Published in final edited form as:

J Assoc Nurses AIDS Care. 2013 ; 24(2): 135–144. doi:10.1016/j.jana.2012.05.001.

Social Support Networks and Primary Care Use by HIV-Infected Drug Users

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Abstract

HIV-infected current and former drug users utilize primary care and preventive health services at suboptimal rates, but little is known about how social support networks are associated with health services use. We investigated the relationship between social support networks and the use of specific types of health services by HIV-infected drug users receiving methadone maintenance. We found that persons with greater social support, in particular more social network members or more network members aware of their HIV status, were more likely to use primary care services. In contrast, social support networks were not related to emergency room or inpatient hospital use. Interventions that build social support might improve coordinated and continuous health services utilization by HIV-infected persons in outpatient drug treatment.

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Conflict of Interest Disclosure Statement

The authors report no real or perceived vested interests that relate to this article (including relationships with pharmaceutical companies, biomedical device manufacturers, grantors, or other entities whose products or services are related to topics covered in this manuscript) that could be construed as a conflict of interest.

Keywords

drug users; health service utilization; HIV infection; social networks; social support

HIV-infected drug users have low rates of coordinated and continuous health care use (Arno et al., 1996; Cunningham et al., 2006; Knowlton, Hoover, Chung, Celentano, Vlahov, & Latkin, 2001; Shapiro et al., 1999) but disproportionately high hospitalization rates (Fleishman et al., 2005; Yehia, Fleishman, Hicks, Ridore, Moore, & Gebo, 2010). Although clinical care models integrating primary care and substance abuse treatment have been associated with improved health care utilization and better HIV outcomes (Cunningham, Sanchez, Li, Heller, & Sohler, 2008; Cunningham et al., 2007; Knowlton et al., 2001; O'Toole, Pollini, Ford, & Bigelow, 2007; Selwyn, Budner, Wasserman, & Arno, 1993), little is known about other factors that influence primary care use. In particular, it is unknown how social support affects the use of primary care by HIV-infected drug users.

Previous research has shown that greater social support is associated with primary care use, while poor social support is associated with the use of emergent and inpatient care. For example, Samet and colleagues (1998) demonstrated that delays in access to health care services after HIV testing were related to the absence of specific social network members (e.g., spouses/partners). Similarly, Devillanova (2008) found that having a strong social network was associated with a 30% reduction in wait time for medical care among immigrants. Conversely, Kouzis and Eaton (1998) found that the combination of psychological distress and poor social support was associated with more medical provider visits, and others have found that lack of a supportive social environment was related to increased hospital use (Bosworth & Schaie, 1997).

To examine the association between social support and use of primary health care among HIV-infected drug users, we used Anderson's behavioral model of health care utilization (Anderson, 1968), including subsequent revisions of the model (Anderson, 1995). In its earliest phase, the model focused on individual-level determinants of health service utilization: an individual's predisposing characteristics (demographic factors), enabling resources (income, health insurance, source of care), and perceived need for health services (perception of general health and functional state; Anderson, 1968). However, the initial model was criticized for lack of explicit focus on social networks (Bass & Noelker, 1987; Pescosolido, 1992; Portes, Kyle, & Eaton, 1992). Acknowledging these variables at a later date, Anderson (1995) inserted them as structural-level variables (e.g., community-level networks, culture) or enabling resources (e.g., social support networks, quality of social relationships). In this study, we tested how one enabling resource – social support networks – affected health care use among HIV-infected drug users.

We hypothesized that features of a person's social relationships – greater social support – were related to increased use of primary health care (Nyamathi, Leake, Keenan, & Gelberg, 2000), while poor perception of social support was related to inpatient and emergency service use (Bosworth & Schaie, 1997). In this study we specifically defined social support networks as the density, quality, and characteristics of a person's social support network. Greater perception of social support from networks would include the following: greater density of network members; greater emotional, affirmative, or concrete support; and supportive types of network members (e.g., a family member, partner, or someone aware of their HIV status). Poor perception of social support would include fewer social support network members, lower quality of social support, and potentially unsupportive network members (e.g., drug-using network members).

Methods

We analyzed data from the Support for Treatment Adherence Research through Directly Observed Therapy (STAR*DOT) study (Berg et al., 2009), a randomized trial designed to test the efficacy of an antiretroviral directly observed therapy (DOT) program in methadone maintenance clinics. The parent STAR*DOT study was a 24-week trial conducted in a network of 12 methadone maintenance clinics in the Bronx, New York. The clinics, administered by the Albert Einstein College of Medicine and Montefiore Medical Center, provided care to approximately 4,000 clients, of whom 10%–15% were HIV infected. On-site integrated HIV care was available to all participants, although not a requirement for entry into the parent study.

STAR*DOT participants were recruited and interviewed at their methadone clinics. Participants were randomly assigned to self-administer their antiretroviral medications (treatment as usual) or to receive antiretroviral DOT delivered in the methadone clinic. The primary outcomes of the parent study were: (a) changes from baseline to study end in HIV viral load, (b) antiretroviral adherence, and (c) number of drug resistant mutations of HIV. Participants were eligible for the STAR*DOT study if they were HIV infected, prescribed antiretroviral therapy, received HIV medical care at a clinic affiliated with their methadone clinic, attended the methadone clinic 5 or 6 days per week, were on a stable dose of methadone for at least 2 weeks prior to study start, and were genotypically sensitive to their antiretroviral regimens (Berg et al., 2009).

Recruitment began in June 2004 and ended in August 2007. The study team screened 3,231 potential participants and, of these, 97 were eligible and 77 enrolled. Follow-up of the last participant ended in February 2009. The STAR*DOT study was approved by the Institutional Review Boards of Albert Einstein College of Medicine and Montefiore Medical Center. All participants gave written informed consent. The STAR*DOT study has been described in more detail elsewhere (Berg, Litwin, Li, Heo, & Arnsten, 2011; Berg et al., 2009).

Interview

The analysis reported in this article includes data from the STAR*DOT baseline assessment, which consisted of a survey administered using Audio Computer-Assisted Self-Interview (ACASI) technology. ACASI allowed the participants to simultaneously read each question on the computer screen and listen to it read aloud through headphones. The STAR*DOT baseline interview took 2 to 4 hours to complete.

Dependent Variable

Our primary outcome was health care utilization (Weaver et al., 2008), defined as primary care, emergency room, and/or hospital use in the previous 3 months. We defined primary care use as at least one visit at a hospital-based clinic, a community clinic, a neighborhood health center, or a private physician's office. To assess emergency room and hospital use, we asked participants the following questions: *During the past 3 months, did you go to a hospital emergency room for emergency care?* and *Were you a patient in any hospital overnight or longer?* We considered participants to have used the service if they had one or more visits in the previous 3 months.

Independent Variables

Our primary independent variable was current social support, assessed using the Norbeck Social Support Questionnaire (NSSQ) (Norbeck, 1995; Norbeck, Lindsey, & Carrieri, 1981). To complete this scale, participants listed the names of significant people who provided

them with support, including their relationship to that person. Significant people were defined as *people you could go to for personal advice and support, who could lend you money to get you out of a jam, or to whom you could turn to for help*. Participants then used a 5-point scale (ranging from *not at all* to *a great deal*) to rate the amount of support available from each person, with higher scores indicating greater support.

The NSSQ measures three domains of social support. Affective or emotional support is assessed with two items about each listed person (*How much does this person make you feel liked or loved?* and *How much does this person make you feel respected or admired?*). Affirmative support is also assessed with two items (*How much can you confide in this person?* and *How much does this person agree with or support your actions or thoughts?*). Finally, concrete support is assessed with two items (*If you needed to borrow \$10, a ride to the doctor, or some other immediate help, how much could this person usually help?* and *If you were confined to bed for several weeks, how much could this person help you?*). The items in each domain had a high degree of correlation (Pearson coefficients of 0.97, 0.96, and 0.89) and good test-retest reliability (0.89, 0.88, and 0.86) in the original evaluation of the instrument (Norbeck, 1995).

To assess social support quantitatively (Norbeck, 1995), we first computed the number of significant persons in the network. Second, we generated a total support score by summing the responses to the six affective, affirmative, and concrete support items described above. Finally, we created a total network score by summing the number of significant persons in the network, the length of time the participant knew the network members, and how frequently the participant usually had contact with network members. All scoring was based on NSSQ scoring guidelines (Norbeck, 1995). We also examined whether each network member was a partner, family member, friend, drug user, HIV infected, or aware of the participant's HIV status, and summed the number of network members in each category (Nyamathi et al., 2000; Waddell & Messeri, 2006).

Potential covariates were based on the previously demonstrated relationship with health care utilization among HIV-infected persons (Arno et al., 1996; Cunningham et al., 2006; Cunningham et al., 2007; Knowlton et al., 2001; Shapiro et al., 1999). These included demographic factors (age, gender, race/ethnicity, education, employment, health insurance), psychosocial factors (homelessness, incarceration history, psychological distress, case management use), clinical factors (health status, duration of HIV infection, number of years on methadone), and recent drug or alcohol use (Arnsten et al., 2002; Derogatis & Spencer, 1982; Maisto & Saitz, 2003; McLellan, Luborsky, Woody, & O'Brien, 1980; Purcell et al., 2004; Wu, Revicki, & Malitz, 1997). Psychological distress was assessed using the Brief Symptom Inventory, a 53-item instrument with higher scores representing greater symptom manifestation (Derogatis & Spencer, 1982). We used the Brief Symptom Inventory Global Severity Score, which combines items to form a mean score. Health status was assessed using a single item from the Medical Outcomes Study-HIV (Wu et al., 1997).

Analyses

We first conducted bivariate analyses to examine associations between the social support network characteristics (number of significant persons, total support score, and total network score) and the health service utilization variables (primary care, emergency room use, and hospitalization). We then performed nine multivariate logistic regression analyses to test the relationship between each of the social support network variables and each type of health service utilization. Standard covariates in each model were: age, gender, and race/ethnicity. Other covariates with p values $<.20$ in bivariate analyses were also included. Finally, we examined associations between type of network member (partner, family member, friend,

drug user, HIV infected, or aware of participant's HIV status) and health service utilization. Data were analyzed using SAS software version 9.2 (Cary, NC, USA).

Results

Baseline Characteristics

There were 77 STAR*DOT participants in our study (Table 1). Mean age was 47 years (standard deviation = 6.89), 53% were men, and most were Black (40%) or Latino (46%). Half had not completed high school and very few were employed. Medicaid was the primary insurer (90%). Participants had been living with HIV for a median of 13 years and receiving methadone treatment for a median of 10 years. Despite methadone maintenance, ongoing substance use (heroin and cocaine) was common, and 19% indicated recent hazardous alcohol use. Health service utilization in the previous 3 months varied: 42% had used primary care, 23% had at least one emergency room visit, and 18% had at least one hospitalization.

Social Support Network Characteristics

Fifty-one of 76 participants with complete data reported having any network members (Table 1). Among those with any network members, the median was 2 (interquartile range [IQR] 1–3); the median total support score was 31 (IQR 21–56); and the median total network score was 15 (IQR 8–27).

Social Support Network Characteristics and Health Service Utilization

The number of significant persons associated with primary care utilization are described in Table 2. Each additional network member was associated with a more than two-fold increase in primary care service utilization (odds ratio [OR] 2.59, confidence interval [CI] 1.36–4.95). We also found that having a network member who was aware of the participant's HIV status was associated with a nearly three-fold increase in primary care use (OR 2.71, CI 1.44–5.10; data not shown in Table). In contrast, total support score and total network score were not associated with primary care utilization, and there were no significant associations between social support and either emergency room use or hospitalization. Other factors associated with primary care utilization included more years of education and history of incarceration, and other factors associated with emergency room use included female gender and worse health status.

Discussion

Among HIV-infected methadone-maintained drug users, we found that larger and HIV-specific social support networks are associated with use of primary health care services. As others have demonstrated (Kouzis & Eaton, 1998; Pescosolido, 1992; Portes, et al., 1992), we found that social relationships – the density and characteristics of a person's social network – facilitated access to certain health care services. As we hypothesized, however, our results demonstrated the “enabling” (Anderson, 1968) capacity of social relationships with regard only to primary care. Specifically, both male and female HIV-infected methadone patients who used primary care services in the previous 3 months had more social network members and also had network members who were aware of their HIV status. Social support networks were not related to the use of emergency room or inpatient hospital services. Because prior research has found that HIV-infected persons who enter the health care system through in-patient hospital services (rather than through earlier outpatient services) may be at increased risk for death (Welch & Morse, 2001), we believe that interventions should be developed to increase use of primary health care services by HIV-infected drug users.

Although our results were consistent with prior research (Bosworth & Schaie, 1997; Devillanova, 2008; Kang et al., 2007; Kouzis & Eaton, 1998; Samet et al. 1998; Wagstaff, 2007), the size and type of support needed by HIV-infected drug users in our study may be unique. Social support network size (rather than quality or frequency of contact) may be related to primary care use because persons with more social contacts may be better able to connect to primary care using instrumental assistance (ride to clinic, subway fare) or through knowledge of providers (Bourdieu, 1986) than persons with fewer social contacts. Recent literature on social support and HIV among racial/ethnic minorities has underscored the importance of support from families, as well as from providers and support groups (George et al., 2009; Kang, Goldstein, & Deren, 2006; Wohl et al., 2010). This was consistent with our finding that having a network member who was aware of one's HIV status was associated with greater use of primary care services. However, having other types of network members, like drug users, may be damaging or neutral to the health of HIV-infected persons (Nyamathi et al., 2000).

The concept of mutability in a behavioral model of access to health care is important for understanding social support networks as an enabling resource (Anderson, 1968). Undoubtedly, a person's social networks may change over time. Any interventions that rely on utilizing or enhancing networks to facilitate health care access cannot rely solely on the number of people in or the characteristics of the members of a social network. However, social networks can be enhanced or reinforced through interventions that are context specific (e.g., in a drug treatment facility) to improve the capacity of community-wide social networks (e.g., provide venues for information sharing and exploration of group norms that may be related to improved health care access). The latter might also occur in the context of methadone maintenance facilities, as in the present study.

Examining the relationship between social networks and health service utilization may have policy or marketing implications. For example, Deri (2005) estimated that among immigrants, increasing the number of people having a medical visit by only 1% will increase the probability of medical contact by a little more than 4%, presumably through communication among network members. Thus, Deri (2005) advocated for reaching vulnerable under-utilizing groups by advertising in local venues, such as newspapers, and at community and religious organizations. Such a strategy would have a multiplier effect, affecting both the behavior of individuals and, with their influence, members of their social networks. This type of approach might be particularly effective among HIV-infected drug users in methadone maintenance programs.

Although others have shown that drug-using networks may not be supportive (Nyamathi et al., 2000), Friedman and colleagues (2007) demonstrated that among drug users, unique social ties, channels of communication, and group norms can reduce HIV risk, a protective aspect of these social networks. Capitalizing on these ties, communication channels and group norms may lead to novel interventions. For example, peer-driven groups with empowered former drug users might be used to discuss attitudes about health care seeking, cost concerns, other types of barriers, and norms around primary care utilization. Drug treatment programs could serve as a venue for knowledge sharing. Such approaches might also engage HIV-infected persons with friends or family who are aware of their HIV status and unique health care needs, or be used to explore barriers to HIV status disclosure and encourage people to talk to their network members about HIV. Greater disclosure might then have important implications for both health service utilization and overall health status (Waddell & Messeri, 2006).

Participants in the STAR*DOT study were linked to primary and HIV care through our methadone maintenance program infrastructure (Selwyn et al., 1993). Previous research has

demonstrated that drug treatment programs may facilitate access to health care, particularly when drug treatment was integrated as part of broader case management and medical services (Knowlton et al., 2001). By comparing primary care users and non-users within this already “connected” group, we were able to demonstrate that social support was associated with primary care use even in substance abuse treatment settings with onsite medical care. Although this was a strength of our findings, it may not be generalizable to non-integrated models of care. Additionally, because all of our patients had access to health care, findings about social support networks may not be generalizable to patients who do not have access to health care or who are unable to pay for health care.

Because study participants were from one highly urbanized Eastern city, another limitation of our results is that they may not apply to the broader population of HIV-infected methadone users. In addition, our participants’ network density scores were substantially lower than among non-HIV-infected populations (Norbeck et al., 1981), and our results should, therefore, be extrapolated only to other populations with low social network densities. Additionally, because of our small sample size and cross-sectional design, the predictive value of social support network characteristics may be limited.

Despite these limitations, our study lends support to the importance of social support networks for encouraging primary care use by HIV-infected drug users. Future studies should examine potential benefits of multiple types of social support on primary care utilization. Studies that further explore these relationships could inform interventions to improve coordinated and continuous health service utilization by HIV-infected patients in outpatient drug treatment.

Acknowledgments

This work was funded by National Institutes of Health grants R01 DA015302 and R25 DA14551 awarded to Dr. Arnsten; a K23 DA021087 and a Robert Wood Johnson Physician Faculty Scholar Grant awarded to Dr. Berg; and a Center for AIDS Research grant (P30 AI051519) awarded to the Albert Einstein College of Medicine of Yeshiva University.

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Clinical Considerations

- Individual-level social support networks among HIV-infected drug users are important for encouraging primary care use.
- Because HIV-infected methadone-maintained drug users have small social support networks, expanding these networks might facilitate access to primary care.
- HIV-infected persons who enter the health care system through in-patient hospital services (rather than earlier health care) may be at increased risk for death. Therefore, interventions should be developed to increase the use of primary health care services by HIV-infected drug users.

Table 1

Demographic Characteristics of Participant, Health Service Utilization, and Social Support Network Characteristics ($n = 77$)

Characteristic	Number (%)
Age, mean (SD)	47 (7)
Male, n	41 (53)
Race/ethnicity	
Latino, n	35 (46)
Black, n	31 (40)
White and Other, n	11 (14)
Less than high school education, n	38 (49)
Employed, n	2 (3)
Medicaid as primary insurance, n	69 (90)
Stably housed, n	56 (73)
Ever incarcerated, n	45 (58)
Health status	
Poor or fair, n	29 (38)
Good, very good, excellent, n	47 (61)
CD4+ T-cell count < 350 cells/mm ³ , n	37 (50)
Duration of HIV infection, years, median (IQR)	13 (9–17)
Duration of methadone maintenance, years, median (IQR; ($n = 48$))	10 (5–16)
Case management utilization in previous 3 months, n	23 (30)
Psychological distress, ^a median (IQR; $n = 69$)	1.70 (1.30–2.21)
Self-reported substance use in previous 30 days	
Heroin, n	20 (26)
Cocaine, n	22 (29)
Crack, n	27 (35)
Hazardous alcohol use ^b , n	15 (19)
At least one primary care visit in previous 3 months, n	32 (42)
At least one emergency room visit in previous 3 months, n	18 (23)
At least one inpatient hospitalization in previous 3 months, n	14 (18)
No network members ($n = 76$), n	25 (33)
Any network members ($n = 76$), n	51 (67)
Among subjects who reported <i>any</i> network members	
Number of people in network, median (IQR)	2 (1–3)
Total support score, ^c median (IQR)	31 (21–56)
Total network score, ^d median (IQR)	15 (8–27)

NOTE: IQR = interquartile range; SD = standard deviation.

^aGlobal Severity Score from Brief Symptom Inventory, 1 = *Not at all*, 2 = *A little*, 3 = *Moderately*, 4 = *Quite a bit*, 5 = *Extremely*; 5 represents high psychological distress.

^bHazardous alcohol use defined as score of 8 or higher on Alcohol Use Disorder Identification Test.

^cTotal support score generated by summing responses to six affective, affirmative, and concrete support items in the Norbeck Social Support Questionnaire.

^dTotal network score generated by summing the number of significant persons in the network, the length of time the participant knew the network members, and how frequently the participant usually had contact with network members.

Table 2Factors Associated with Health Care Utilization ($n = 76$)^a

Odds of Attending at Least One Primary Care Visit in Previous 3 Months			
	Number of People in Network	Total Network	Total Support
Age (50 yrs)	1.96 (0.51–7.49)	1.60 (0.46–5.62)	1.68 (0.47–53.98)
Gender: Female	1.36 (0.32–5.89)	1.84 (0.48–7.07)	1.68 (0.43–6.59)
Race: Latino vs. non-Latino White	1.83 (0.31–10.83)	1.30 (0.25–6.79)	1.38 (0.26–7.37)
Race: Non-Latino Black vs. non-Latino White	0.89 (0.15–5.27)	0.79 (0.15–4.20)	0.83 (0.15–4.48)
Education: high school	4.47 (1.41–14.15)	4.01 (1.35–11.89)	3.97 (1.33–11.86)
Ever incarcerated	4.65 (1.02–21.30)	3.46 (0.88–13.58)	3.48 (0.88–13.79)
Number of people in network	2.59 (1.36–4.95)		
Total network		1.04 (0.99–1.08)	
Total support			1.02 (1.00–1.05)
Odds of Having at Least One Emergency Room Visit in Previous 3 Months			
	Number of People in Network	Total Network	Total Support
Age (50 yrs)	0.88 (0.15–5.23)	1.02 (0.16–6.48)	1.03 (0.16–6.49)
Gender: Female	6.97 (0.90–53.94)	9.04 (1.20–67.84)	8.69 (1.15–65.52)
Race: Latino vs. non-Latino White	1.45 (0.17–12.66)	1.27 (0.15–10.98)	1.29 (0.15–11.07)
Race: Non-Latino Black vs. non-Latino White	0.46 (0.04–4.80)	0.41 (0.04–4.44)	0.41 (0.04–4.40)
Education: high school	3.39 (0.75–15.24)	3.57 (0.79–16.13)	3.51 (0.78–15.86)
Ever incarcerated	8.16 (0.89–75.00)	9.58 (0.92–99.71)	9.53 (0.94–96.80)
Drug use: Crack use in previous 30 days	4.34 (0.80–23.71)	4.39 (0.77–25.02)	4.42 (0.78–24.98)
Hazardous alcohol use	4.69 (0.99–22.21)	4.47 (0.94–21.34)	4.60 (0.96–22.04)
Health status: Good – excellent	0.15 (0.03–0.76)	0.20 (0.05–0.85)	0.20 (0.05–0.84)
Number of people in network	1.57 (0.77–3.24)		
Total network		1.02 (0.97–1.07)	
Total support			1.01 (0.99–1.04)
Odds of Having at Least One Inpatient Hospitalization in Previous 3 Months			
	Number of People in Network	Total Network	Total Support
Age (50 yrs)	0.49 (0.10–2.40)	0.48 (0.10–2.40)	0.49 (0.10–2.46)
Gender: Female	2.26 (0.49–10.40)	2.54 (0.57–11.27)	2.43 (0.54–10.92)
Race: Latino vs. non-Latino White	0.62 (0.09–4.44)	0.58 (0.08–4.03)	0.59 (0.08–4.12)
Race: Non-Latino Black vs. non-Latino White	0.81 (0.11–5.88)	0.80 (0.11–5.93)	0.78 (0.11–5.71)
Education: high school	4.54 (0.83–24.75)	4.32 (0.77–24.13)	4.48 (0.81–24.89)
Ever incarcerated	0.49 (0.10–2.40)	0.48 (0.10–2.40)	0.49 (0.10–2.46)
Health status: Good – excellent	0.40 (0.11–1.48)	0.45 (0.13–1.57)	0.44 (0.12–1.54)
Number of people in network	1.21 (0.66–2.21)		
Total network		1.00 (0.96–1.04)	
Total support			1.00 (0.98–1.03)

Note: Each section summarizes results from three models estimating the effect of each factor on one of three health care utilization outcome variables: primary care use, emergency department use, or hospitalization. Within each section, each column represents a model including one of

the three social support variables: number of persons in network,^b total network score,^c or total support score.^d Significant associations are highlighted with bold type.

^aData missing for one participant.

^bAmong all subjects, the interquartile range for number of people in a network was 0–2.

^cAmong all subjects, the interquartile range for the total network score was 0–18.

^dAmong all subjects, the interquartile range for the total support score was 0–44.