

Computer Use in Mental Health Treatment: Understanding Collaborative Documentation and Its Effect on the Therapeutic Alliance

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Amid increases in electronic health record adoption, many psychotherapists are concerned that in-session computing may harm the client–provider relationship, also known as the therapeutic alliance. The emerging practice of collaborative documentation (CD) is one strategy designed to prevent this outcome. Little empirical work has examined the effects of in-session computing generally or CD specifically within the psychotherapeutic context. This study explores how CD is being implemented in psychotherapy and examines how both the frequency of computing and the use of CD affects the therapeutic alliance. Psychotherapists in this study engaged in an average of 42 ($SD = 38.5$) computing episodes. CD was present in 39% of sessions ($N = 21$). Regression models found that among providers, increases in computing frequency predicted decreases in alliance ($B = -.18, p < .05$). Conversely, among clients, the use of CD improved alliance ($B = .43, p < .01$). Findings suggest that psychotherapists use computers often, but parties view the effect of electronic health records differently. Reconciling this disparity and continuing to develop effective technology-based best practices is imperative.

Clinical Impact Statement

Question: This study examines how both the frequency and manner of computer use during psychotherapeutic sessions affects client and provider ratings of the therapeutic alliance. **Findings:** Findings suggest that clients and providers view the impact of in-session computing differently; when used collaboratively, computers may enhance client ratings of alliance, while providers associate increases of computer use with lower ratings of alliance. **Meaning:** Understanding differential responses towards in-session computer use can help guide providers' decision-making related to effective use of technology in treatment. **Next Steps:** Additional work is needed to better refine approaches toward collaborative computer use, including the identification of mechanisms that will support providers in this practice.

Keywords: electronic health records, therapeutic alliance, collaborative documentation, psychotherapy

Electronic health records (EHRs) are increasingly used in mental health settings. A survey of mental health clinics found that as of 2012, 56% report having adopted a system, with another 26% planning to transition to an EHR in the near future (National Council for Community Behavioral Healthcare, 2012). Although this transition promises to transform our mental health care system in many ways, one important consideration is how these systems affect both the client and provider experience at the point of care. As EHRs are becoming more embedded into routine workflows, providers must increasingly attend to these systems during clinical encounters. Consequently, many providers adapt their existing practice behaviors and work patterns to accommodate the use of the EHR system (Booth, Robinson, & Kohannejad, 2004). Effectively negotiating this change has been a salient concern among

mental health providers, with many professionals worrying that the use of computers during visits will diminish their ability to build rapport and establish a working relationship with clients (Craig & Calleja Lorenzo, 2014; Shank, Willborn, Pytlkzillig, & Noel, 2012). This concern holds particular import in the context of psychotherapy, as the development of a positive working relationship, commonly referred to as the therapeutic alliance, has consistently been found to be one of the most robust and consistent predictors of positive outcomes in treatment (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000).

Despite its centrality to the quality of psychotherapy, research examining the effect of EHR use on the therapeutic alliance extremely limited. Presently, only two studies have explicitly examined this association, and they have produced conflicting outcomes. First, Wiarda, McMinn, Peterson, and Gregor (2014) found no difference in client-reported alliance between sessions in which paper and pen, iPad tablets, and computers were used. Conversely, Rosen, Nakash, and Alegría (2016) found that compared with those in which paper and pen were used, observer ratings of therapeutic alliance and client continuity in care were lower in mental health intake appointments when computers were

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used. Interpreting the implications of these disparate findings is complicated by the fact that client and observer ratings of alliance cannot easily be directly compared, as scores have been found to vary as a function of the rater completing the scale (Elvins & Green, 2008). Consequently, more research in this area is needed to build greater clarity and consistency surrounding the relationship between EHR use and alliance building in psychotherapeutic work.

A more substantial body of research examining the effect of EHR use on patterns of communication exists in the medical literature. Though distinct in many ways from psychotherapeutic treatment, the medical literature offers additional insight into how in-session computing affects patient–provider communication in unique but related contexts. A concise review of this work is presented here, with particular attention to indicators uniquely relevant to alliance-building activities that occur in psychotherapeutic contexts.

Consistent with the studies occurring in mental health settings, research in medical practice has also yielded mixed results about how in-session computing affects important indicators of the client–provider relationship. Particularly relevant is that increase in computing has been found to decrease the frequency of medical providers' psychosocial questioning and overall emotional responsiveness to patient-stated concerns (Margalit, Roter, Dunevant, Larson, & Reis, 2006; Street et al., 2018). Multiple studies have also noted an association between EHR use and reduced eye contact with patients (Asan, Young, Chewning, & Montague, 2015; Margalit et al., 2006; Shachak, Hadas-Dayagi, Ziv, & Reis, 2009), more time spent turned away from patients (McGrath, Arar, & Pugh, 2007; Noordman, Verhaak, van Beljouw, & van Dulmen, 2010), and an overall decrease in dialogue during appointments (Bartels, 2017; Margalit et al., 2006; Noordman et al., 2010; Street et al., 2014). Contrary to these negative findings, several studies have also indicated that physicians using EHR systems provide clients with *more* information about their health status, such as medication adherence (Makoul, Curry, & Tang, 2001; Margalit et al., 2006), and compared with those using paper charting, physicians may ask more questions of their patients, including requests to confirm or clarify information entered into the chart (Makoul et al., 2001).

Collectively, this body of work offers inconclusive findings related to the impact of in-session computer use on the therapeutic alliance, particularly within psychotherapeutic treatment. These disparate findings may be partially attributed to the consistent failure to account for any variation in the way EHRs were being used within the sampled visits. Existing research has primarily examined *if* and *how often* EHR systems are used during visits, however, several studies have also established that providers adopt a wide range of computing behaviors during client encounters (Asan & Montague, 2014; Booth et al., 2004; Fitter & Cruickshank, 1982; Ventres, Kooienga, Marlin, Vuckovic, & Stewart, 2005). It is therefore possible that the client–provider relationship is not simply impacted by how frequently computers are used but also by the manner in which the system is integrated into visits. Thus far, little is known about what computing behaviors are used by psychotherapists specifically, and there has been no work that has demonstrated the association between specific computing behaviors and key clinical processes or outcomes in any clinical setting. Consequently, systematically identifying discrete computing behaviors that occur during psychotherapy visits and examin-

ing the effect of these strategies on the therapeutic alliance may contribute to a more nuanced understanding of the relationship between in-session computing and the client–provider relationship.

Although little is known about what may constitute optimal computing behaviors from an empirical perspective, collaborative documentation (CD) is one emerging practice that provides guidelines for in-session computing in mental health specifically, providing a useful framework for advancing this particular line of inquiry. CD refers to the practice of using EHRs to deliberately complete progress notes jointly with clients during psychotherapeutic encounters (Stanhope, Ingoglia, Schmelter, & Marcus, 2013). CD is framed as a mechanism to promote a client-centered approach to care (DiCarlo & Garcia, 2016); by deliberately including clients in the documentation process, it is expected that clients are given the opportunity to provide input about their treatment progress, thereby facilitating a mutual understanding of important psychotherapeutic issues and goals. In doing so, it is also anticipated that CD will enhance the therapeutic alliance by increasing client engagement and participation in treatment (Hirsch, 2012; Schmelter, 2012).

Though CD intends to use the EHR as a tool to enhance the therapeutic alliance, this practice has yet to be empirically tested for effectiveness and has not undergone systematic implementation or fidelity trials that illustrate how CD is being deployed by providers (DiCarlo & Garcia, 2016). Stanhope and colleagues (2013) have conducted the only study to explicitly examine CD. This research found that training clinicians on several person-centered interventions, including CD, was associated with increased treatment compliance. Notably, because clinicians were trained in multiple approaches, the unique effect of CD on this outcome remains unknown. Related research has also found that having electronic access to their mental health treatment notes can improve clients' sense of self-efficacy in treatment (Peck, Torous, Shanahan, Fossa, & Greenberg, 2017), increase trust in their mental health provider, and improve rates of perceived treatment efficacy (Dennison, Pisciotto, Hooker, Trevino, & Dobscha, 2019), but the effect of moving note-sharing activities into the therapeutic session itself remains unknown. Although these studies suggest that CD may be an effective alliance building tool, this hypothesis has yet to be empirically tested.

In sum, more work is needed to establish the effect of in-session EHR use on the therapeutic alliance within the unique context of psychotherapeutic treatment. A thorough examination of this question requires exploration of both the frequency and method of in-session computer use. The emerging practice of CD offers a framework for characterizing optimal methods of computer use, though empirical work related to the development, implementation, and effectiveness of this model is presently underdeveloped. To address these gaps in the literature, the following study is guided by three objectives: (a) to examine the frequency of EHR use during psychotherapeutic sessions, (b) to describe which CD strategies are implemented in practice, and (c) to examine the association between the frequency of computer use, the use of CD, and the therapeutic alliance in psychotherapeutic treatment.

Method

Study Design and Procedure

This study was conducted in a large community health and mental health center. The host organization provides a broad range of medical and psychosocial services to a primarily underserved population in an urban area. At the time of this study, all departments in this organization had been using a single EHR for over 15 years, which provided the opportunity to explore computing behaviors in an environment where EHR systems have been comprehensively integrated into routine care. Although nearly all of the organization's operations were electronic, there were no policies articulating how often and in what ways providers used the EHR during clinical encounters, leaving these decisions to the discretion of the individual providers. All mental health providers received a standardized training in CD but were not required to implement CD or utilize the EHR during clinical sessions. Cross-sectional data were collected from three sources: video-recorded psychotherapy sessions in which computers and EHRs are present, brief client surveys, and brief provider surveys.

Individual psychotherapy sessions were recorded using a tripod-mounted video camera. Video equipment was assembled in a designated clinical office space and was positioned to capture the provider, client, and the computer in the frame. No members of the research team were present in the room during the recording process. At the conclusion of each psychotherapy session, both the client and provider completed a brief survey containing quantitative measures of therapeutic alliance. All study procedures were approved by an institutional review board at both Elizabeth B. Matthews' affiliated university and host organization.

Recruitment

Participants recruited for this study included direct service providers employed within the behavioral health services department of the host organization and clients receiving therapeutic services in the psychosocial services department. To be eligible for participation, providers were required to be licensed mental health professionals who provided ongoing therapeutic services. This included social workers, licensed counselors, and psychologists (PhD and PsyD). Eligible clients included adults (age 18 and over), English-speaking individuals actively receiving ongoing psychotherapeutic services in the psychosocial services of the target organization.

Recruitment was conducted in two phases, with the first phase focused on identifying the provider sample. The approach to recruitment was informed by the objectives of this study, specifically the intent to describe how CD was being implemented in clinical practice. To facilitate this, providers were recruited using a purposive, nonproportional quota sampling approach that targeted providers who self-reported implementing CD in practice. This method of sampling is used to nonrandomly target participants based on predefined criteria and is useful when smaller subgroups, such as sessions where CD is present, are of particular interest (Trochim & Donnelly, 2008). This information was gathered from an electronic report, tracking the provider's self-reported use of CD during each session. At the completion of each progress note, providers were asked to check a box if CD was used during

that particular visit. A 3-month average of this data was compiled to identify the highest self-reported utilizers of CD. Provider recruitment began with the highest self-reported implementers of CD and progressively worked through the list of eligible providers until saturation of the sample population occurred. By overrepresenting providers who endorsed the use of CD, this recruitment approach was expected to increase the capacity to examine if and how CD practice strategies were being incorporated to session activities. A total of 13 providers agreed to participate in this study.

The second phase of recruitment targeted the client sample using a convenience sampling approach. Each participating provider first selected preferred dates for data collection. All clients scheduling appointments on this preselected date were notified about the study in advance, enabling individuals to opt out by scheduling appointments on a different day. On the day of data collection, the principal investigator was stationed in the waiting room to recruit eligible clients as they arrived for their scheduled appointments, including clients who were notified in advance as well as those who presented for walk-in appointments. Informed consent for participation was obtained at that time. A total of 68 clients were approached for participation, and 10 declined, for a resulting sample of 58 clients.

In summary, the study sample consisted of 58 clients across 13 providers. One psychotherapy session per client ($n = 58$) was video recorded. On average, four visits per provider were video recorded, with a minimum of three and a maximum of six. At the conclusion of study participation, clients were given \$20 in cash, and providers were provided with a \$50 gift card.

Measures

Computing frequency. Computing frequency was measured from video-recorded psychotherapy sessions. All videos were uploaded into Atlas.ti to facilitate coding. The frequency of computer use was measured by counting the number of "computing episodes," or unique instances of computing, that occurred during each session. Guided by an existing precedent (Dowell, Stubbe, Scott-Dowell, Macdonald, & Dew, 2013), a computing episode began when a provider interacted with the computer in any way, which included (a) gazing at the computer screen, (b) moving or touching the mouse, or (c) striking keys on the keyboard. A computing episode ended as soon as the provider was no longer looking at or touching the computer in any way. The total computing episodes were summed for each session, creating a continuous variable reflecting the total amount of computing. To facilitate a more meaningful interpretation of this variable, computing frequency was standardized in the final analysis.

Collaborative documentation. The conceptual model of CD utilized in this study was inductively developed in a previous, qualitative study situated in the same host organization (Matthews, 2017). The core components composing CD are outlined in Table 1. A third-party global rating system was developed for the purpose of this study to measure the components of CD as described in Table 1. This approach has been used to measure the adoption of complex, multidimensional clinical practices (Moyers, Manuel, & Ernst, 2014), making it suitable for the purposes of this research. Using a 5-point Likert scale, an independent observer scored each session on its use of each of the four dimensions considered critical

Table 1
Framework for Collaborative Documentation

Dimension	Behavior
Prompt	Alerting clients that documentation is about to occur by providing verbal alerts or prompts before computing
Dictation	Sharing the progress note narrative by reading out loud either as it is being written or shortly thereafter
Eliciting feedback	Offering clients the opportunity to confirm, approve, add to, correct, or otherwise contribute to the progress note narrative
Screen sharing	Physically adjusting the screen to provide visual access combined with a verbal or nonverbal invitation to jointly view the computer together

to this practice (prompting, screen sharing, dictation, and eliciting feedback). Responses ranged from 1 (*absent during session*) to 5 (*consistently utilized throughout the session*). To establish reliability of this method, 20% ($n = 12$) sessions were cocoded by a research assistant. Intraclass correlation coefficient (ICC) estimates and their 95% confidence intervals [CIs] were calculated, with results suggesting excellent reliability of this scale (ICC = .95; 95% CI [.81, .99]; Koo & Li, 2016).

An overall CD value was generated by calculating the mean score across three dimensions (prompting, dictation, and feedback). Screen sharing was omitted, as providers infrequently deployed this strategy ($n = 7$ sessions), and reliability analyses reflected that reliability coefficients were improved when this dimension was dropped from the mean score calculation. The overall scale therefore reflects the mean score of global ratings related to dictation, prompt, and feedback. ICC estimates using 95% CI's demonstrated adequate reliability (ICC = .85; 95% CI [.76, .91]).

Because a primary objective of this study was to examine the effect of these collective behaviors on the therapeutic alliance, it was important to identify the sessions that most fully exemplified CD in practice. In the absence of established guidelines for measuring CD implementation, a norm-referenced approach, in which the performance of a single target is compared against that of a larger group (Glaser, 1963), was used to identify such visits. Consistent with this method, individual sessions with CD scores at or above the 75th percentile were therefore considered sessions where CD was deployed.

Therapeutic alliance. Therapeutic alliance was measured using the Working Alliance Inventory (WAI)–Short Form (Tracey & Kokotovic, 1989). The WAI-Short Form is an abbreviated version of the 36-item WAI developed by Horvath and Greenberg (1989). The WAI-Short Form consists of 12 items answered using a 7-point Likert scale and produces both a total alliance score in addition to subscale scores for three domains of alliance: task, bond, and goals (Bordin, 1979). The WAI-Short Form was adapted to measure alliance from both the client and provider perspective. Ratings of alliance have been shown to vary between these two parties (Fenton, Cecero, Nich, Frankforter, & Carroll, 2001; Meier & Donmall, 2006; Tryon, Blackwell, & Hammel, 2007), with clients commonly reporting stronger alliance than providers (Hilsenroth & Cromer, 2007; Tryon et al., 2007). Consequently, this study measured alliance from both the client and provider perspectives to provide a more robust, triangulated picture of these associations. In the study sample, composite scores from both the client (ICC = .83; 95% CI [.75, .90]) and provider (ICC = .89; 95% CI [.84, .93]) versions of the WAI demonstrated strong reliability, as measured by ICC estimates with 95% CIs.

Covariates. Client-level factors known to affect either the independent or dependent variables were included as covariates in this model. Because symptom severity may negatively affect both client (McCabe & Priebe, 2003) and provider (Couture et al., 2006) ratings of therapeutic alliance, analyses controlled for the presence of a serious mental illness, which included any psychotic disorder or bipolar disorder. In addition, studies have found the beginning stages of psychotherapy to be critical in the development of “early alliance,” after which point the established relationship may stabilize (Elvins & Green, 2008). Although this is traditionally defined as within the first 3 months of treatment, analyses controlled for clients enrolled in treatment for less than 6 months, as the number of clients within the first 3 months of treatment was too small to provide a meaningful comparison category. Preliminary, bivariate analysis indicated that significantly more computer use was evidenced in assessment visits ($n = 5$); therefore, a dichotomous variable distinguishing assessment visits versus ongoing visits was included in the model. Lastly, client demographics, including age (in years) and race/ethnicity (White, Hispanic, African American, and other) were included in the analysis.

Analysis

Univariate statistics were used to describe the extent of computer use in sessions, as well as the use of CD strategies. Because session-level data were nested within providers, preliminary analyses explored the role of provider-level differences in the independent variables of interest. Results from a one-way analysis of variance indicated significant between-provider differences in computing frequency, $F(12, 40) = 5.51, p < .001$, and CD, $F(12, 40) = 3.19, p < .05$. ICC estimates from a mixed effects model were then used to better understand the degree of between provider variation in computing frequency and CD. Results indicate that providers account for a moderate amount of variation in computing frequency (ICC = .43; 95% CI [.19, .70]), but less variation in CD (ICC = .29, 95% CI [.08, .65]).

Given these findings, analytic models included computing frequency and CD as independent variables and examined their association with therapeutic alliance using a mixed-effects linear regression model, which included a random intercept at the provider level. This random component was included in the model to adjust for variation due to between-provider differences. Separate analytic models examined the unique relationship of each independent variable on both the client and provider rated alliance scores, followed by a fully adjusted model containing both independent variables. Consistent main effects were found across all iterations, and therefore the fully adjusted model is reported.

Listwise deletion was used to manage missing data. Data quality issues resulted in the exclusion of alliance inventory response from four clients within the sample. These cases were subsequently removed from analyses using client-reported data reported in this section. All “don’t know” responses related to perceived computer use were also treated as missing.

Results

Sample Demographics

A total of 13 providers participated in this study. All providers held a Master of Social Work degree. Just under half of this group identified as White (46.2%), whereas just over 30% reported Hispanic descent. The majority of recruited providers were female (69.2%) and between the ages of 25 and 39 (76.9%). On average, providers had been in the field of behavioral health for just under 7 years ($M = 6.8$, $SD = 5.7$).

A total of 58 clients were recruited for the study, each of whom participated in one videotaped psychotherapy session. Of these 58 sessions, five were excluded because of quality issues (video recording cut off prematurely and provider out of frame), for a total analytic sample of 53 clients. Overall, the client sample ($N = 53$) was well educated; the majority (58.5%) had at least some college. Only a small percentage of the clients self-identified as White (13.2%), with most reporting either Hispanic ethnicity (43.4%) or African American descent (32.1%). The client sample was evenly split between male (49.1%) and female (50.9%) respondents. Most clients fell into either a 25 to 39 (37.7%) or 40 to 59 (37.7%) age bracket. Diagnostically, just over a quarter (28.3%) met the criteria for a serious mental illness, which includes any psychotic disorder and bipolar disorder.

Computing Frequency and CD

On average, providers engaged in 42 ($M = 42$, $SD = 38.5$) computing episodes, each of which reflects a unique episode of computer use. Notably, although in-session computing was not a requirement of the organization, it was present in all 53 sampled sessions, with a minimum of two computing episodes observed. In addition, of the 53 visits included in the sample, CD was present in 21 (39% of sampled sessions).

Table 2 provides illustrative examples of how each CD strategy manifested in sessions. Prompting was the most commonly utilized strategy and was employed at least once in all 21 sessions using CD. As intended, this strategy was often deployed in tandem with a physical change in body posture away from the client and toward the computer. Psychotherapists used prompts to either explain to the client what they were actively doing in the EHR, for example, “I am pulling up your chart now” or to prepare them for an imminent focus on attending to the computer: “I am going to write this down in the computer.” Dictation was also nearly universal, being used at least once in 90.5% of these sessions. Most commonly, providers deployed this strategy by reading aloud as they typed information into the chart. Finally, feedback was used in over three quarters (76.2%) of sessions and was primarily used to confirm the accuracy and acceptability of documentation that had been entered into the chart. The majority of sessions (76.2%) deployed all three of these CD strategies at least once, and they were often used in conjunction with one another. For example, one provider dictated her own note as she typed, pausing to ask the client, “How would you word that?” Bivariate analyses compared client- and session-level differences between visits when CD was considered present or absent, but no significant differences were found.

Table 2
Examples of Collaborative Documentation Practice Strategies

CD dimension	Example 1	Example 2
Prompt	Provider: [turning to computer] Okay. So I’m just gonna write that down as something that we’ll work on. (Session 0801)	Provider: All right. So let me just start your note and stuff here, double check if I have anything to do for you. Do you have any questions for me as I just kind of click on some of these things? (Session 0501)
Dictation	Provider: So, I’m just writing that, along with discussing how you’re gonna feel about seeing [the psychiatrist], we’re gonna talk about other options to help you sleep so that you’re also more empowered. . . . [aloud while typing] “Other options to help her sleep to feel more empowered.” Client: Okay. Sounds good. (Session 0803)	Provider: Okay. So I have to summarize it up now that you reported [aloud while typing] “feeling great because you went to church after being away for 18 months, uh, explored your feelings about being in church and patient reported sense of belonging and joy.” Client: Yes. Big Time. Provider: Right . . . [aloud while typing] “Writer offered alternative of doing over worrying about feelings as patients misery leads to inactivity which causes more worry.” Does that make sense? Client: Wow. Pinpoint out everything. My goodness. (Session 1001)
Feedback	Provider: Okay. So let’s get this down [in your note], actually, because this is actually good, . . . [aloud while typing] “So these are triggers that cause me to feel bad or set me off”. . . . So it sounds like the newest trigger is sort of see . . . How would you word it, when you see your daughter and her husband’s relationship affecting your grandchildren? How would you word that? ‘Cause I want to put it in my notes. (Session 0203)	Provider: Okay, [aloud while typing] “At least three times a week when I’m upset about some work. I’ll use the breathing technique at least three times a week to,” How should I phrase it? [aloud while typing] “to deal with stress- Client: And mood swings. Provider: [Nods, aloud while typing] “to deal with stress and mood swings.” (Session 1301)

Relationship Between Computing Behaviors and Therapeutic Alliance

A mixed-effects regression model examined the association between the frequency of computer use and the deployment of CD on alliance. Although both client ($M = 6.5$, $SD = .59$) and provider ($M = 5.8$, $SD = .67$) ratings of alliance were high, analyses found distinct, statistically significant associations between the frequency computer use, CD and the therapeutic alliance among both groups. These findings are summarized in Table 3. For providers, increases in computing frequency were associated with a decrease in provider rated alliance ($\beta = -.18$, $p < .05$). CD did not significantly affect their ratings of alliance. Conversely, among clients, CD increased perceived alliance ($\beta = .43$, $p < .01$). Contrary to the provider model, the frequency of computing was not found to significantly affect alliance. In the client-rated model, African Americans ($\beta = .58$, $p < .01$) and clients of other races ($\beta = .82$, $p < .05$) reported stronger working alliances than White client respondents.

Discussion

These findings suggest that in-session computer use was common in this behavioral health setting; all providers in the sample used the EHR during their sessions and, on average, demonstrated 42 unique instances of computing throughout the session. As the first study to examine the frequency of computer use in psychotherapeutic contexts, these findings provide novel insight into the prevalence of EHR use in psychotherapeutic work.

One objective of this study was to explore and describe how CD strategies are being implemented in practice. In this sample, the highest CD implementers utilized three out of the four core strategies embodied in this practice: prompting clients before computer use, eliciting client's feedback and input throughout the process of clinical documentation, and providing verbatim or summative feedback regarding the content of the record. The process of computer screen sharing was rare in this sample. Screen sharing has been cited as a promising best practice for inclusive in-session

computing (Alkureishi, Lee, & Frankel, 2017), with some evidence suggesting a client preference for this activity as well (Lee et al., 2016). Despite this, the relative infrequency of this practice has been noted in health care settings as well (Milne et al., 2016). Further exploration of barriers preventing more widespread use of this practice may therefore be warranted, as it may further enhance any positive effects of CD.

Results further indicate that both providers and clients in the sample endorsed strong working relationships. Interestingly, non-White clients endorsed higher alliance scores, which represents a departure from existing research finding racial minorities are generally less satisfied with their mental health care and more likely to disengage from services than white clients (Maura & Weisman de Mamani, 2017). Despite these generally favorable ratings of alliance, these parties perceived the effect of in-session computer use and CD on the working relationship differently. Among clients, there was a positive relationship between CD and therapeutic alliance, but no statistically significant relationship between alliance and the frequency of computing. Conversely, provider ratings of alliance were negatively associated with computer use but were not affected by the use of CD. This suggests that, among this group, although providers may perceive that computer use harms the quality of the working relationship, quite the opposite may be true for the recipients of technologically driven care.

The nature of this disparity is reflective of trends found elsewhere in the literature; among medical and behavioral health professionals, concerns about the client-provider relationship are a commonly cited source of resistance toward widespread EHR adoption (Ajami & Bagheri-Tadi, 2013; Craig & Calleja Lorenzo, 2014; Gadd & Penrod, 2000; Zhang et al., 2016). Despite providers' concerns about these negative outcomes, studies exploring the client perspective in both mental health and medical contexts suggest that end users generally have favorable opinions toward the integration of technology, including EHRs, into their care. For example, a qualitative study by Cromer and colleagues (2017) found that clients believed EHRs could improve their mental health care by enhancing trust in their provider and improving the

Table 3
In-Session Computing and Client and Provider Alliance

Model variables	N	Percentage	M	Association with provider-rated alliance ^a N = 53	Association with client-rated alliance ^a N = 48
Collaborative documentation	21	39.6	—	0.18	.43**
Computing frequency ^b	53	—	42.0 (38.5)	−0.18*	.04
Age (years)	53	—	42.6 (14.2)	0	0
Early treatment	20	37.7	—	−0.13	−.19
Serious mental illness	15	28.3	—	−0.12	.05
Assessment visit	5	9.4	—	0	−.3
Race					
African American	17	32	—	0.18	.58**
Hispanic	23	43.4	—	0.13	.41
White	7	13.2	—	ref	ref
Other	6	11.3	—	0.35	.82*
Some college	31	58.5	—	−1	.13
Female	27	51.0	—	−0.16	−.21

^a Figures represent beta coefficients from a fully adjusted model. ^b Variable standardized in regression analysis.

* $p < .05$. ** $p < .01$.

transparency in treatment. Reinforcing this point, a recent systematic review on the effect of EHR use on the doctor–patient relationship found no change in overall patient ratings of satisfaction or quality of communication (Alkureishi et al., 2016). Similarly, clients have described health information technology in general as a way to increase access to mental health treatment, both by reducing the stigma associated with receiving treatment and making it easier to reach providers for both urgent and nonurgent issues (Forchuk et al., 2015).

Because it can be expected that EHR use in behavioral health settings will continue to proliferate, it will be critical to better understand factors influencing both client and provider attitudes toward technology. Although these findings seem to support the hypothesis that CD improves alliance from the client perspective, this study cannot articulate the particular benefits clients derived from this practice. Of concern, related research has suggested that although clients responded favorably to having electronic access to their mental health treatment notes, (Denneson, Cromer, Williams, Pisciotta, & Dobscha, 2017; Peck et al., 2017), there were unintended consequences of this transparency that undermined the quality and accuracy of the clinical documentation. To avoid conflict with clients who have access to their mental health notes, clinicians increased the vagueness of their documentation and omitted details, including clinically relevant information, that they perceived may be controversial or upsetting if read by the client (Denneson et al., 2017; Dobscha et al., 2016). Although this may be an effective mechanism to preserve a harmonious therapeutic relationship, incomplete or inaccurate clinical notation will ultimately be detrimental to the quality of care. Considering this evidence, it is possible that clients were accepting of CD not because it facilitated transparent discussion but because it minimized it. Though well received by clients, it will be important to ensure that CD does not ultimately undermine the occurrence of honest dialogue between provider and clients by tacitly encouraging providers to avoid difficult conversations or acknowledge disagreements. It is recommended that ongoing efforts to train providers in CD proactively acknowledge the potential for difficult discussions to arise, and equip providers with skills and strategies to broker disagreements or sensitive topics collaboratively in their documentation.

Relatedly, the provider's pessimism related to in-session computer use found both in this study and within the broader literature may provide some indication that psychotherapists may not feel adequately equipped with the knowledge and/or resources needed to negotiate in-session computing. Recent work has established that EHR adoption has increased the administrative demands placed on providers (Matthews, 2017; Shanafelt et al., 2016). This burden may be acutely felt within the context of CD in particular, as this practice inherently brings administrative work into the clinical encounter. Although promoted as a mechanism to engage clients and foster therapeutic alliance, it is important to note that another primary function of CD is to improve providers' productivity by increasing efficiency in documentation and reducing administrative time that occurs outside of client care (Hirsch, 2012; Schmelter, 2012). The prevalence of burnout among behavioral health providers, caused in part by heavy workloads in a demanding, face-paced work environment, is a well-documented concern in the profession (Diaconescu, 2015). Rather than a remedy to these issues, it is possible that the introduction of CD is

perceived as an exacerbation of these existing challenges by further diminishing administrative downtime and adding additional skills and responsibilities to an already overwhelmed workforce. Efforts to explore and respond to the root causes of provider's skepticism toward in-session computing may facilitate efforts to develop and disseminate practices such as CD in a way that is both acceptable and useful to providers.

Collectively, these findings have several implications for practice. Although both client and provider perspectives should be used to shape how models of CD are developed and disseminated, in adult populations, client ratings of alliance are more predictive of outcome than those of providers' (Elvins & Green, 2008; Horvath & Symonds, 1991). Consequently, designing and implementing practice strategies that are responsive to clients' preferences is essential to improving the quality and effectiveness of care. Because of the limited size and scope of this study sample, additional replication of these findings is warranted before determining whether CD should be considered a best practice for in-session computer use. However, this study does offer information that may be useful to clinicians confronted with decisions about how to use computers in psychotherapeutic work. Specifically, findings from this study provide preliminary evidence that although the overall frequency of computer use may not necessarily be detrimental to clients' perception of alliance, the collaborative nature of computer use could affect the client–provider relationship. This provides preliminary support for the utility of CD as a practice strategy. Furthermore, though providers routinely express concern that in-session computing will be detrimental to the client–provider relationship, this study did not find evidence supporting this worry. It is therefore recommended that when interfacing with the computer, providers remain acutely attuned to the response of the individual client before determining whether this practice is benefiting or harming the therapeutic relationship.

This study has several limitations. First, the number of unique providers included in the sample was relatively small. This precluded exploration of provider-level factors known to influence the quality of the working relationship from both the provider and client perspective, such as clinical experience and perceived competence (Ackerman & Hilsenroth, 2003; Hersoug, Høglend, Monsen, & Havik, 2001). Similarly, the psychotherapists composing the provider sample were all social work professionals. Therefore, although the demographics of this group are fairly reflective of the social work workforce specifically (Salsberg et al., 2017), this is only a subset of the broader field of mental health professionals. For this reason, future work would benefit from examining whether these patterns persist across a more diverse group of mental health providers or, similarly, whether there is within-group variation in the profession.

Another limiting factor of this study design was the inability to limit the sample visits to those in early stages of treatment, as research suggests that the process of relationship building is most variable in the first 3 months of treatment (Crits-Christoph, Gibbons, Hamilton, Ring-Kurtz, & Gallop, 2011; Hilsenroth & Cromer, 2007). To address this, the final analysis accounted for time in treatment but was unable to uniquely examine predictors of alliance ratings in the first 3 months of care. Future work would benefit from more deliberately exploring the unique effect of CD on alliance in early stages of treatment or at multiple time points in care.

In addition, the known discordance between client and provider ratings of therapeutic alliance (Fenton et al., 2001; Meier & Donmall, 2006; Tryon et al., 2007) has important implications for the interpretation these findings. That clients are known to rate the quality of their relationship more positively than providers illustrates the highly subjective nature of this construct and establishes that these parties often experience psychotherapeutic work differently. Consequently, these findings cannot be used to make comparative judgments about how these parties view computer use relative to one another (i.e., whether clients view CD as *more* beneficial than providers). Furthermore, as there are many factors known to influence both provider and client ratings of alliance (Elvins & Green, 2008), it is acknowledged that the association between EHR use, CD, and alliance is likely much more complex than articulated by these findings. Despite this, the opposing directionality of the associations between the independent variables and the client and provider alliance ratings offers valuable insight into how each party uniquely views the role of computer use within the clinical encounter. A more complete and precise understanding of this apparent disparity between psychotherapists and clients could be accomplished through explicit examination of client and provider concordance in their evaluation of computing activity.

Finally, this study was drawn from a small sample within a single organization. Therefore, findings from this study cannot be considered generalizable to all practice settings. For example, it is possible that clients may not have the same response to technology use in different therapeutic contexts, such as intensive outpatient care or inpatient settings. Because of the limited scope of this work, these findings should not be considered as a definitive reflection of the role of technology and psychotherapy. Nevertheless, these findings offer a starting point for understanding an extremely understudied area of clinical practice and may be useful in informing future work in this area.

Conclusion

As EHR rates increase, behavioral health providers will be continually compelled to determine optimal strategies for incorporating these electronic systems into treatment. Findings from this study provide preliminary support for the utility of the CD model; however, future work is needed to examine the effect of this practice on a more diverse set of practice outcomes as well as across varying practice settings and client populations. Generation of such knowledge is critical, as the process of adapting clinical practice around these systems is well underway. As evidenced by the medical literature, some approaches to computer use may detract from traditional markers of effective rapport building, such as eye contact and client-oriented body positioning. To avoid negative outcomes brought on by these changes, establishing empirically tested best practices that may guide practitioners around the effective use of technology in treatment is critical.

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