, & Esch, 2004; Fasoli, Glickman, & Eisen, 2010). Each BASIS item uses a Likert scale of 1–4 to measure symptoms, with higher scores indicating more symptoms. The depression subscale assesses depression and anxiety symptoms. The interpersonal relationships subscale evaluates the client’s perception of the quality of his or her interpersonal experiences with family and others. The psychosis subscale assesses four symptoms of psychotic disorders, such as hallucinations and delusions. The substance use subscale seeks information regarding the client’s urge to drink or use drugs as well as possible problems resulting

Table 1
Topics of Structured Sessions of Peer Support

Topic	MISSION-Vet consumer workbook	MISSION-Vet treatment manual
Willingness	X	
Self-acceptance and respect	X	
Gratitude	X	
Humility	X	
Dealing with frustration	X	
Handling painful situations	X	
Significance of honesty	X	
Courage	X	
Patience	X	
Medicine maintenance	X	
Making a good thing last	X	
Scheduling activities in early recovery		X
Life problem area		X
The life you want		X
Developing a personal recovery plan		X
Relapse prevention		X
Coping with stress and stress strategies		X
Orientation to 12-step programs		X
Changing unhealthy thinking patterns		X
PTSD and relaxation or anger management		X

Note. PTSD = posttraumatic stress disorder; X = present in manual.

from alcohol and/or drug use. The emotional lability subscale includes three items reflecting mood swings, racing thoughts, and feeling short-tempered. With the exception of the BASIS substance use symptom index, scale reliabilities (Cronbach’s alpha) were .7 or higher. The Temple University Community Participation Measure (Salzer, Kottsieper, & Brusilovskiy, 2015) assesses the frequency of 26 community activities (e.g., going to the movies, visit with family or friends) in the past month. The resulting total score for all activities tallies those activities in which the participant endorsed having spent any time. Attendance at 12-step meetings (e.g., Alcohol Anonymous) in the past month was distinguished as a yes/no dichotomy.

The measure for engagement with PS services is based on contact data recorded by each peer in a daily activity log, reviewed in weekly supervisory meetings. Due to turnover in project peers during the early stages of the project, there were periods during which veterans who were enrolled in the treatment condition could not engage with a peer supporter. Therefore, engagement in services was operationalized as the frequency of encounters with the project peer supporter, acknowledging the total number of days the peer was available for engagement in our analyses. PS sessions counted for this analysis included any in-person visit, as well as phone calls of at least 20 min—a threshold that was believed to allow for more contact than simply scheduling future meetings. There were fewer than 10 missing data points for the variables measured at baseline; values for these measures were imputed using regression imputation.

Analysis

To describe the pattern of engagement, we computed the mean frequency of weekly contacts per 28-day period of PS service for

the duration each veteran was involved in the study. We chose 28-day intervals to focus on overall trends and avoid idiosyncratic day-to-day or weekly variation. We summarized trajectories of PS engagement over the study duration in graphical form with a spaghetti plot (Allen, 2010; see Figure 1). The contact frequency over a 28-day period was defined as the number of times the veteran and the peer met (or had a phone call lasting at least 20 min) divided by the number of days in the 28-day period the peer was available to meet (usually 20 because the PSs were typically not available on weekends). This rate was rescaled by a factor of 5 so that the reported frequency was the rate of contacts per 5-day workweek. The computed rate was plotted on the graph at the midpoint of the 28-day period. To smooth the resulting plot, the start and end date of each period was designated to overlap by 14 days with the adjacent periods (rates were calculated over Days 1–28, 15–42, 29–56, etc., and were plotted against Day 15, 29, 43, etc.). The trajectories in the spaghetti plot in Figure 1 picture the rates of peer contact frequencies over time per veteran.

Our analysis examines the significance of variables in stages via likelihood ratio chi-squared tests, within the three groupings of the hypotheses: veteran demographics, mental health and substance use, and community participation and support. Although there were many covariates modeled relative to the *N* of 50, we are able to include these many due to the very large number of contacts (over 600). Since an individual veteran’s rate of engagement may have varied over time, we fitted rate of engagement with a mixed-effects log-linear model. The use of a log-linear model is appropriate for modeling frequencies of counts, such as our measure of number of contacts over a specified interval of time. The model assumes that the logarithm of the mean engagement rate depends linearly on the baseline measures. The mixed-effects

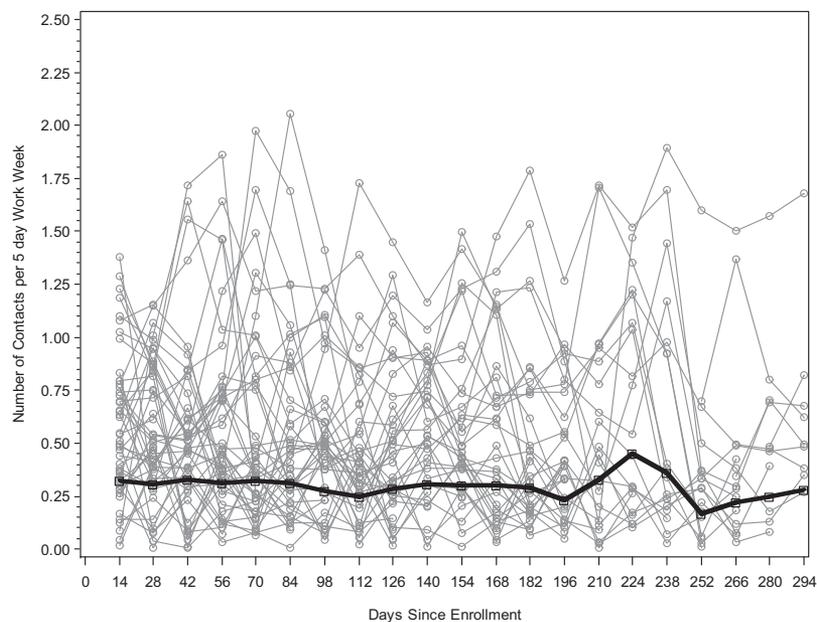


Figure 1. Trajectory rates of per-veteran peer contacts. Trajectories of rates of per-veteran peer contacts per 5-day workweek over a 28-day period (assuming peer availability for all 5 workdays). The darker line through the middle traces the average contact frequencies per 14-day period.

component of the model addresses the possibility that individuals may have had different engagement frequencies over the duration of the study beyond that captured by baseline covariates. More specifically, for each veteran, the outcome was the count of the number of contacts with a study peer supporter within successive nonoverlapping 28-day periods.

Covariates in the log-linear model included baseline health and demographic variables. Time, recorded as the number of the 28-day period after enrollment, was included in the model as linear and squared terms, with the squared term centered at the mean of the period data to avoid collinearity in the linear and squared time term. The significance of individual terms was calculated using z tests.

We checked for baseline variable collinearity among selected variables by assessing the magnitude of variance inflation factors (VIFs; Kutner, Nachtsheim, & Neter, 2004). Variables evidencing VIF values greater than 10 were considered problematic and were selectively eliminated from the variable list. These included alternate measures of employment and homelessness.

Results

Sample Characteristics

The distributions of key demographic, mental health and substance use, and community participation and support characteris-

tics used in our modeling are indicated in Table 2. There were slightly more African Americans than Whites. Most of the veterans were unmarried, were unemployed, and had some postsecondary education or training and an average age of 55 years (range, 23–64). More than half of the sample had spent over a year homeless in their lifetime. The BASIS overall score reflected an overall little-to-moderate level of mental health challenges and symptoms, with the highest mean on the emotional lability subscale, followed by depression. A third of the sample reported that they had used drugs in the past 30 days, and 14% drank to intoxication in the past 30 days. Although half of the veterans had attended a 12-step meeting in the past month, the indicator of community participation suggested a deficit. Veterans engaged in 7.26 activities per month as measured by the Community Participation Scale (range, 0–16 out of the 26 possible activities).

Engagement Pattern and Intensity

The raw mean number of sessions that veterans engaged with peer supporters was 9 (range, 0–39) out of a potential of 40 weekly sessions. Figure 1 presents the spaghetti plot of the rates of veteran PS sessions over the 9 months averaged over 28-day intervals. Numbers above the projected total of weekly sessions reflect veterans who had more than one contact per week. The bolded line shows the mean trajectory of veterans' PS sessions. The average

Table 2
Sociodemographic Characteristics at Baseline (N = 50)

Variable	Percentage (n)	Mean (SD)	Range
Gender			
Male	92 (46)		
Marital status			
Not married	90 (45)		
Vocational engagement			
Unemployed past 30 days	72 (36)		
Student past 30 days	8 (4)		
Age grouping			
0–30 years	4 (2)		
31–50 years	14 (7)		
51–60 years	66 (33)		
61+ years	16 (8)		
Education			
High school or less	38 (19)		
Tech/vocational training, some college	62 (31)		
Race			
White	42 (21)		
African American	48 (24)		
Other	10 (5)		
Length of lifetime homelessness			
<1 year	44 (22)		
1–9 years	34 (17)		
>9 years	20 (10)		
Mental health and substance use			
BASIS overall score		1.24 (.586)	.24–2.12
BASIS subscale—depression		1.32 (.834)	.0–2.83
BASIS subscale—emotional lability		1.61 (.942)	.0–4.00
BASIS subscale—interpersonal relationships		1.18 (.791)	.0–3.9
BASIS subscale—psychotic symptoms		.655 (.862)	.0–2.84
BASIS subscale—substance use		.572 (.652)	.0–2.54
Substance use past 30 days			
Any drug use (cannabis included)	36 (18)		
Alcohol to intoxication	14 (7)		
Community participation and support			
Attended a 12-step group past 30 days	50 (25)		
Count of community activities past 30 days		7.26 (3.61)	0–16

Note. BASIS = Behavior and Symptom Identification Scale.

rate of engagement per 5-day workweek (over 28-day periods) is .30, indicating that engagement was a little less than once per month rather than the intended once per week. Five-day workweek rates of contact over 28 days ranged from zero to a high of 2.12, indicating that for some periods, there were no contacts, and at times contacts were as frequent as more than twice a week. We note that there is substantial variation in the rates of engagement, overall as well as for any one veteran over time. Most peer sessions occur within the first 6 months. The overall pattern displayed is of slowly decreasing rates over the first 200 days from roughly 0.35 contacts per 5-day week to 0.25 contacts per 5-day week. There is considerable drop-off of contacts over time, and many veterans had no contacts past the 6-month mark. The fluctuation in the average engagement line beyond 200 days was most likely due to small sample size random variation at this point.

Predictors of Engagement With Peer Supporters

Results for the modeling of predictors of engagement with peers are presented in Table 3. Demographic variables were the first block entered and included age, race, marital status, employment or student status, and lifetime homelessness. The second block entered comprised mental health and substance use scores from the Addiction Severity Index and all the BASIS subscales. The last block included the community participation and support indicators of the Temple University Community Participation Scale and 12-step meeting attendance.

The coefficients for time lapsed (28-day linear and 28-day quadratic) indicate that engagement declined significantly over time at a slow but accelerating rate. Engagement tended to increase with older age, although this effect was weakened by addition of the community participation and support block. No other characteristic was a statistically significant independent predictor of engagement, but there was a trend in the final model of increased engagement with more psychotic symptoms and 12-step program attendance.

Discussion and Implications for Practice

We note that at this point in the project, the average rate of contacts was substantially less than what was intended (.30 rather than 1.0, or about once per month rather than once per week). This intensity of engagement is similar to the finding of Eisen et al. (2012), in which only one third of peer-led sessions were attended. This may be an important finding relevant for future planning of PS caseload sizes. Even when weekly community-based services are available, with intensive outreach and monetized incentives, veterans with co-occurring conditions and previous homelessness may only engage monthly. Alternatively, this low rate of engagement may be interpreted as leaving considerable room for improvement with PS services.

The widely varying rates of engagement, from zero to two times a week, indicate that adoption of a flexible strategy for service delivery is necessary. Like supported employment, this should

Table 3
Engagement With Peer Sessions by Successively Complex Models of Demographic Characteristics, Mental Health and Substance Use Conditions, and Community Participation and Support

Variable	Model 1: demographics coefficients	Model 2: mental health and substance use coefficients	Model 3: community participation and support coefficients
28-day period—linear	-1.385***	-1.380***	-1.378***
28-day period—quadratic	-.877***	-.881***	-.887***
Age 31–50 (referent: under age 30)	2.351	1.426	1.343
Age 51–60 (referent: under age 30)	3.981*	3.867†	3.666†
Age 61+ (referent: under age 30)	4.670*	4.310*	3.821†
Gender, female (referent: male)	1.409	1.111	1.249
Employed (referent: unemployed)	-.678	-.776	-.912
Student (referent: not in school)	-.520	-.234	-.671
Race = African American (referent: White race)	-.112	-.348	-.397
Race = other (non-African American, referent: White)	-.132	-1.269	-1.515
Education = more than high school (referent: less than high school)	.349	.061	.059
Married status (referent: not married)	-.850	-.762	-1.268
Total lifetime homelessness (1–9 years) (referent: less than 1 year)	-.292	-.525	-.621
Total lifetime homelessness (more than 9 years) (referent: less than 1 year)	.283	.277	.010
Drug use (referent: no drug use)		.218	.169
Alcohol use to intoxication (referent: no use)		-.347	-.083
BASIS—depression		.168	.161
BASIS—interpersonal relationship		-.157	-.256
BASIS—emotional lability		-.059	-.072
BASIS—psychotic symptoms		.650	.784†
BASIS—substance use		-.124	-.161
Community Participation Scale			.003
12-Step attendance			.889†

Note. BASIS = Behavior and Symptom Identification Scale.
† $p < .1$. * $p < .05$. *** $p < .001$.

allow for varying intensity over time, including gaps in service delivery, and in correspondence with veteran choice and need. We also note the slowly decreasing engagement over time and the drop-off of engagement for most after 6 months, which may indicate a minimum expectation for the duration of PS services.

This study attempted to shed light not only on the pattern and intensity of engagement but also on who is more likely to engage. The lower engagement rates found may have to do with the complexity of the population that is being served, that is, veterans previously homeless with co-occurring mental illness and histories of substance use. That older veterans are more likely to engage with peer supporters may suggest that they had more needs or that they were more amenable to PS services. This finding also corresponds with other research on the relatively poor engagement of younger people with mental health services and suggests that future PS services may need to be tailored to better engage younger veterans. The suggestion that engagement may have been predicted by reports of psychotic symptoms may indicate that these veterans recognized a greater need for support, whereas the suggestion of more engagement by those more involved with 12-step programs may indicate the effect of a generalized more positive orientation to help-seeking.

Even more important are the many potential predictors that were unrelated to frequency of engagement. It seems likely that the key to explaining variation in engagement with PS services is not primarily the characteristics of the service recipient, but the characteristics of the peer specialists and the setting. Future research should seek other sources of variation in engagement such as the characteristics of the PSs, the quality of the services delivered, and the settings. Additional analysis is also needed to assess whether intensity of engagement is related to outcomes.

Certain limitations to this analysis should be noted. First, a structured diagnostic assessment for determining whether the mental health and substance use eligibility criteria were met was not used, nor was included objective measures based on clinical tests or observed use or impairment. Although the assessments administered are tested and widely used, they are only based on counts of self-reported symptoms and so may be limited by underreporting or “inaccurate” reporting (Goldfinger et al., 1996). Also, this sample of 50 veterans is relatively small; larger studies will be needed to increase confidence in the conclusions. Another important caveat is that veterans were offered a small incentive (\$5.00) to meet with the peers, which is unlikely to be available in many service settings. However, anecdotal reports from the peer supporters suggest that the money did not have a significant impact on participation. We also note that this analysis was undertaken midway through the study, while the peer supporters were still trying out various engagement strategies, and so the findings should be considered provisional. Future analysis with a more stable engagement protocol is needed to determine the upper limits for engagement with peer supporters and to distinguish levels of engagement in and effects of structured and unstructured sessions.

Conclusion

This article is one of the first attempts to predict level of engagement with PS services. Adaptation of PS services is particularly needed to better engage younger veterans. Additional creative engagement strategies may be warranted in future designs of

PS services. Future investigations of engagement could focus on characteristics of the peer provider and the quality of the services rather than the individual characteristics of the service recipient.

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