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A Pilot Test of a Peer Navigator Intervention for Improving the Health of Individuals with Serious Mental Illness

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Abstract Individuals with serious mental illness (SMI) are at considerably higher risk for morbidity and mortality than those in the general population. The current pilot trial is a preliminary examination of a peer health navigation intervention for improving health and healthcare utilization called the Bridge. Twenty-four individuals with SMI were randomly assigned to either peer navigation or treatment as usual (TAU). Navigators encouraged development of self-management of healthcare through a series of psychoeducation and behavioral strategies. Outcomes included a range of health consequences, as well as health utilization indices. After 6 months, compared to the TAU group, participants receiving the intervention experienced fewer pain and health symptoms. Participants changed their orientation about seeking care to a primary care provider (44.4 % vs. 83.3 %, $\chi^2 = 3.50$, $p < .05$) rather than the emergency room (55.6 % vs. 0 %, $\chi^2 = 8.75$, $p < .01$). Therefore, the Bridge intervention demonstrated considerable promise through positively impacting health and healthcare utilization.

Keywords Serious mental illness · Navigation · Integrated care · Intervention

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Introduction

The mortality rate among people with Serious Mental Illness (SMI) is 2–3 times that of the general population (Chang et al. 2010; De Hert et al. 2011; Bazelon Center for Mental Health Law [BCMHL] 2004), meaning that those with a serious mental illness die, on average, 25 years earlier than those without an SMI (Chang et al. 2010; Parks et al. 2006). These deaths are largely attributed to preventable medical conditions (Parks et al. 2006), many of which are more common in the SMI population (De Hert et al. 2011). Morbidity studies of the SMI population have found higher incidence rates of numerous physical disorders, including diabetes (Dickerson et al. 2006; Lester et al. 2005), metabolic and cardio-vascular problems (Brunero and Lamont 2010; Deakin et al. 2010; Filik et al. 2006), obesity (De Hert et al. 2011; Parks et al. 2006), high cholesterol, dyslipidemia (Dalmau et al. 1997), respiratory problems (Filik et al. 2006), sexual dysfunction (De Hert et al. 2011) and cancer (Osborn et al. 2007) in comparison to the general population. In order to effectively treat these highly prevalent physical health issues, which are frequently complicated by the symptoms and treatment of their mental health issues, access and effective use of health care services need to be improved among this population (Brekke et al. 2013).

One of the major barriers to the effective coordination of SMI clients' mental and physical health care is the existence of two distinct systems of care which has resulted in system bifurcation. Due to the lack of coordination across these physical and mental health care systems, those with SMI often have poorer access to care, underutilization or inappropriate use of physical health services, low follow-up rates, decreased service quality, and increased use of emergency services and health care costs (Hackman et al.

2006; Lieberman and Coburn 1986). Integration of health and mental health services has been proposed as a viable strategy to address the fragmentation of the health and mental health care systems (Anderson and Knickman 2001; Druss et al. 2008; Goldberg 1999; Kilbourne et al. 2008). One integration approach is to provide co-situated care, where health providers are embedded within mental health agencies or mental and physical health services are provided within a single agency (BCMHL 2004). However, numerous structural and financial barriers, and changes required by these approaches to facilitate integration, can make them quite prohibitive in practice (Goldberg 1999). Alternatively, a "care-linkage" approach, wherein mental and health providers collaborate while remaining distinct agencies, is advantaged in that it does not require complex restructuring of current financing and service structure arrangements.

Within healthcare linkage models, patient navigators have been utilized to assist clients in a broad spectrum of activities, such as assessment, screening, education, support and coordination of care, in order to streamline and optimize care (Pedersen and Hack 2010; Wells et al. 2008). The successes of patient navigator interventions make them a natural choice to provide care-linkage across systems. For example, a recent randomized controlled trial, using a nurse case manager to link independent mental health and health services, found that individuals with serious mental illness receiving a care linkage intervention evidenced increased utilization of primary care services, increased preventive care visits, and better health outcomes (Druss et al. 2010a). However, employing highly paid professionals as care linkage agents may also prove cost prohibitive, a major issue for sustained adoption in practice, which suggests that fiscally sound alternatives are needed.

Peers, or persons who have shared an illness history, have increasingly been recognized as a viable alternative to healthcare professionals for providing the linkage between mental and health care services (President's New Freedom Commission on Mental Illness 2003). Peers are considered attractive assistants to provide healthcare linkage as their experiences may allow them to be uniquely empathetic and aware of the needs of those suffering from illness. In fact, there is a strong tradition of peer providers being utilized among those with cancer, HIV, and mental illness to provide interventions that facilitate recovery and wellness in a diverse set of clinical and rehabilitative roles (Davidson et al. 1999, 2006; Felton et al. 1995; Gates and Akabas 2007; Griswold et al. 2010; Parker and Lemak 2011; Rosenick and Rosenheck 2008; Solomon 2004). Peer navigation interventions for physical health have promoted service access (Darnell 2007; Dohan and Schrag 2005; Griswold et al. 2010) and service utilization (Bradford et al. 2007). However, it is important to note that most navigation programs for physical health issues have been disease specific and the vast majority have focused on cancer (Parker and Lemak 2011).

The majority of studies support the use of peer providers as equally efficacious or sometimes more effective than non-peer providers (Felton et al. 1995; Griswold et al. 2010; Simpson and House 2002). At worst, there was no evidence of harm when peers were made a part of a client's mental or physical care in roles such as case managers, advocates, and community service providers (Gates and Akabas 2007). Moreover, peer providers report a variety of positive impacts on their own personal and professional well-being (Lawn et al. 2007). The purpose of this study was to examine the preliminary effectiveness and promise of a peer-delivered comprehensive health care engagement and self management intervention. The intervention was designed to reduce barriers to healthcare utilization and improve the health and well-being of individuals with SMI.

Methods

Overview of "The Bridge" Peer Health Navigator Intervention

Our intervention model is based on an adaptation of Gelberg et al. (2000) Model for Vulnerable Populations, which identifies the multiple factors that can suppress or facilitate health care service use to those with SMI (see Brekke et al. 2013). "The Bridge" intervention aims to target factors that negatively impact healthcare access, utilization, and outcomes among individuals with serious mental illness. Unlike specific disease treatment models, where clients are taught to deal with a single disorder such as diabetes or cancer, Bridge is a comprehensive healthcare engagement and self management model, where clients are taught the skills to access and manage their healthcare effectively. The intervention is comprehensive as it connects people to preventative, primary, and specialty health care services. It is an engagement model because we have found that many of the SMI have been unable to successfully engage a consistent primary healthcare provider, or have given up trying to access outpatient primary care. Self management means that we are training people to be assertive and empowered self-managers of health care services so that their interactions with care providers can be more effective. This is also an in vivo approach that develops self management skills in real world health care settings. The in vivo approach is important because these settings are ideal for teaching self management skills that are sustainable. A description of the development, conceptual background, components, and feasibility of the Bridge intervention is available in Brekke et al. (2013).

The Bridge intervention is manualized and consists of four components, namely: (i) Assessment and Planning; (ii) Coordinated Linkages; (iii) Consumer Education; and (iv) Cognitive-Behavioral Strategies to support health care utilization behavior change and behavior maintenance. The Assessment and Planning component consists of a comprehensive assessment of the consumer health status and healthcare service utilization history as well as the development of a detailed health navigation plan. The Coordinated Linkages component consists of several activities that aid consumers in navigating the healthcare system, including helping them make appointments, communicating with medical care providers, and ensuring follow-up care as well as adherence to medical treatment plans. The Consumer Education component includes the provision of education pertaining to: the health care system, partnering with medical providers, treatment compliance, self-advocacy, appropriate interaction skills, health and wellness issues, and health benefits and entitlements. The Cognitive-Behavioral component entails the use of modeling, coaching, prompting, reinforcement, role-playing, and fading to build healthcare efficacy and behavioral competence in healthcare access and use. Through these strategies we train those with SMI to become more strategic users and self managers of comprehensive healthcare services.

The Bridge is delivered in two phases. The first phase involves intensive, in-person contact between the navigator and the consumer. During this phase, a method for guiding the work, which is expressed explicitly as: “for them, with them, by them”, is used. Using behavioral strategies of modeling (“for them”), coaching (“with them”), and fading (“by them”), the goal is to promote consumer skill building so they can achieve maximal independence in managing their healthcare. During the second phase, once a client has begun to internalize the lessons from the consumer education and cognitive behavioral strategies and has become a more strategic user and manager of health care services, the navigator fades out his/her assistance, monitors from a distance, and the client assumes more responsibility for their healthcare. The timing of the transition from phase 1 to phase 2 is individualized, as consumers progress at different rates in learning the necessary skills for independent health navigation.

Participant Recruitment

Twenty-four participants were recruited for the study from two sites of a large contract provider of mental health services in Southern California. The program sites were selected on the basis of having demonstrated competency in the provision of mental health rehabilitation services and willingness to participate in the pilot intervention. The program sites delivered a comprehensive range of services targeting vocational, social and independent living rehabilitation for individuals with SMI. A convenience sampling strategy was employed to enroll clients in the study. Prior to the onset of recruitment, research staff met with clinic staff at the sites to outline the eligibility criteria for study participation. Clinic staff at the sites identified study candidates who were willing to participate in health navigation, and obtained permission to allow the research team to contact them. The research team subsequently approached all eligible and interested candidates to discuss study participation and only one individual refused to participate (96 % participation rate). Consent procedures were performed by a trained research assistant (PhD student) with clinical and research experience with the population of individuals with SMI. All participants provided informed consent in accordance with the research protocol, which was approved by the Institutional Review Board (IRB) at the University of Southern California (USC) and the participating mental health agency.

All participants were to be between the ages of 18–60, active recipients of mental health care, and residents in Los Angeles for at least 3 months. Participants could not be under conservatorship (required by the County DMH), unable to give informed consent, or be hospitalized at the start of the study. All participants were diagnosed with a serious mental illness and were in a publicly-funded setting that treated the most disabled and highest users of mental health services (Gilmer et al. 2010).

Study Design

Enrolled participants ($N = 23$) were randomly assigned to either the immediate intervention group (*treatment* condition) or to a wait-list group who received their usual treatment (*treatment as usual* condition [TAU]), with navigation beginning after 6 months on the wait-list. Participants were recruited in groups of six and then randomized (by the project manager) using a random numbers table. A trained peer navigator who was involved in the development and manualization of the intervention worked with all participants. Participation in the study did not affect the receipt of usual mental health services.

Assessments were conducted immediately post-randomization (Time 1) and 6 months after (Time 2) for both groups. The TAU group also had another follow-up at 12 months (Time 3). Therefore, participants in the treatment group were evaluated at 2 time points [baseline post-randomization, 6 months (post-intervention)] while participants in the wait-list group were evaluated at 3 time points [baseline post-randomization, 6 months (second baseline), 12 months (post-intervention)]. For the purposes of this paper, we have only included data from Time 1 and Time 2 as there is more complete data from both the treatment and control groups available at these time points. Further, as this was a pilot study, only a single peer navigator conducted the intervention and it was unclear how many clients a navigator could assist successfully at the same time. While the respondents in the initial treatment group had a high number of contacts ($M = 18.58$, $SD = 16.86$), those in TAU group who received the intervention after waiting 6 months, had significantly fewer contacts ($M = 8.73$, $SD = 5.88$; $t(21) = 1.84$, $p = .04$) according to independent t-tests. Therefore, due to weaker administration of the intervention to the wait-list group, the data from the third time point are not included in these analyses.

Measures

To examine the preliminary efficacy and promise of the health navigation intervention, measures of health status, healthcare utilization, and barriers to healthcare were included. Demographic information was obtained for ethnicity, gender, age, education level, income and marital status using a questionnaire at baseline.

Health Status and Complaints

Participants selected yes/no for whether they were currently experiencing any of 24 common health symptoms. A count of the number of health complaints was used in analyses. For descriptive purposes at baseline, participants were asked whether they had ever been diagnosed with 11 disorders common among this population, or any other medical diagnoses. Participants also rated whether they were experiencing pain (0 = ‘none’ to 6 = ‘very severe’), and how much their pain interfered with their functioning (1 = ‘not at all’ to 5 = ‘extremely’). These items were drawn from the SF-6D (Ara and Brazier 2008). As these items utilize slightly different rating points, a z-score transformation was completed on each of these variables and the z scores were summed to create a pain index.

Health Service Utilization

Receipt of health care services was measured in two ways using an adapted version of the UCLA CHIPTS health care and health utilization survey. This measure includes items on the locations of services utilized (i.e., emergency care, urgent care, doctor’s office). First, participants reported where they usually seek health care (emergency room, urgent care facility, or primary care provider). Secondly, participants estimated how often they had seen different providers, which was categorized into three groups 0 = ’not seen’, 1 = ’seen once’, 2 = ’seen multiple times’. Providers were classified as either Higher Cost/Urgent Care providers if they were located in an emergency room, general hospital, nursing home, or assisted living facility. Providers were classified as Lower Cost/Routine Care providers if they were a primary care, specialty care, or other doctor.

Medications

Clients were asked to report all their prescribed medications, and, if they could not remember, they were asked to bring a printed copy of the medications or gave permission for the navigator to review their chart for their list of prescribed medication. Three count variables of all currently listed medications for physical and mental health were created (total, mental health, and physical health).

Health Care Self-Efficacy

For this study the Health Care Efficacy Scale was adapted from the Mental Health Confidence Scale (Carpinello et al. 2000) for challenges specific to the healthcare setting. Participants rated on a 6-point scale how confident they are about coping with various issues (0 = ’not confident at all’ to 6 = ’very confident’). Using the stem of “How confident are you right now that you can: …”, participants rate their confidence about managing challenges within the healthcare context (“Handle a medical doctor’s visit from start to finish”).

Data Analysis

A primary objective of this study was to evaluate the potential efficacy, or promise, of the health navigation intervention. As this is a small scale feasibility study, greater attention was paid to effect sizes rather than statistical significance levels (Borenstein 1997). Since our major concern was with Type 2 errors as opposed to Type 1 errors, one-tailed tests of statistical significance were used and results at $p < .10$ were considered encouraging. As noted above, the current analyses report on the comparison between the immediate *treatment* group and the *treatment as usual* group (TAU) from Time 1 to Time 2, using the second baseline as the Time 2 TAU observation. A series of within-group, between-group, and change score analyses were performed. Paired t-tests and one-tailed Fisher tests were used to examine within-group analyses on continuous and categorical variables, respectively. Independent Samples t-tests and one-tailed Fisher Tests were used to examine between-group analyses on continuous and categorical variables, respectively. Change score analyses were used to analyze the main pre- and post-intervention effects between groups.

Results

Participants

A total of 24 participants were randomized to either the treatment condition or the TAU condition. All 12 participants in the treatment group completed assessments at both time points (Time 1 and Time 2) while 9 participants in the TAU group completed assessments at all required time points (Time 1: $N = 11$, Time 2: $N = 9$, Time 3: $N = 9$). In total 23 of the 24 participants completed baseline assessments, with 1 participant from the TAU group dropping out after consenting to participate, but prior to the baseline evaluation. The reasons for dropping out of the study were undetermined.

Sample Baseline Characteristics

As noted above, 23 participants completed the baseline questionnaires. Participants' demographics are presented in Table 1. Over half of the participants were male, with an annual income less than $10,000, with equal to or less than a high school education. Nearly all of participants in the sample were collecting some form of disability income and few were married or living with partner. Only one participant, who was in the immediate treatment group, was not enrolled in a healthcare plan such as MediCal, Medicare, or other program at baseline. Over the course of navigation, this client was enrolled in a county-funded healthcare plan. The sample was ethnically diverse with the majority of the sample being ethnic minority, which is similar to other samples accrued from this agency (Brekke et al. 1997, 2010).

The prevalence of self-reported medical conditions at baseline was diabetes (48 %), heart disease (22 %), high blood pressure (39 %), high cholesterol (39 %) and respiratory ailments (30 %). An assessment of 24 current medical complaints shows that almost the entire sample endorsing having 2 or more medical problems, over 75 % of the sample reporting having 5 or more problems, and nearly half reporting having 10 or more problems. Most participants reported that they usually seek healthcare services from the emergency room (39 %) or urgent care (13 %), with just under half of participants using a primary care doctor for any health issues (48 %). The endorsement of each symptom is presented in Table 2 for the treatment and TAU groups. In comparisons of health issues, health service use, and health care efficacy (presented in Table 3), the only difference noted at baseline was in the number of medications. Specifically, those in the treatment group listed significantly more mental health medications than the TAU group. Very importantly, there was no significant difference between the treatment ($M = 2.18$, $SD = .72$) and TAU groups ($M = 2.60$, $SD = 1.02$; $t(21) = -1.15$, $p = .26$) on the Basis-32, used as a measure of psychiatric symptoms and functional status (Eisen et al. 1999).

Month Follow-Up

Independent *t* test comparisons of baseline, follow-up, and change scores between the treatment and TAU groups in terms of their health status, service use, and health efficacy are presented in Table 3. At the 6-month follow-up, the treatment group outperformed the control group on several measures of health status and healthcare utilization, indicating better health status and more appropriate healthcare utilization..

Health Status

Both the treatment and the TAU group reported high levels of symptoms at baseline (7.50 vs. 9.63; see Table 3). However, after 6 months, the number of symptoms in the treated group was significantly lower than the TAU group ($p < .10$). Using change scores, the symptoms among the treatment group declined while the number of symptoms in the TAU group increased slightly, with a moderate effect size of .45. Another way of estimating the impact of the intervention is to examine the within-group changes. While not significant in this small sample ($t(11) = 1.00$, $p = .18$), according to paired t-tests, the effect size of symptom decrease among the treatment group was .60 versus the .31 effect size of the symptom increase among the TAU group ($t(8) = -.44$, $p = .34$).

However, examining the average number of symptoms a person may have can mask fluctuations in particular symptoms. Therefore, we examined the change in symptoms from baseline to the follow-up. Symptoms that were present at baseline but absent at the 6 month follow-up were considered *improved* and symptoms that were absent at baseline but present at follow-up were considered *declined*. On average, participants who received the health navigation intervention reported 2.08 ($SD = 2.81$) symptoms of declining health and 3.67 ($SD = 3.55$) of improved symptoms. Conversely, those in the TAU group reported 3.11 ($SD = 2.62$) symptoms of declining health and 2.56 ($SD = 2.65$) symptoms of improvements in health. While these changes in symptoms were not significant, the effect sizes of the differences between the improved/worsening symptoms of each of the groups are in the moderate range (Improving: .36; Worsening: .39). When the number of symptoms recovered is subtracted from the number of symptoms developed, the difference in changes between the groups also show that there is moderate effect size of .46 in favor of the intervention.

Table 1 Overview of sample demographic characteristics

	Total sample		Treatment		Usual care	
	n (%)	*M (SD)*	*n (%)*	*M (SD)*	*n (%)*	*M (SD)*
Age		46.78 (8.45)		49.58 (9.51)		43.73 (6.15)
Gender						
Male	13 (56.5)		7 (58.3)		6 (54.5)	
Income						
SSI/SSDI	22 (95.7)		11 (91.7)		11 (100)	
Income amount						
Less than $10,000	12 (52.2)		8 (66.7)		4 (36.4)	
$10,000 to $20,000	9 (39.1)		3 (25.0)		6 (54.5)	
Greater than $20,000	2 (8.6)		1 (8.3)		1 (9.1)	
Level of education						
High School or less	14 (60.9)		8 (66.7)		6 (54.5)	
Greater than High School	9 (39.1)		4 (33.3)		5 (45.5)	
Marital status						
Married/cohabitating	3 (13.0)		2 (16.7)		1 (9.1)	
Widowed/divorced/separated	11 (47.8)		5 (41.7)		6 (54.6)	
Never married	9 (39.1)		5 (41.7)		4 (36.4)	
Race						
White	6 (26.1)		4 (33.3)		2 (18.2)	
African American	8 (34.8)		2 (16.7)		6 (54.5)	
Latino	3 (13.0)		1 (8.3)		2 (18.2)	
Mixed race/other	6 (26.1)		5 (41.7)		1 (9.1)	

Table 2 Descriptives of the baseline current health complaints for the total sample, treatment, and treatment as usual groups

Variables	Total sample ($n = 23$)	Treatment group ($n = 12$)	Treatment as usual group ($n = 11$)		Total sample ($n = 23$)	Treatment group ($n = 12$)	Treatment as usual group ($n = 11$)
Current medical complaints (%)							
Fever	5 (21.7 %)	2 (16.7 %)	3 (27.0 %)	Coordination loss	6 (26.1 %)	4 (33.3 %)	2 (18.2 %)
Cough	13 (56.5 %)	7 (58.3 %)	6 (54.5 %)	Chest pain	10 (43.5 %)	6 (50.0 %)	4 (36.4 %)
Rash	2 (8.7 %)	1 (8.3 %)	1 (9.1 %)	Heartburn	10 (43.5 %)	6 (50.0 %)	4 (36.4 %)
Allergies/Hay fever	7 (30.4 %)	3 (25.0 %)	4 (36.4 %)	Headaches	13 (56.5 %)	6 (50.0 %)	7 (63.6 %)
Nausea	10 (43.5 %)	3 (25.0 %)	7 (63.6 %)	Memory loss	10 (43.5 %)	5 (41.7 %)	5 (45.5 %)
Weight loss/gain	6 (26.1 %)	2 (16.7 %)	4 (36.4 %)	Bruising	9 (39.1 %)	5 (41.7 %)	4 (36.4 %)
Abdominal pain	10 (43.5 %)	4 (33.3 %)	6 (54.5 %)	Ringing ears	7 (30.4 %)	3 (25.0 %)	4 (36.4 %)
Breathing difficulty	8 (34.8 %)	4 (33.3 %)	4 (36.4 %)	Hearing loss	5 (21.7 %)	2 (16.7 %)	3 (27.3 %)
Fatigue/weakness	10 (43.5 %)	4 (33.3 %)	6 (54.5 %)	Vision changes	7 (30.4 %)	4 (33.3 %)	3 (27.3 %)
Cold/heat intolerance	5 (21.7 %)	3 (25.0 %)	2 (18.2 %)	Teeth/Gums	12 (52.2 %)	7 (58.3 %)	5 (45.5 %)
Fainting	2 (8.7 %)	0 (0.0 %)	2 (18.2 %)	Sexual function	9 (39.1 %)	2 (16.7 %)	7 (63.6 %)
Dizziness	8 (34.8 %)	4 (33.3 %)	4 (36.4 %)	Joint/Muscle pain	12 (52.2 %)	3 (25.0 %)	9 (81.8 %)

Pain is another indicator of health status. At baseline, those in the treatment and TAU groups reported moderate to high amounts of pain and interference in their daily living from pain (see Table 3). Using paired *t* tests, individuals receiving the health navigation intervention reported significantly less bodily pain ($t(11) = 2.28$, $p < .05$), and less interference from pain while doing normal work ($t(11) = 3.46, p < .01$). Conversely, the TAU group did not experience any significant change in terms of their bodily pain ($t(8) = -.24$, $p = .81$) or how much

Table 3 Independent *t* test and Ch-square comparisons of the treatment and treatment as usual groups for health issues, service use, and health care efficacy

Variables	Treatment group ($n = 12$)	Treatment as usual group[a] ($n = 11$)	*t* value	Cohen's d effect size
Health issues				
Bodily pain				
Baseline	3.83 (1.80)	4.27 (1.42)	−0.65	
Follow-up	3.08 (1.56)	4.22 (1.72)	1.59*	
Change score	−0.75 (1.14)	0.11 (1.36)	−1.58*	.72
Bodily pain interference				
Baseline	3.00 (1.41)	3.22 (1.56)	−0.60	
Follow-up	2.17 (0.94)	3.11 (1.36)	1.79**	
Change score	−0.83 (0.83)	−0.11 (1.17)	−1.66*	.76
Total number of health problems				
Baseline	7.50 (3.97)	9.63 (6.20)	−0.99	
Follow-up	5.92 (4.74)	9.33 (4.36)	1.69*	
Change score	−1.58 (5.48)	0.56 (3.78)	−1.00	.45
Services from providers				
Number of ER/urgent care visits				
Baseline	1.67 (2.02)	2.64 (1.80)	−1.21	
Follow-up	1.42 (1.78)	2.00 (1.50)	0.79	
Change score	−.25 (1.96)	−0.78 (0.97)	0.74	.34
Number of routine care visits				
Baseline	2.00 (1.91)	2.82 (2.27)	−0.94	
Follow-up	2.50 (1.45)	2.11 (1.45)	−0.61	
Change score	.50 (2.61)	−.56 (1.33)	1.11	.51
Number of total medications				
Baseline	4.58 (2.97)	3.50 (1.98)	0.83	
Follow-up	4.83 (2.89)	8.10 (6.61)	1.45*	
Change score	.25 (3.19)	3.56 (3.64)	−2.21**	.92
Number of mental health medications				
Baseline	3.08 (1.98)	1.50 (1.18)	2.22**	
Follow-up	2.83 (1.80)	3.50 (2.68)	0.70	
Change score	−.25 (2.09)	1.56 (2.19)	−1.92**	.88
Number of physical health medications				
Baseline	1.50 (1.38)	1.70 (3.09)	−0.20	
Follow-up	2.00 (1.71)	4.70 (4.99)	1.76**	
Change score	.50 (1.73)	2.00 (2.78)	−1.52*	.70
Health efficacy				
Healthcare lack of efficacy score				
Baseline	52.08 (16.51)	55.00 (15.20)	−0.40	
Follow-up	52.00 (18.52)	54.44 (14.73)	0.33	
Change score	−0.08 (10.30)	−.55 (13.46)	0.09	.04
Preferred loci of care[b]				
Emergency room				χ^2-value
Baseline	4 (33.3 %)	5 (45.5 %)	1.04	
Follow-up	0 (0.0 %)	5 (55.6 %)	8.75***	.51
Urgent care				
Baseline	2 (16.7 %)	1 (9.1 %)	0.29	
Follow-up	0 (0.0 %)	0 (0.0 %)	–	

Table 3 continued

Variables	Treatment group ($n = 12$)	Treatment as usual group[a] ($n = 11$)	*t* value	Cohen's d effect size
Primary care				
Baseline	6 (50.0 %)	5 (45.5 %)	0.06	
Follow-up	10 (83.3 %)	4 (44.4 %)	3.50**	.30

* $p < .10$; ** $p < .05$; *** $p < .001$

All tests are one-tailed due to the small sample size and consequent greater concern about Type I error over Type II error

[a] The presented baseline means are for full the treatment as usual group, the change scores reflect differences between only those who have assessments at both baseline and follow-up (n = 9)

[b] Descriptives of the preferred loci of care variables are the n and the percentage of each group obtaining services in each locus of care. The statistics presented are the p values of one-tailed Fisher's exact tests

bodily pain interfered with their functioning over time ($t(8) = .29, p = .78$). When combined into an index of pain (using z-score transformation due to differences in the rating metrics), the treatment group experienced a significant reduction in pain issues ($M = -.59$, $SD = 1.44$) compared to the TAU group ($M = .78$, $SD = 1.73$) over time ($t(19) = -1.99, p = .03$) which has a large effect size of .91.

Medication

Clients self-reported a list of prescribed medications that they used, and/or their charts were reviewed for the list of their medications. As noted above, while there were no significant differences in the total number of medications or number of physical health medications listed across groups, the treatment group had significantly more mental health medications than the TAU group at baseline (see Table 3). However, after 6 months, the treatment group had a relatively constant set of medications, while the TAU group had more medications listed for mental and physical health. Moreover, the changes scores of these two groups suggest large effect sizes (.70–.92) in terms of the number of medicines listed.

Locus of Care

The location for obtaining health care services was captured in two ways: (i) the participants' selection of where they usually went to access care (e.g., outpatient office, urgent care, emergency room); (ii) participants reports of how often they went to different locations for health services (e.g., outpatient office, urgent care, emergency room). At baseline, there were no differences across groups in where clients usually sought care or in how often they obtained care from different sources. After 6 months, there were significant changes in what clients identified as their usual locus of care. Specifically, after 6 months none of the treatment group reported that the emergency room was the usual place they sought care (55.6 % did at baseline) or urgent care centers (16.7 % did at baseline), while 83.3 % looked to use a primary care doctor's office for healthcare treatment (44.4 % did at baseline). In other words, from pre- to post-treatment, 33 % of the treatment group stopped thinking of the emergency room as their usual place of care while 0 % started thinking of using the emergency room ($p < 05$). Conversely, after 6 months there were no changes in the preferred locus of care for the TAU group care.

In terms of where they reported obtaining care, there were no significant changes in either groups average behavior, however, the direction of the changes in the treatment group were encouraging. When the changes in the use of outpatient routine care providers for both groups were compared, the .51 effect size for the treatment group to utilize routine providers more than the TAU group suggest that the intervention had benefits for participants. The relationship between the severity of symptoms and the rate of emergency room use could be an indicator of the appropriate use of intensive services. We tested the correlations between symptoms at baseline with the loci of care at baseline and follow-up. The baseline correlation would indicate how health symptoms at baseline were related to ER use in the previous 6 months, while the correlation of BL symptoms and ER use at follow-up would represent the association between symptoms at BL and the use of ER during the 6 month study period. At baseline, the number of symptoms for the treatment group and the TAU group were uncorrelated with their visits to the emergency room ($r = .00$, $p = 1.00$ and $r = .24$, $p = .48$ respectively (two-tailed)). Conversely, during the intervention period, there was a strong positive correlation in the treatment group between the number of symptoms reported at baseline with their visits to the emergency room ($r = .75$, $p < .01$), whereas among those in the TAU group, their symptom severity was still not significantly correlated with their visits to the emergency room ($r = .36$, $p = .34$). These associations were also apparent when overall urgent care usage variables were tested with total health symptoms.

Health Care Efficacy

On average, clients in both groups reported being confident about their abilities to make appointments, to get to appointments on their own or with someone's assistance, and to get prescriptions filled at baseline. No differences between or within groups were found on scores of healthcare efficacy (see Table 3).

Implementation and Fidelity of the Intervention

The health navigator kept a log of all contacts he had with each client. The extent of implementation across participants varied from contacts occurring once a month to 12 times a month, with an average of three contacts a month. Log notes revealed that the length of the contacts ranged from 10 min to over 4 h with the navigator assisting on an average of 6 medical visits with the lab, pharmacy or physician for each participant. We used the Working Alliance Inventory (WAI; Andrusyna et al. 2001) as an indicator of the quality of the relationship with the navigator. The average item score (across 12 items) was 5.2, with 1 representing "never" and 7 representing "always" in terms of the positive character of the relationship. Concerning fidelity, the peer navigator was part of the team that developed and manualized the intervention before this study began. While we have subsequently developed a fidelity protocol, during this study period we used weekly team meetings, frequent phone contact, and weekly discussions of each case to maintain fidelity to the guidelines of the intervention.

Discussion

The focus of this pilot study was to examine the preliminary efficacy of the Bridge intervention, a peer health navigation intervention for individuals with serious mental illness. We had previously determined that the intervention could be successfully implemented by a peer provider, and was acceptable to peers, clients, and other agency staff (Brekke et al. 2013). The outcomes reported here suggest that the Bridge peer health navigation intervention demonstrated considerable promise through positively impacting a range of outcomes related to health status and healthcare utilization. Specifically, participation in the intervention was associated with improved health status and declines in pain severity. The decline in the number of reported health problems is notable given the severity of the problems reported. The findings suggest that without the intervention, those with serious mental illness may be not only diagnosed with severe medical ailments but also may be experiencing a host of symptoms that may be manifestations of diagnosed or undetected diseases. Furthermore, it appears all-too-common for those with serious mental illness to be suffering from clusters of symptoms rather than a solitary symptom. Given that worsening medical problems have been known to exacerbate psychiatric conditions (Dixon et al. 1999), ensuring appropriate medical care for those with serious mental illness also supports efforts for psychiatric stabilization and maintenance.

The impact of the intervention on pain is important for two reasons. First, pain is an indicator of health problems and subjective distress, and second, there appears to be a bidirectional relationship between pain and mental health outcomes. For instance, prior work suggests that there is a bidirectional relationship between moderate to severe pain with depression symptoms. Not only is pain related to worsening depression outcomes but also the experience of depression among those with pain is linked to higher pain complaints and impairment (Bair et al. 2003).

Medication non-compliance is a serious issue for those with SMI and chronic health issues. Among those with SMI, around 40–50 % of outpatients do not take their antipsychotic medications as prescribed (Cramer and Rosenheck 1998; Kelly and Scott 1990; Lacro et al. 2002). Further, failure to adhere to treatment is largely responsible for mortality and serious complications for diabetes, hypertension, and asthma (WHO 2003). In the present study, prescriptions for mental and physical medications increased significantly over the course of the study for the TAU group while remaining relatively steady among those in the treatment group. The more consistent rate of prescriptions, along with the improvements in health, suggests that those in the treatment group might be receiving a more effective medication regimen. Conversely, the increase in prescriptions, in the absence of positive health changes, suggest that clients in the TAU group may not actually be getting those medications from the pharmacy or are not taking their medication as prescribed, as up to 30 % of prescriptions are never picked up at the pharmacy (Fischer et al. 2010). The greater rate of prescription medication among the TAU group could also be a reflection of doctors' frustration, as they prescribed more and more medication to treat the same symptoms, without effect. This highlights that interventions that solely connect consumers with doctors are insufficient as most of those in the TAU group reported going to a healthcare provider (though those services were often at the ER) but these visits were not associated with improved health. Clearly, it is insufficient to get clients to doctors and prescribed medications, as there are several points after an appointment where treatment may not be followed (not following care plans, not getting medication from pharmacy, not taking medication, not taking medication as prescribed, or with other medications that can negatively interact).

The reported rates of emergency room use in the overall sample (60 % at baseline, 63 % at follow-up) are higher than the 37 % found previously among those with SMI (Hackman et al. 2006), which demonstrate the high need for intervention in our sample. High rates of emergency room use may be considered an indicator for more expansive, systemic issues, such as limited access to non-emergency health (Tyrance et al. 1996). Others have also indicated that excessive utilization of the emergency room for non-urgent care needs may be associated with higher costs and worse medical outcomes (Krugg 1999). Participants in the treatment group became more strategic users of the emergency room. They continued using the emergency room but their use of it became related to the severity of their health issues, whereas those in the TAU group used the emergency room regardless of their symptoms. Analyses did reveal large changes in where individuals stated they usually sought healthcare following the intervention. Individuals receiving health navigation learned to consider alternatives to the emergency room and thought to seek services at a primary care doctor more. Therefore, the current findings support the notion that peer health navigation interventions could have economic as well as medical implications.

This study also found areas that could be improved for a full intervention trial. At baseline, clients reported that, on average, they felt confident about their own abilities to obtain healthcare and after 6 months of the intervention they continued to feel confident. The lack of significant improvement in clients' sense of confidence about obtaining health care services suggests several possible interpretations. While it is possible our intervention truly did not alter participants sense of healthcare efficacy, our measure did not assess client reports of their actual self management behaviors. In future studies, participants will be asked about the frequency that they have engaged in healthcare self-management behaviors, and more emphasis will be placed on documenting healthcare efficacy in the training of navigators. Similarly, the health navigator reported that all clients in the intervention showed significant progress towards self-management; however, in future studies the participants' uptake of self management skills needs to be more carefully assessed using in vivo observations or analogue role plays. Finally, the utilization of health care services needs to be tracked with existing administrative data that are linked to billing.

Although the current study was small in scale, the baseline state of health among those in the sample, as indicated by the history of diagnosed illnesses, was similar to recent intervention work with individuals with serious mental illness (Druss et al. 2010b). While the limited sample size precludes any serious discussion of generalizability, these results offer a modicum of evidence that the promise of the intervention was examined in a sample that shared a health profile consistent with the literature.

Given that over 70 % of our current sample were ethnic minorities, the results of this study could have important implications for racial and ethnic minorities as these groups typically receive lower quality health care than whites even after accounting for other factors such as insurance status, income, age, and condition severity (Institute of Medicine 2003). Research has established that one half to three quarters of the disparities would remain even if racial/ethnic disparities in income and health insurance coverage were eliminated (Weinick et al. 2000). In future studies, larger diverse samples should be utilized to assess whether our intervention reduces disparities in health outcomes in a broad range of the population of the SMI and their associated health issues.

The current study carries limitations common in pilot work. First, as acknowledged earlier, the sample size was quite small, which has implications for statistical power as well as capturing the heterogeneity of the target population. Further, due to the small sample, this pilot study utilized a single navigator who also contributed to the development of the intervention. Though a modest sample is appropriate for the current pilot study, a larger randomized trial is needed to test the effectiveness of the intervention and to disentangle whether the effects reported are due to the Bridge program or due to the characteristics of any single navigator. We are currently developing a training manual to ensure that future navigators develop competencies that we believe are central to the effectiveness of the Bridge. This manual will specify the length, nature, and duration of training needed for peers to develop health navigator skills. Second, this study included a convenience sample in that random selection was not used. Third, the study predominantly relied on self-report measures; future studies should aim to include objective sources of data, such as medical records and administrative data on utilization to ensure the validity of self-reports. Fourth, the greater attrition in the TAU-waitlist condition needs to be better understood.

Given the stated limitations, this pilot study provides a critical first step in examining the potential efficacy of a peer health navigation intervention in improving general healthcare access and outcomes among those with serious mental illness. Despite a limited sample size and short duration of follow-up, the intervention showed promise in reducing medical symptoms as well as directing those seeking treatment into healthcare destinations that are not only less costly but, more importantly, stand to yield greater preventive and long-term health benefits. In the spirit of moving from "silos to bridges" (Horvitz-Lennon et al. 2006), "The Bridge" peer health navigation intervention appears to provide a potentially effective crossing to facilitate more integrated and self-managed health care for the seriously mentally ill.

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