

Attitudes Toward Medical and Mental Health Care Delivered Via Telehealth Applications Among Rural and Urban Primary Care Patients

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Abstract: Adequate health care services are often not available in rural and remote areas, and this problem is expected to grow worse in the near future. “Telehealth” interventions represent a strategy for addressing access to care problems. We examined and compared attitudes toward medical and mental health care delivered via telehealth applications among adult rural ($n = 112$) and urban ($n = 78$) primary care patients. We also examined attitudes toward telehealth applications among a subset of patients with posttraumatic stress disorder (PTSD)—a group likely in need of specialized services. Both urban and rural patients were receptive to receiving medical and psychiatric services via telehealth. There were few meaningful differences across variables between urban and rural patients, and there were no meaningful differences by PTSD status. These findings support the feasibility of telehealth applications, particularly for rural patients who may not otherwise receive needed services.

Key Words: Telehealth, primary care, telepsychiatry, telepsychology, rural health, access to care, patient attitudes, posttraumatic stress disorder (PTSD).

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Appropriate health care services are often not available in many rural and remote areas, and this problem is expected to intensify in the near future, exacerbating existing rural health disparities that need to be addressed (Institute of Medicine, 2004). “Telehealth” interventions represent a strategy for potentially addressing such access to care problems. Although telehealth services do not directly address overall

shortages of clinicians, they can improve access to health services in rural areas by providing a way for clinicians located in urban areas to deliver care to rural patients in relatively distant locations. Therefore, telehealth applications are becoming widely used to provide much needed medical and mental healthcare services to people in rural areas (Heinzmann et al., 2005; Jennett et al., 2003).

Recent reviews of empirical data indicate that psychiatric interviews conducted via telehealth or telepsychiatry are reliable, and that patients and clinicians who use this medium for clinical services generally report high levels of satisfaction (Frueh et al., 2000; Hilty et al., 2004; Monnier et al., 2003; Morland et al., 2003). Although this early research suggests that clinical needs might be met via telepsychiatry among mental health patients, little is known about the acceptance of such applications among broad populations. In other words, although those who actually receive telepsychiatry services are satisfied, we do not know how such services are perceived among people who are not seeking mental health treatment but who might have cause to use such services in the future. Because telepsychiatry programs are rapidly appearing all over the world, health services research that addresses the acceptance of this mode of service delivery is needed to guide development efforts for health care systems (Frueh et al., 2000; Frueh et al., 2007; Hilty et al., 2004; Monnier et al., 2003; Morland et al., 2003; Ruskin et al., 2004).

Posttraumatic stress disorder (PTSD) serves as a good test case for telepsychiatry, as this disorder is prevalent in the general population at 6% to 14% (Kaplan et al., 1994), and because (compared with other psychiatric disorders) it is associated with nearly the highest rate of medical service use (e.g., Greenberg et al., 1999; Kessler et al., 1999). Additionally, individuals with PTSD may avoid treatment since avoidance and social isolation are core features of the disorder. Thus, the impact of additional barriers to care is of particular relevance to this clinical population. To date, there is preliminary evidence to support the use of telepsychiatry for PTSD specialty care among combat veterans, including strong levels of patient satisfaction and comparable clinical outcomes with traditional face-to-face care (Frueh et al., 2007).

In a cross-sectional survey we sought to examine attitudes towards medical and mental health care delivered via telehealth applications in a sample of adult rural and urban primary care patients. We also sought to examine attitudes among a sub-

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sample of patients with PTSD, a group likely to need help accessing a range of relevant clinical services. There are no extant data on how representative patient populations, such as primary care users, view telehealth interventions. Satisfaction with care has only been documented among relatively narrow populations that have already received mental health care via telehealth. What remains unexplored is the acceptability of such services to a broad group of people who have not yet tried it but who may face real decisions about how to best access care in the future. These data should yield useful information regarding patients' beliefs toward telehealth applications and ways in which to address concerns patients may have with this mode of service delivery.

METHODS

Participants

Primary Care Patients

One-hundred and ninety-four primary care patients (138 women, 55 men, 1 unspecified) participated in this study. Participants were at least aged 18, presenting for appointments at one of 2 primary care medical clinics affiliated with a state university medical school in the Midwestern United States. Recruitment occurred in spring and summer 2005. The urban clinic was located in a city of 135,000 residents and is in a Health Resources and Services Administration (HRSA)-designated urban county (USDHHS, 2006). The rural clinic is in a town of 700 residents in a county designated as a primary care, but not mental health care, health professional shortage area by HRSA.

Participants ranged from 18 to 85 years ($M = 45.55$, $SD = 16.95$). Education level ranged from 8 to 20 years, averaging 13.89 years ($SD = 2.42$). Annual income was less than \$25,000 for 30.1% ($n = 56$), \$25,000 to \$34,999 for 18.8% ($n = 35$), \$35,000 to \$49,999 for 23.7% ($n = 44$), and \$50,000 or higher for 27.4% ($n = 51$). The majority worked full-time ($n = 104$, 54.2%), part-time ($n = 22$, 11.5%), were unemployed or retired ($n = 66$, 34.3%). Most were Caucasian ($n = 186$, 95.9%), with some Native American representation ($n = 8$, 4.1%). Ethnicity was largely non-Hispanic ($n = 174$, 92.1%). Relationship status was largely married ($n = 124$, 64.6%) or single ($n = 31$, 16.1%).

Procedures

Primary Care Patients

Primary care patients ($n = 243$) were invited to participate in clinic waiting rooms by research assistants as they presented for primary care appointments. Participants were offered \$10 compensation for participating. One hundred ninety-four patients consented, with participation response rates of 79.8% at each clinic. Participation did not vary by gender, $\chi^2(1) = 0.03$, $p > 0.05$ ($r = 0.01$). The primary reasons for declining participation were inadequate time ($n = 16$) and general lack of interest ($n = 18$). Little difference was apparent in demographics between the 2 clinics, with only race significant ($p < 0.05$, with only a "small" effect size). Of the 194 participants, 4 failed to complete primary study measures, leaving 190 participants.

Instruments

Several instruments were administered in a fixed order, taking approximately 30 minutes to complete. Of relevance to the present study, the following 4 measures are discussed.

Demographic Survey

This survey inquired about gender, age, educational level, employment and relationship status, annual income, race, and ethnicity.

Stressful Life Events Screening Questionnaire-Modified (SLESQ)

The SLESQ is a 13-item self-report scale assessing *DSM-IV*'s PTSD trauma exposure criterion A, with behaviorally specific trauma questions (Goodman et al., 1998). Test-retest reliability and convergent validity with a more extensive trauma interview are adequate (Goodman et al., 1998). In the present study, the SLESQ was used to identify an index event for the Posttraumatic Stress Disorder Symptom Scale-Self Report (PSS-SR; described below).

Posttraumatic Stress Disorder Symptom Scale-Self Report (PSS-SR)

The PSS-SR is a 17-item *DSM-IV*-based PTSD measure querying symptom frequency using a 4-point Likert scale (Foa et al., 1993). It demonstrates good internal consistency, test-retest reliability, and convergent validity with structured clinical interviews for PTSD (Foa et al., 1993). Participants were instructed to complete the PSS-SR based on their most distressing event reported on the SLESQ. PTSD diagnoses were determined based on *DSM-IV* criteria, counting a symptom present if its item rating ≥ 1 . PTSD severity is calculated by summing item responses. Because of substantial positive skewness, we added a constant ("5") and logarithmically transformed scores, creating a normal distribution of scores.

Telehealth Attitudes Questionnaire (TAQ)

The TAQ is a 23-item measure developed for the current study. The TAQ asks participants to rate their (a) comfort and confidence in using telehealth for a number of reasons, ranging from 1 = "Not at all" to 5 = "Extremely"; (b) comfort in using telepsychiatry as a medium of care or preference in using face-to-face services, ranging from 1 = "Not at all" to 5 = "Extremely"; (c) concerns regarding telepsychiatry; (d) and whether or not they have access to the different types of technology that would be relevant for using telehealth applications from home. (See Tables 1 and 2 for list of items). In the current study, the internal consistency of the TAQ was 0.88 for the total sample (0.89 for both the rural and urban groups).

RESULTS

Rural and Urban Differences in Degree of Comfort and Confidence Using Telehealth

We reviewed patients' zip codes and classified them as an urban or rural area using the US census website from 2000 (US Census Bureau, 2002). Based on the census data, 58.8% of the

TABLE 1. Rural and Urban Differences in Attitudes Toward Telehealth and Telepsychiatry Services

TAQ Telehealth Items	% Indicating "Not at All"		% Indicating "a Little Bit" or "Moderately"		% Indicating at "Quite a Bit" or "Extremely"		M (SD)		F-value, df
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	
<i>Comfort and confidence in consulting:</i>									
1. Family physician if ill	19.1	13.0	43.6	41.6	37.2	45.5	2.99 (1.30)	3.19 (1.32)	1.10, df = 1
2. Annual check-up	36.4	44.2	40.9	32.5	22.7	23.4	2.38 (1.34)	2.30 (1.40)	0.17, df = 1
3. Pharmacist consult	10.2	10.3	29.6	27.0	60.2	62.8	3.59 (1.30)	3.59 (1.27)	0.00, df = 1
4. Dietician consult	13.8	11.7	27.5	27.3	58.7	61.1	3.51 (1.39)	3.55 (1.33)	0.02, df = 1
5. Dermatologist consult	23.1	26.0	44.4	42.9	32.4	31.2	2.77 (1.39)	2.73 (1.37)	0.04, df = 1
6. Another specialist	27.5	27.3	43.1	42.9	29.4	29.9	2.62 (1.33)	2.68 (1.34)	0.07, df = 1
<i>TAQ Telepsychiatry Items</i>									
7. Comfort using telepsychiatry at local clinic	22.2	28.4	50.0	47.3	27.7	24.3	2.73 (1.30)	2.57 (1.33)	0.69, df = 1
8. Comfort using telepsychiatry at local church	32.7	37.8	52.4	33.8	14.9	28.4	2.27 (1.19)	2.47 (1.45)	1.05, df = 1
9. Comfort using telepsychiatry from home	21.3	29.3	39.9	37.3	38.8	33.3	2.99 (1.36)	2.79 (1.50)	0.91, df = 1
10. Preference for face-to-face visit	17.6	10.5	38.8	38.2	43.6	51.3	3.09 (1.34)	3.37 (1.28)	1.95, df = 1
11. Preference for telepsychiatry	31.8	40.0	52.3	46.6	15.8	13.4	2.31 (1.20)	2.11 (1.20)	1.24, df = 1
12. Use telepsychiatry if would save 1-h drive	28.0	28.0	38.3	33.3	33.7	38.7	2.74 (1.40)	2.80 (1.45)	0.08, df = 1
13. Use telepsychiatry if would save 2-h drive	25.0	27.4	30.6	26.1	44.4	46.5	3.04 (1.52)	3.11 (1.61)	0.10, df = 1
14. Use telepsychiatry in community	22.2	28.0	41.6	36.0	36.1	36.0	2.85 (1.35)	2.80 (1.47)	0.06, df = 1

Ns for telehealth items range from 108 to 110 for the rural sample and from 77 to 78 for the urban sample; Ns for telepsychiatry items range from 107 to 108 for the rural sample and from 70 to 76 for the urban sample; F-value from ANOVAs with mean TAQ scores entered as the dependent variable and rural/urban living status as the independent variable. *Denotes statistical significance at <0.05.

TABLE 2. Rural and Urban Differences in Concerns Regarding Telepsychiatry and Availability of Information Technology

TAQ Item	% Indicating "YES"		χ ² or Fisher Exact Test
	Rural	Urban	
<i>Concerns</i>			
1. Technology too sophisticated	18.8	19.2	0.01
2. Probably not helpful	7.1	5.1	0.32
3. Fear of what others would think	8.0	11.5	0.66
4. Not as effective as face-to-face	64.3	67.9	0.27
<i>Availability</i>			
1. Telephone	95.4	92.3	0.79
2. Computer	90.2	75.0	7.22*
3. Dial-up internet	36.4	43.5	0.79
4. High-speed Internet	54.8	45.5	1.36

Ns range from 88 to 112 for the rural sample and from 62 to 78 for the urban sample. *Denotes statistical significance at <0.05.

sample was rural and 41.2% was urban. For both the rural and urban participants, average ratings of degree of comfort and confidence in telehealth as a medium of care for a variety of medical services ranged from "a little bit" to "moderately," with no statistically significant differences between rural and urban participants across items (see Table 1 for ANOVA results). With regard to telepsychiatry, or the use of telehealth for psychiatric reasons, there were also no statistically significant differences between urban and rural participants (see Table 1 for ANOVA results). As with attitudes toward telehealth, mean responses across these items ranged from "a little bit" to "moderately." On average, both groups reported a comparable preference for visiting a mental health professional face-to-face rather than via telepsychiatry.

Rural and Urban Differences in Telepsychiatry Attitudes by PTSD Status

Of the entire sample (urban and rural combined), 22 (11.3%) met criteria for PTSD. Among the rural participants, there were statistically significant differences in perceived comfort using telehealth for psychiatric issues on only one item between those with PTSD (PTSD+; n = 12–13) and those without PTSD (PTSD–; n = 90–95). The rural PTSD+ group felt more comfortable using telepsychiatry if it

would save them a 1-hour drive to a clinic [$n = 12, M = 3.50 (1.45)$] compared with the PTSD- group [$n = 95, M = 2.64 (1.38)$], $F = 4.10, p < 0.05$, ANOVA. However, for the urban group, there was no significant difference between the PTSD+ ($n = 9$) and PTSD- ($n = 69$) responders on this item, or any other items. When both the rural and urban groups were combined and comparisons were made between the PTSD+ and PTSD- responders, the one statistically significant difference disappeared.

Rural and Urban Differences in Concerns Regarding Telepsychiatry and in the Availability of Information Technology

Using chi square or Fisher's exact test, there were no statistically significant differences between the rural and urban groups regarding their concerns about telepsychiatry (see Table 2). Additionally, there were no statistically significant differences by PTSD and rural/urban status across these items or by PTSD status alone without regard to urban/rural status. There was one statistically significant group difference in the availability of information technology between urban and rural participants (see Table 2). The rural group was more likely to have a home computer [90.2% ($n = 92$) vs. 75.0% ($n = 54$)], $\chi^2 = 7.22, p < 0.01$. However, there were no statistically significant differences between the groups on the availability of a telephone, dial-up Internet access, or high-speed (cable/DSL) Internet access.

Demographic Differences Across TAQ Items

We compared responses on the TAQ by gender, age, and education using mean scores for telehealth attitudes (Table 1 items 1–6 combined) and mean scores for telepsychiatry attitudes (Table 1 items 7–14 combined). Analyses were conducted for the whole sample and by rural and urban status separately using bivariate correlations for age and education and an ANOVA for gender. There were no statistically significant differences in mean telehealth and telepsychiatry attitude scores by gender. However, in both the whole sample (Corr: $-0.19; p < 0.01$) and the urban subsample (Corr: $-0.29; p < 0.05$), younger patients had more positive attitudes toward telepsychiatry than older patients. However, this difference was not statistically significant in the rural subsample. Additionally, in the whole sample, higher education was positively correlated with telepsychiatry attitudes (Corr: $0.19; p < 0.05$).

DISCUSSION

Overall, attitudes and perceptions of both urban and rural primary care patients in this sample show that they are generally receptive to the possibility of receiving medical and psychiatric services via telehealth. Comfort and confidence in consulting with a provider for a range of medical services and comfort using telepsychiatry in different settings ranged from "a little bit" to "moderately." Furthermore, there were no statistically significant differences between rural and urban participants on these items. With regard to concerns with telepsychiatry as a medium of care, only a small percentage of the sample believed that the information technology would be too sophisticated, that a telehealth application would not

help their problems and/or expressed concerns regarding what others would think.

Further supporting the feasibility of telehealth applications is the finding that the majority of patients had access to a telephone, computer, and dial-up or high-speed Internet access at home. Generally, urban and rural participants were similar with regard to the availability of these modes of communication. The only significant difference to emerge was in rural patients being more likely to have access to a computer from home. This finding is reassuring in that rural patients are likely to be comfortable using the very information technology that would be required for a telehealth intervention delivered from the home.

Of interest, more than half of patients (64.3% of rural and 67.9% of urban) endorsed the expectation that telepsychiatry would not be as helpful as a face-to-face intervention. However, it is important to remain mindful that telepsychiatry is not intended to be superior to traditional care, but rather superior to no or limited care. This argument is supported by the finding that very few participants reported that telepsychiatry would not be helpful (5.1%–7.1%). Further, 33%–38% of respondents reported being "quite a bit" or "extremely" comfortable with the prospect of using telepsychiatry from home, and almost half (44.4%–46.5%) reported being "quite a bit" or "extremely" likely to use telepsychiatry if it would save them a 2-hour drive. Thus, concern that most patients do not expect telepsychiatry to be as effective as traditional care is mitigated by the fact that most patients would be willing to try telepsychiatry anyway if it would improve their access to needed mental health services they might otherwise not receive. Further, although younger and more educated patients were more receptive to using telepsychiatry in some analyses, these differences were not found among rural patients, the ones most likely to benefit from telehealth interventions.

Some study limitations merit comment. This was a cross-sectional research design that relied on survey data. Future research designs may benefit from the inclusion of a qualitative approach to understanding patients' perceptions and concerns regarding telehealth, as well as their suggestions for making it more user friendly. Additionally, our sample was predominantly Caucasian, and thus, we do not know how these results would generalize to ethnic minority groups. Last, PTSD status in our study was derived from the PSS-SR, which is not a structured PTSD diagnostic interview. Thus, our diagnoses are tentative and additional research using more formal diagnostic assessments of PTSD and other psychiatric diagnoses may be warranted.

These data suggest that primary care patients, regardless of rural or urban living status, are at least moderately receptive to telehealth as a medium of care. Importantly, rural patients, who are more likely to benefit from telehealth interventions as a means of improving access to care, are no more reluctant to use such services than their urban counterparts. These data are all the more encouraging in light of extant data, which suggests that attitudes toward mental health use are positively associated with actual service use (e.g., Lin and Parikh, 1999; Mackenzie et al., 2004). Future research efforts are needed to develop effective strategies for

improving the acceptability and ensuring the appropriate use of telehealth care for those patients who may be positioned to benefit from it.

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