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BRIEF REPORT

The Impact of Computer Use on Therapeutic Alliance and Continuance in Care During the Mental Health Intake

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Advances in information technology within clinical practice have rapidly expanded over recent years. Despite the documented benefits of using electronic health records, which often necessitate computer use during the clinical encounter, little is known about the impact of computer use during the mental health visit and its effect on the quality of the therapeutic alliance. We investigated the association between computer use and quality of the working alliance and continuance in care in 104 naturalistic mental health intake sessions. Data were collected from 8 safety-net outpatient clinics in the Northeast offering mental health services to a diverse client population. All intakes were video recorded. Use of computer during the intake session was ascertained directly from the recording of the session ($n = 22$; 22.15% of intakes). Working alliance was assessed from the session videotapes by independent reliable coders, using the Working Alliance Inventory, Observer Form-bond scale. Therapist computer use was significantly associated with the quality of the observer-rated therapeutic alliance (Coefficient = −6.29, $SE = 2.2$, $p < .01$; Cohen's effect size of $d = -0.76$), and client's continuance in care (Odds ratio = .11, CI = 0.03–0.38; $p < .001$). The quality of the observer-rated working alliance and client's continuance in care were significantly lower in intakes in which the therapist used a computer during the session. Findings indicate a cautionary call in advancing computer use within the mental health intake, and demonstrate the need for future research to identify the specific behaviors that promote or hinder a strong working alliance within the context of psychotherapy in the technological era.

Keywords: computer use, therapeutic alliance, therapeutic relationship, intake

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Technological advances in recording, retrieving, and exchanging information have rapidly expanded over recent years. In the health care system, the electronic health record (EHR) has emerged to replace the paper chart, significantly bolstered by health safety advocacy from the Institute of Medicine (2000) and public policy that has dedicated funding for health information technology (HIT). Consequently, the use of EHRs is on the rise, having grown from 17% to 57% between 2003 and 2011 (Hsiao, Hing, Socey, & Cai, 2011), and projections indicate a continued increase in use (Blumenthal, 2009).

The documented benefits of EHR use in the practice of medicine, which almost always necessitates use of computer during patient/client visits, include improved explanations of diagnosis and treatment options (Hsu et al., 2005), increased use of provider questions to clarify information and ensure completeness of the medical record (Makoul, Curry, & Tang, 2001), and the overall quality and efficiency of care (Chaudhry et al., 2006). Improvements in scheduling and billing, communication between providers, and chart navigation have been found in medical clinics with integrated behavioral health services (Reitz, Common, Fifield, & Stiasny, 2012).

Multiple studies investigating the relationship between patient satisfaction and computer use during medical treatment have supported the claim that either no adverse effect exists or that such effect is positively correlated with treatment satisfaction (Irani, Middleton, Marfatia, Omana, & D'Amico, 2009; Koide, Asonuma, Naito, Igawa, & Shimizu, 2006). It appears that patients have embraced, or at least tolerated, the introduction of computers to the medical encounter.

Despite the identified advantages, the introduction of computer use within general health care delivery has also been accompanied by apprehension regarding its effect on the therapeutic relationship. Scott and Purves (1996) proposed that the computer becomes the third player in a "triadic" relationship that exists in EHR

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encounters, causing a fundamental change in the nature of the physician and patient relationship. Booth, Robinson, and Kohannejad (2014) rejected the ability of physicians to multitask during the visit, noting that focus on the computer may come at the expense of rapport between patient and provider. Pearce, Dwan, Arnold, Phillips, and Trumble (2009) went one step further, contending that the computer has the potential to dehumanize the medical consultation. Investigations documenting the negative impact of the mere presence of mobile phones and tablets in social interactions provide empirical support for these concerns, with lower levels of empathy, trust, and relationship quality observed when participants were engaged in meaningful conversation nearby such technology (Misra, Cheng, Genevie, & Yuan, 2014; Przybylski & Weinstein, 2013).

The practice of psychotherapy presents unique concerns regarding integrating EHR technology due to the centrality of the therapeutic relationship (Rogers, 1957), and findings that indicate the relationship itself may promote or hinder effective outcomes (Hill & Corbett, 1993; Horvath, Del Re, Flückiger, & Symonds, 2011). The working alliance (Bordin, 1979) between the therapist and client, including the creation of a therapeutic bond and an agreement of goal and task, has been found to influence the continuation and effectiveness of therapy across theoretical orientations (Constantino, Arnow, Blasey, & Agras, 2005; Crits-Christoph & Connolly, 2003), with the first session being particularly important to the development of alliance (Hartley & Strupp, 1983). The quality of the therapeutic bond between the clinician and client during the first session is a salient factor in the client's decision to continue therapy with that clinician (Principe, Marci, Glick, & Ablon, 2006). Thus, investigating the effect of introducing EHR in clinical practice is important to both the process and outcome variables of mental health counseling.

Although limited, early studies of medical visits documented increased periods of silence, delayed verbal engagement (Greatbatch, Heath, Campion, & Luff, 1995), and lower levels of patient interaction when physicians used computers (Warshawsky et al., 1994). Additional findings revealed decreased levels of overall eye contact (Chaudhry et al., 2006), with providers spending an average of one-quarter of each primary-care visit gazing at the computer screen (Margalit, Roter, Dunevant, Larson, & Reis, 2006).

Studies that have investigated the specific ways computer use impacts communication patterns in medical encounters suggest additional challenges. Computer use has been found to inhibit disclosure of necessary information due to privacy concerns (Patel, Kushniruk, Yang, & Yale, 2000), with decreases in exploring patient emotions and psychosocial issues (Makoul et al., 2001). Margalit et al. (2006) found that screen gaze correlated with decreased levels of psychosocial inquiry as well as reduced emotional responsiveness to patient concerns and overall patient-centered communication. They concluded that patients are less likely to disclose information to providers whose visual attention is on the computer screen.

While the vast majority of research on the impact of computer use has focused on primary care visits, initial studies have been conducted within the practice of psychiatry and psychology. Such studies have provided equivocal results. Kaufman & Hyler (2005) observed that in the psychiatric setting, computer use during sessions was correlated with at least minor disruptions in 44% of observed sessions, and noted that the impaired ability to detect nonverbal cues is a potential barrier to providing effective care. Given the salience of the therapeutic relationship in psychiatric practice, Stewart, Kroth, Schuyler, & Bailey (2010) hypothesized that patient satisfaction related to communication, confidentiality, and anxiety (e.g., worry about their care) would suffer within an outpatient psychiatry clinic. However, they found no significant differences between satisfaction levels prior to and following introduction of computer use. They concluded, "While other barriers to EHR adoption do exist, concerns about excessive disruption to the patient-psychiatrist relationship need not be one of them" (p. 7). However, study results were potentially confounded by a 2-year gap that unintentionally occurred between survey collection periods.

More recently, Wiarda, McMinn, Peterson, and Gregor (2014) found no differences in client-reported levels of psychotherapeutic alliance (as measured by the four-item Session Rating Scale) at a Primary Care Clinic and Community Mental Health Clinic when initial interviews were conducted with iPads and computers as compared with paper and pen. Though no outcome variable was measured, this was the first documented study reporting the effects of technology use in the alliance during the intake session. The authors called on future studies to use video recordings to observe in-session behaviors related to alliance.

The unique implications of computer use in mental health counseling remain relatively unknown given the paucity of literature in this area. The purpose of the present study was to investigate the association between computer use and the quality of therapeutic alliance between clinician and client in the initial intake session. To this end, we investigated the association between computer use during the intake and client continuance in care.

Method

Data Collection and Procedures

We report on data from the Patient-Provider Encounter Study (PPES; Alegría, Nakash, et al., 2008). The PPES used a convenience sample of therapists and clients who participated in mental health intakes. Data were collected in eight safety-net outpatient clinics in the Northeast offering mental health and substance abuse services to a diverse client population who otherwise would have experienced barriers (e.g., lack of coverage) to accessing quality mental health care. We recruited the therapist participants through introductory informational meetings. We recruited client participants through direct person-to-person solicitation as they presented for the intake visit. Client inclusion criteria were adults aged 18–65 years who did not require interpreter services. We excluded people whom the providers identified as psychotic or actively suicidal. All clients who sought mental health treatment at participating clinics and met inclusion criteria were invited to participate in the study, which totaled 173 adults. Of these, 129 participated in the study (42 clients declined to participate and 2 did not pass the capacity to consent screen). At each of the clinics, clients were randomly assigned to providers based on provider availability. To ensure the diversity of the sample, we invited therapists to participate only up to five times in the current study. The problems that clients presented were diverse and included familial and other interpersonal problems as well as major Axis I symptomatology (e.g., depression, anxiety). Intake visits ranged between 22 and 90 min, with average length of visit lasting 51.5 min (SD = 11.1).

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There were no structured protocols for conducting the intakes in any of the participating clinics. Computer use at each of the clinics included in the study was at the discretion of the clinician. All treatment rooms had computers available for use. All clinics used EHRs for charting, but clinician had choice whether to enter data during or after session. Neither clients nor therapists knew that computer use and alliance was being evaluated. All aspects of the study were approved by the appropriate Institutional Ethics Committees and data collection was in compliance with all human subject protocols.

Following the intake session which was video-recorded, participants completed a survey measure. The current sample used 104 of the 129 videotapes. Data on 25 intake sessions were excluded due to missing data ($n = 12$) or poor quality videotapes ($n = 13$). Use of computer during the intake session was ascertained directly from the recording of the session by an independent research assistant who viewed the recording.

Of the 47 providers in the original PPES, 41 participated in this study. The majority of providers were female (59.6%), 22.1% were psychologists, 28.8% psychiatrists, 43.3% social workers, and the remaining were nurses, with the majority of clinicians (70%) having more than five years of clinical practice. Approximately 52% of providers self-identified as non-Latino Whites, while 36% self-identified as Latino, and 10% as non-Latino Black.

Of the 104 clients who participated in the study, the majority were female (62.5%). Latinos represented 51% of participants, while 37% self-identified as non-Latino white, and 13% as non-Latino Black. Almost two thirds of the sample (62.5%) had 12 or more years of education and 43.3% were employed. Approximately 70% reported a personal income of less than $15,000 per year, and approximately 52% were on Medicaid.

We estimated multivariate linear regression models to examine the relationship between factors of working alliance and computer use, after adjusting for providers' clinical and sociodemographic characteristics (age, gender, years in practice, and length of interview). Our rationale for adjusting our regression for provider characteristics was based on the hypotheses that such variables would be related to provider therapeutic alliance and may confound the observed relationship between computer use and alliance. In order to test whether there were site effects for computer use that could explain alliance differences, we estimated the full model to include the random effects on provider levels.

Measures

Demographic questionnaire. A demographic questionnaire (Alegría et al., 2004) was administered to both clients and providers. Information included gender, age, race/ethnicity, and years in practice for therapists.

Computer use. Computer use was operationalized as a dichotomous variable (yes or no) depending on whether it was used at any point during the client visit.

Continuance in care (drop out). Continuance in care was defined as returning for the next scheduled visit or any subsequent visit over the following 3-month period. To determine cases where the patient did not continue care, the patient's medical records were evaluated over a 3-month period to confirm that the patient had not rescheduled or followed up later with another visit to care. This information was collected from medical records; appointment keeping was derived from clinical chart or electronic record review. Lack of continuance in care is an especially persistent source of disparities in mental health care, as it represents the failure of health care clinicians to retain patients of color in treatment after an initial visit and to not achieve the minimum dose of treatment needed for quality care (Alegría, Chatterji et al., 2008; Atdjian & Vega, 2005).

Working alliance. Working alliance was assessed directly from the session videotapes using the Working Alliance Inventory, Observer Form (WAI-O) bond scale (Bordin, 1979; Horvath, 1994). This measure has been widely used to assess quality of client–therapist relationship in different settings, including single-session encounters. The WAI-O bond scale is a 12-item 7-point Likert scale (1 = "never," 4 = "sometimes," and 7 = "always"), with higher scores indicating better client–therapist relationship. Sample items from the WAI-O include "There is mutual trust between the client and therapist" and "There is mutual liking between the client and therapist." The WAI observer form has demonstrated adequate levels of reliability and validity for measuring the therapeutic alliance (Hanson, Curry, & Bandalos, 2002; Hatcher & Gillaspy, 2006; Horvath, 1994; Horvath & Greenberg, 1989).

Three raters (graduate students and postdoctoral fellow in clinical psychology), blind to study goals and hypotheses, coded the videotapes of the intake. Training coders lasted ~10 hr. By design, the WAI-O requires no to minimal training. Overall, the training included becoming familiar with the items, ascertaining agreement on the prototypical intake session and subsequent appropriate coding, and an ongoing discussion between coders about the more difficult or challenging coding items. Three master tapes were used in the training process. After 42% ($n = 40$) of the tapes were independently coded, a follow-up coders meeting was held to assess for reliability and account for coders drift. Interrater reliability was established by having the three coders rate two intakes. The Pearson correlation of the ratings between pairs of raters ranged from 0.90–0.93.

Results

Of the 104 naturalistic intake sessions included in the current study, in 22 (22.15%) sessions the therapist used a computer during the intake. Computers were mostly used to complete forms and update patient information. Significantly more male therapists used a computer during the meeting relative to female therapists, and most therapists who used computers were younger than those who did not use computers. Table 1 presents sociodemographic information of client and therapist sample by therapist's use of computer.

In order to investigate the effect of therapist computer use on the quality of the therapeutic alliance, we conducted generalized linear regression analysis adjusting for therapists' sociodemographic variables (e.g., gender, age, and years in practice) as well for length of session that might be associated with our outcome variable. Due to the small sample size we were not able to adjust for the race/ethnicity or discipline of the therapist. Table 2 reports our main results from multivariate linear regression models. Our nested model with provider level random effects shows that therapist computer use was significantly associated with the quality of the therapeutic alliance (Coeffi-

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Table 1
Sociodemographic Information of Client and Therapist Sample by Therapist's Use of Computer During the Intake Session

	No computer use		Computer use		Total		
Patient	$N = 82$	%	$N = 22$	%	$N = 104$	%	p Value
Gender							
Male	27	32.9	12	54.5	39	37.5	.063
Female	55	67.1	10	45.5	65	62.5	
Age							
18–34 yr	33	40.2	7	31.8	40	38.5	.767
35–49 yr	32	39.0	10	45.5	42	40.4	
≥50 yr	17	20.7	4	18.2	21	20.2	
Race							
White	27	32.9	11	50.0	38	36.5	<.001
Latino	49	59.8	4	18.2	53	51.0	
Black	6	7.3	7	31.8	13	12.5	
Education[a]							
<HS	31	37.8	6	27.3	37	35.6	.553
HS/GED	17	20.7	7	31.8	24	23.1	
Postsecondary	20	24.4	6	27.3	26	25.0	
College>	13	15.9	2	9.1	15	14.4	
Employment status[b]							
Employed	38	46.3	7	31.8	45	43.3	.460
Unemployed	18	22.0	7	31.8	25	24.0	
Disabled	26	31.7	7	31.8	33	31.7	
Income[a]							
<$15k	59	72.0	14	63.6	73	70.2	.940
$15k–$35k	16	19.5	4	18.2	20	19.2	
$35k–$75k	6	7.3	2	9.1	8	7.7	
>$75k	1	1.2	0	0.0	1	1.0	
Insurance status[b]							
No insurance	4	4.9	0	0.0	4	3.8	.318
Private	9	11.0	1	4.5	10	9.6	
Medicare	14	17.1	1	4.5	15	14.4	
Medicaid	40	48.8	14	63.6	54	51.9	
Other	15	18.3	5	22.7	20	19.2	
	$N = 33$		$N = 8$		$N = 41$		
Provider							
Gender							
Male	9	27.3	6	75.0	15	36.6	.012
Female	24	72.7	2	25.0	26	63.4	
Age							
18–34 yr	22	66.7	4	50.0	26	63.4	.771
35–49 yr	9	27.3	3	37.5	12	29.3	
≥50 yr	2	6.1	1	12.5	3	7.3	
Race							
White	14	42.4	7	87.5	21	51.2	.010
Latino	15	45.5	0	0.0	15	36.6	
Asian	0	0.0	1	12.5	1	2.4	
Black	4	12.1	0	0.0	4	9.8	
Discipline							
Psychiatrist	9	27.3	2	9.1	11	26.8	.742
Psychologist	9	27.3	2	9.1	11	26.8	
Social worker	14	42.4	3	13.6	17	41.5	
Nurse	1	3.0	1	4.5	2	4.9	

[a] Two cases missing. [b] One case missing.

cient = −6.29, $SE = 2.2$, $p < .01$), such that in intakes in which the therapist used a computer during the sessions the quality of the working alliance was significantly lower ($M = 64.36$ $SE = 2.14$) compared with intakes in which the therapist did not use a computer during the session ($M = 72.28$ $SE = 0.86$), with an Cohen's effect size of $d = -0.76$. Site effects were also investigated and did not reveal any notable difference in the parameter estimates. In order to investigate the effect of therapist computer use on clients' continuance in care, we also conducted a generalized logistic regression analysis adjusting for therapists' sociodemographic variables (e.g., gender, age, and years in practice) as well for length of interview. Therapist computer use was significantly associated with client discontinuance in care (Odds ratio = .11; CI = 0.03–0.38; $p < .001$), such that clients who were seen by providers who used a computer during the interaction were between 62 and 97% less

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Table 2
Generalized Linear Model Examining Relationship Between Working Alliance and Computer Use Adjusting for Provider's Age, Gender, Years in Practice, and Length of Interview

Model	Full model with provider-level random effects
Provider's age (18–34 yr as reference)	
35–49 yr	−4.38 (2.32)
≥50	−15.31*** (4.25)
Provider's gender (male as reference)	3.65 (1.89)
Years in practice	0.44** (0.16)
Length of interview	0.01 (0.08)
Computer use (no use as reference)	−6.29** (2.23)
Constant	68.59*** (4.60)
Provider-level random effect	1.24*** (0.34)
Constant	1.87*** (0.09)
Observations	103

** $p < .01$. *** $p < .001$.

likely to continue in care compared with clients who were seen by a therapist who did not use a computer during the interaction. Specifically, of the 82 sessions that didn't involve a computer, 19 dropped out and 63 did not. Of the 22 sessions that did use a computer, 16 dropped out and 6 did not.

Discussion

We aimed to assess the impact of computer use during the mental health intake in relationship to working alliance and continuance of care. Consistent with our hypotheses, results demonstrated an inverse correlation between computer use during the intake session and the quality of the working alliance and continuance of care. This finding is significant, as, to our knowledge, no other study had examined the relationship of computer use to an outcome variable (e.g., continuance of care) within mental health counseling. The study's focus on the therapeutic relationship in the intake session may be particularly instructive in highlighting the challenges of integrating existing EHR technology while building a relationship with the client in mental health counseling.

Rapport development early in the therapeutic relationship has been observed as an important factor for retention in counseling, and conversely, for premature termination (Principe et al., 2006). It appears that when a computer was present in the intake visit, rapport development (e.g., trust, comfort, and understanding) was impeded. Consistently, clients were less likely to return after their initial appointment when a computer was used.

Although the present study serves as an important contribution to understanding the relationship between EHR technology and mental health counseling, results must be interpreted with caution. It is unclear, for example, exactly why findings contradict those observed by Wiarda et al. (2014). The source of differences between these two studies may serve to clarify potential confounding variables such that they may be addressed by future investigations. The strengths of present study included the presence of an identified outcome variable (e.g., continuance of care), as well as significantly more providers (41 compared with 10), minimizing the potential bias of therapist effects. Additionally, providers in the study conducted by Wiarda et al. (2014) may have been aware that they were participating in a technology study and thus overcompensated by attending to the client, whereas the naturalistic design of the present investigation may allow for greater genearlizability.

Alternately, strengths of Wiarda's (2014) investigation highlight limitations of the current study. As with any correlational study, the lack of controlled random assignment prevents the ability to make causal statements. It is possible that providers in this investigation with lower therapeutic alliance were simply more likely to use technology, and that the effect may actually exist in this inverse direction. Our inability to control for the specific length of screen gaze and physical distance further limited the study, whereas Wiarda et al. (2014) were able to better control for these factors. Differences observed between the two studies may have also resulted from the method of measuring therapeutic alliance (e.g., observing vs. participant rating). Any bias that raters had when they observed providers attending to the computer during the session may have confounded results. In sum, the differences highlighted between the two studies provide a direction for future work in this area.

Other limitations worth noting include the convenience sample that participated in the study. The self-selected sample is a limitation of the investigation, especially given the number of individuals who declined to participate. Furthermore, the patient population, although diverse in race/ethnicity, was mainly limited to low SES, curtailing the generalizability of our findings. The small number of providers and overall sample size, though an improvement over past investigations, restricted us from examining the effect of the individual provider related to the variables observed. A larger sample that addresses each of these challenges is needed to evaluate whether initial findings are replicable.

Additionally, the lack of established norms for the WAI prevented us from comparing our samples scores to those of the general clinical population. Despite the strengths of using observer rating scores, future studies would continue to benefit from investigating client and clinician experiences directly. Finally, there were not a sufficient number of multiply coded sessions to conduct an adequate assessment of inter-rater reliability.

In the current sample, both Latinos and individuals with low SES were represented at levels considerably higher than the general population. Studies with people of color consistently reveal dissatisfaction with the clinical encounter, particularly with provider's inattention (Morales, Cunningham, Brown, Liu, & Hays, 1999; Mulvaney-Day, Earl, Diaz-Linhart, & Alegria, 2011). Within the current investigation, computer use may have exacerbated this dissatisfaction by signaling disinterest to the patient. Future research in this area would benefit from examining whether or not specific cultural variables in racial/ethnic groups and SES may serve as moderators. It is possible that cultural norms regarding communication, eye contact, and conversation flow may be important to understanding the effect of computer use.

Whether it is possible to adopt a set of best practices in order to effectively integrate computer use into mental health counseling visits remains to be seen. Additional information about the specific behaviors that deter continuance in care and hinder the development of a strong working alliance within the context of psychotherapy warrant further exploration before discounting computer use in client sessions. Additionally, the relationship between the

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variables of working alliance and continuance of care requires further clarification.

Though much remains to be investigated, the study's findings do indicate a cautionary call in advancing computer use within the mental health intake. Practitioners using computers in the treatment room may need to reconsider the practice given its potentially harmful effect on the therapeutic relationship and treatment outcomes.

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