Chronic Mental Health: Improving Outcomes through Ambulatory Care Coordination

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Abstract

Purpose: This project demonstrated how health information exchange between rural and urban providers improves ambulatory patient care coordination and safety across treatment settings.

Scope: Without electronic communication, behavioral health providers were unable to follow treatment path of patients between settings in urban or rural communities. Waiting for services or medication adjustments increases the problems for people with chronic mental illness. Health information technology was proposed to improve transitions in care through improved care coordination in Southeast Nebraska.

Methods: The HIE created timely access to patient information among the provider care team. Little was known about how health information exchange among behavioral health providers improves care coordination, particularly for patients transitioning between inpatient and outpatient settings. This project contributed to knowledge of this through three studies:

1. Provider barriers to technology acceptance in the behavioral health setting.

2. Behavioral healthcare technology acceptance and adoption.

3. Impact of health information exchange on clinical outcomes.

Results: The HIE Network was implemented and has now grown to include the Omaha area with 30 organizations now participating. 77% of consumers have "opted-in" to share information. Behavioral health providers have positive attitudes toward electronically sharing information, but have concerns about privacy and cost. eBHIN users are generally positive about using eBHIN. Organizations have divergent approaches relating to the implemention of eBHIN.

Key Words: health information exchange; electronic health records; EHR; behavioral health

Final Report

Purpose

The purpose of this project was to address the need for improved care coordination between all behavioral health providers for their patients in southeastern Nebraska. It has been demonstrated that care coordination contributes significantly to improved behavioral health outcomes for patients with chronic mental illness. This effort's intent was to demonstrate how health information technology that is appropriately developed and implemented can improve ambulatory patient care coordination and safety across treatment settings.

Without electronic communication, behavioral health providers cannot follow the full treatment path of patients from various providers in the urban or rural outpatient setting to mental health hospitals, protective custody, or crisis mental health holds. Persons with mental illness face challenges when crucial information is not available as they transition between primary care providers, mental health providers, and, in the cases of inpatient care, their inpatient providers. These gaps in information may exacerbate already tenuous states when service or provider availability, complications in life, and medication changes and interactions occur. When not addressed in a timely and appropriate manner, people with chronic mental illness can decompensate (a deteriorating state) into severe psychosis and regression in all areas of functioning. By decreasing the time it takes for providers to access more comprehensive and accurate information, an HIE promotes safety and enhanced quality of treatment for patients with chronic mental illness.

The study focused on three project/performance sites—major provider facilities in southeast Nebraska: The Lincoln/Lancaster Mental Health Crisis Center, BryanLGH Medical Center psychiatric and behavioral health services, and Blue Valley Behavioral Health system.

Scope

In 2007, of the 413,557 residents in southeast Nebraska, 163,266 residents (40 percent) lived in 15 rural counties. The remaining 60 percent of residents lived in Lancaster County (primarily Lincoln, Nebraska). In this population segment, almost 116,000 individuals (28 percent) living in the region had mental health or substance abuse disorders.

Despite some increased capacity (state funding for de-institutionalization) in serving persons with mental illness in community-based setting, serious challenges still existed:

- Only eight of the 15 rural counties had some form of psychiatric coverage (either a psychiatrist or a nurse practitioner).

- Three of the eight rural counties that had psychiatric coverage either had a two-to-three month wait for appointments or had a waiting list with over 25 people.

- There were no child psychologists in the 15-rural county areas.

- Six of the 15 rural counties had only part-time mental health practitioners (HRSA Bureau of Health Professions, (n.d.).

This lack of service availability meant that persons with mental illness often had to travel to urban areas to seek more specialized or intense treatment. However, information from their existing community-based providers and physicians often were not readily available as they made these transitions to and from their community providers.

Methods

Project Implementation

eBHIN planned to connect all of the Network providers and the state's Administrative Services Organization (ASO). Functionalities would include an internal and external computerized communication system to promote consistencies in data entry for the patient Continuity of Care Record, demographic information, and waiting lists. The scope of work included standardizing core shared data elements, designing an integrated management information system for the sharing of health care data and information among rural and urban care providers, connecting rural and urban providers and developing messaging capabilities between primary care and behavioral health care providers. eBHIN would develop policies and procedures, standardized data elements, intake forms, and other key clinical and demographic information.

Study 1: Interviews: Provider barriers to technology acceptance in the behavioral health setting

Participants were recruited from a list of all behavioral health providers practicing in a 16-county urban and rural region of Nebraska. The recruited sample (n = 32) was: middle-aged, with 65% between 41 and 60 years of age; highly educated, with almost half (47%) having doctorates (i.e., M.D., Ph.D., or Psy.D.) and another 20% having masters degrees; slightly male (53%); and practicing in both public as well as private settings.

A semi-structured interview protocol was designed to probe providers' beliefs about the barriers and benefits of EHRs and how such sharing would affect clients, providers within their organization, and providers outside their organization. The four focal interview questions were: (a) What would be the benefits of a system that allows providers to electronically exchange client behavioral health information with other health care providers, (b) What would be the barriers to using a system that allows providers to electronically exchange client behavioral health information with other health care providers, (c) Who in your organization would you rely on to be part of the decision-making process regarding adopting and implementing an electronic system for behavioral health information, and (d) What is the likelihood that you and others in

your primary practice or organization would use an electronic sharing system if it were developed?

Study 2: Survey: Provider barriers to technology acceptance in the behavioral health setting Survey instrument

All behavioral health providers ($N = 2010$) in Nebraska were invited to participate, either through a website or mailed hard copy. The Dillman method of multiple contacts was used to maximize response. Usable data from 667 respondents were collected. The final sample was mostly female (70%), in midlife (71% between 29 and 59 years of age), highly educated (95% having attained at least a master's degree), and licensed as a mental health practitioner (69%) at an outpatient facility (69%). Most providers (70%) were located in areas with populations exceeding 250 000. The most popular means of sharing client information were non-electronic: fax (91%), phone (84%), and mail (82%). Over one-third of respondents (241 of the 630 who answered the question) reported using electronic sharing (i.e., email and/or EHRs). Providers saw clients an average of 26.85 h per week (SD 15.47).

Likert-scaled statements were developed from previous research that elicited beliefs about the benefits and barriers of HIE from 32 behavioral health providers. The final survey included 38 belief statements, roughly split between those that were positively ($n = 18$) and negatively ($n = 20$) worded. The belief statements were preceded by the prompt to 'Imagine a system that enables you to electronically share client information with medical and behavioral health providers at other organizations, who have the appropriate release of information' (i.e., HIE). In addition to the belief statements, the survey contained: eight items from a computer self-efficacy beliefs scale; two items assessing past experience and satisfaction with EHRs; one question asking current means of sharing client records with other providers; and a summative statement regarding attitude toward HIE (ie, degree of favor or disfavor toward HIE).

Study 3: Survey: Behavioral healthcare technology acceptance and adoption

All eBHIN users ($N = 152$) were invited to participate, either through a website or mailed hard copy. All users were invited, through an emailed message and up to three reminders, to participate in the survey. Users that had not responded to the email invitation were later provided with paper copies of the survey, delivered to their organizations. The survey invitations were staggered based on the implementation of waitlist and referral technologies at the organizations. Usable surveys were received from 62. The final sample was mostly female (83%), in midlife (mean age of 44), white (97%), not Hispanic/Latino (96%), employed by one organization that uses eBHIN (85%), and working fulltime (mean hours per week of 38). Most respondents work directly with clients in a clinical capacity (60%). Of respondents with behavioral or medical licensure, most are licensed behavioral health counselors or clinicians (95%).

The HIE User Survey consisted of 86 items on eBHIN use and user demographics. The questions were clustered by the following topics: software products featured in the HIE, the HIE organization, the user's organization which recently implemented the HIE, and work life. When possible, validated scales from the literature were used.

Study 4: Interviews: Behavioral healthcare technology acceptance and adoption

Interview candidates were selected from among eBHIN users who agreed to complete a survey and have their usage patterns tracked. Selection was based on obtaining input from a variety of users, on such characteristics as: organizational affiliation, professional role, usage patterns. Potential subjects were invited by phone to be interviewed either in-person or by phone. Twelve users were interviewed, representing eight organizations. Half were clinical users and half were administrative/other non-clinical users.

Semi-structured interviews were conducted that focused on seven questions about experience using eBHIN: (a) What is it like to use eBHIN on a daily basis? (b) Do you log in to eBHIN to see client info that has been entered by other providers or agencies? (c) Of the tasks you need to accomplish, which have been impacted by eBHIN? (d) Do you ever have other staff members obtain information from eBHIN for you? (e) Will eBHIN affect measureable client outcomes? (f) Will eBHIN affect measureable outcomes for your organization, and (g) In an ideal world, would you make any changes to Ebhin?

Study 5: Usage: Behavioral healthcare technology acceptance and adoption

De-identified data about provider usage (i.e., time/date stamped log ins and log outs) were provided to the researchers by eBHIN. All user data was included in the data files. eBHIN also provided identified provider usage for those individuals who completed a survey (and consented to have usage data identified).

Researchers will characterize overall patterns of use for all users. For identified users, researchers will compare usage to various survey constructs.

Results

Project Implementation

The HIE Network has been implemented in the 16-county region of southeast Nebraska comprising the Region V Behavioral Health Authority. Additionally, eBHIN has been implemented throughout Region VI comprising 5 counties. These two regions are home to approximately 60% of Nebraska's total population. Thirty organizations currently participate in eBHIN. Little was known about consumer acceptance of the sharing of sensitive information in an HIE environment. An "Opt-in" participation rate of 50% was originally projected based on largely anecdotal evidence. Now that actual participation can be documented, we can report that 77% of consumers have "opted-in" to share information.

eBHIN now offers an array of applications for possible implementation among the Behavioral health safety-net provider group, including:

- Health Information Exchange capabilities for patient look-up; longitudinal records; registration and discharge; record sharing across sites. aggregate reporting for individual sites and across regions; closed loop referrals; medication reconciliation; wait lists and capacity management.

- Electronic file upload of patient encounter data to the State Division of behavioral Health's Administrative Services organization (ASO).

- Electronic Practice Management applications for scheduling, registration and billing at the practice level, fully integrated with the HIE central data repository.

- Electronic Medical Record capability with full behavioral health patient clinical documentation, which, with patient consent, is fully integrated with HIE for robust patient information sharing.

- Direct Secure Messaging capabilities are currently in pilot testing phase for point to point record sharing with out of Network providers.

In addition to these applications, eBHIN developed an organizational system that includes Policies and Procedures specific to operations in a 42 CFR Part 2 constrained environment.

Study 1: Interviews: Provider barriers to technology acceptance in the behavioral health setting

Interviews about the benefits and barriers of EHRs revealed three major themes: (a) quality of care, (b) privacy and security, and (c) delivery of services.

Among the benefits discussed, all providers mentioned quality of care benefits, two-thirds discussed delivery of services benefits, and fewer than one in ten discussed privacy and security benefits. Of the barriers, privacy and security concerns were mentioned by all providers, nearly all providers mentioned delivery of services barriers, and over half the providers cited quality of care barriers.

During the interviews, providers were also asked to rate their overall supportiveness toward EHRs. Most stated they had a positive attitude toward EHRs. Of providers who summarized their overall opinion, 81% characterized themselves as positive, 12% characterized themselves as having an overall negative opinion, and 8% characterized themselves as both positive and negative. When asked whether they believed that behavioral health information was different from medical information, most providers (59%) said yes. Of those providers, most (79%) stated that behavioral health information is more sensitive and the client more vulnerable. Some providers (32%) noted that the subjectivity of behavioral health information makes electronic sharing a more complicated process.

Study 2: Survey: Provider barriers to technology acceptance in the behavioral health setting

The factor analysis resulted in provider beliefs that HIE would: (1) Improve care and communication, (2) Add cost and time burdens, (3) Present access and vulnerability concerns, and (4) Impact workflow and control (positively and negatively).

To assess the contribution of beliefs about benefits and barriers to attitude toward HIE, a series of nested and non-nested multiple linear regressions were conducted. The results suggest that accounting for providers' benefits and barriers beliefs results in the best model for predicting attitude, and that barriers may be particularly important.

The analysis resulted in a two cluster model. The largest cluster (67%) comprised respondents with positive beliefs about HIE. The most important belief factor for this cluster was: strong agreement that HIE would Improve care and communication, skepticism that HIE would Add cost and time burdens, belief that HIE would positively Impact workflow and control, and moderate concerns that HIE would Present access and vulnerability concerns. The smaller cluster (33%) had negative beliefs about HIE. For this group the most important belief was that HIE would Add cost and time burdens, followed by strong beliefs that HIE would Present access and vulnerability concerns, concern that HIE would negatively Impact workflow and control, and some skepticism that EHRs would Improve care and communication.

The two clusters diverged significantly on age (Positives were younger (mean 50.36 years old) than Negatives (mean 54.85 years old); confidence in computer skills (Positives were more confident (mean 28.58) than Negatives (mean 22.46); and previous satisfaction with EHRs (Positives had better past experiences (mean 3.72) than Negatives (mean 2.50).

Study 3: Survey: Behavioral healthcare technology acceptance and adoption

For most constructs, respondents were moderately positive toward eBHIN (i.e., with responses falling between 2.0 – 3.0 on a 5 point scale with 1 being most positive to 5 being most negative). Only one construct exceeded 3.0 (*Performance Expectancy* was 3.03). Respondents were most positive that they would use eBHIN (*Behavioral Intention* = 1.70) and that they had the support they needed to use eBHIN (*Facilitating Conditions* = 1.93).

When analyzing the patterns of responses across users, a cluster analysis returned two clusters of respondents: a larger cluster (69%) more strongly positive and a smaller cluster (31%) less strongly positive about eBHIN. On average, the more strongly positive cluster and less strongly positive cluster had similar overall patterns of response. There was no significant difference in cluster assignment related to whether work with clients in clinical capacity.

Further analyses are underway.

Study 4: Interviews: Behavioral healthcare technology acceptance and adoption

Data are still being analyzed.

Study 5: Usage: Behavioral healthcare technology acceptance and adoption

Data are still being analyzed.

List of Publications and Products

Shank N. Behavioral health providers' beliefs about health information exchange: A statewide survey. *J Am Med Inform Assoc* 2012 July;19(4):562-569.

Shank N, Willborn E, PytlikZillig L, Noel H. Electronic health records: Eliciting behavioral health providers' beliefs. *Community Ment Health J* 2012 April;48(2):249-254.