

Information Systems/Information Technology for Competitive Advantage: The Case in Behavioral Healthcare Service

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ABSTRACT

In this study, 42 articles were reviewed and summarized with respect to identified benefits and challenges of the development and implementation of Electronic Medical Records, Tele-health, and electronic appointment reminders. Results of this study showed that 100% of the articles included in this review indicated improved clinical quality of care, 60% indicated improved financial performance, and 91% indicated enhanced administrative functioning of entities that utilized EMR, Tele-health, and electronic appointment reminders. These findings support the idea that the utilization of EMR, Tele-health and electronic appointment reminders can lead to the ability of Community Based Behavioral Healthcare Treatment Centers (including those operating in Mississippi) to offer higher quality, clinically proven effective services at lower costs than those of their competitors. This ability will enable these service providers to establish a competitive advantage in the behavioral healthcare market place -- even in today's tumultuous economic environment.

INTRODUCTION

The utilization of Information Systems/Information Technology (IS/IT) activities that are directly tied to service provision in Community Based Behavioral Healthcare Treatment settings including Electronic Health/Medical Records, Tele-health activities, and appointment reminder programs, is somewhat rare in the state of Mississippi. While medical facilities and state-run psychiatric hospitals utilize some version of Electronic Medical Records, Community Based Behavioral Healthcare Treatment Centers often do not – partially because of cost factors, and partially because of the fear of and reluctance to move away from paper records.

Many Community Based Behavioral Healthcare Treatment Centers think that they cannot afford the investment in hardware, software, development costs, training costs, etc. Indeed, these costs can be substantial. However, it is this author's opinion that the utilization of IS/IT can offer

a substantial competitive advantage to community based Behavioral Healthcare Providers through the implementation of such tools as Electronic Health/Medical Records, Behavioral Tele-health services, and electronically driven appointment reminders. Each of these IS/IT tools can lead to enhanced clinical, financial, and administrative functions for Community Based Behavioral Healthcare Treatment Centers. With high performance levels in all three of these areas, Community Based Behavioral Healthcare Treatment Centers can be assured of a more secure position as behavioral healthcare providers of choice even in today's ultra competitive and unstable market.

In this paper, we will conduct a review of the available literature regarding the benefits and challenges associated with the utilization of Electronic Health/Medical Records, Tele-health services, and electronically driven appointment reminder programs as they relate to clinical, financial, and administrative functions. For purposes of this study, and based on this author's research, the terms Electronic Health Record and Electronic Medical Record are used interchangeably. In addition, it is acutely aware that the community based Behavioral Healthcare Service sector involves caveats that are particular to only that service sector, an assumption has been made in the review of available literature that a logical extension can be made from information reviewed about the use of IS/IT in primary care settings to that of Community Based Behavioral Healthcare Treatment Centers. Thus, the literature reviewed in this study will reflect findings associated with both primary care and behavioral healthcare/mental health settings. A summary of the findings of these studies is offered in this paper in an effort to better understand the impact that these IS/IT tools can have on Community Based Behavioral Healthcare Treatment Centers. This author believes that the review of the literature will indicate that the use of IS/IT in these settings can lead to overall improved clinical, financial, and administrative outcomes in Community Based Behavioral Healthcare Treatment Centers, thereby establishing a substantial competitive advantage for those Centers that fully utilize IS/IT capabilities.

BACKGROUND INFORMATION AND CURRENT STATUS ANALYSIS

It has been established that sources of competitive advantage include such things as providing the best service or product on the market, achieving lower costs than competitors, and giving customers the most value for their money spent (Jessup & Valacich, 2008). While businesses in different markets may disagree on how to achieve these benchmarks, even the President of the United States has endorsed the finding that technology should be utilized to de-fragment mental health services provided in this country, provide consumers the highest quality care possible, and decrease overall treatment costs, thereby transforming mental health systems of care (Hogan, 2003).

Manderscheid (2004) has stated that mental health services in this country have been poor. He calls for coordinated care across systems, more up to date financial practices, documented outcomes as part of clinical practices, and an increase in provider accountability in order to increase the quality of health/mental health care and decrease costs which continue to increase at alarming rates. All of these tasks can be facilitated through the efficient and effective use of modern IS/IT capabilities.

Shields, et al., (2007) reported that a national survey of federally funded community health centers indicated that 26% of the Centers reported some level of Electronic Health Record capabilities and 13% reported having minimal EHR capabilities. Since these centers serve the most economically disadvantaged population, these statistics support the idea that there is yet another disparity in the quality of healthcare for individuals from lower socioeconomic backgrounds due to those centers' lack of adoption of health information technology. The reason most cited by these centers for not having implemented EHR systems was cost and a lack of funding. Therefore, many barriers continue to exist to the adoption and full utilization of EHR/EMR technology.

The use of Electronic Medical Records in primary care is a topic which has been fairly well investigated. Berner, Detmer, and Simborg (2005) reviewed the history of the use of technology in general, and Electronic Medical Records in particular, beginning in the 1960's. It has been noted that issues such as a lack of readiness in technology, a focus on financial systems, and physician resistance to utilizing available technology have all played a role in the slow adoption of IS/IT in the healthcare field. From the 1980's to the present time, major technological improvements have been made, allowing physicians and other healthcare providers to improve the quality of their services and decrease the number of medication errors that were made.

A September, 2006 poll carried out by the National Council for Community Behavioral Healthcare found that less than 8% of community behavioral healthcare providers across the United States had implemented fully functioning clinical Electronic Health Records. Yet, 32% had implemented billing components of Electronic Health Records. This poll indicated that a lack of funding and the need to meet reporting and documentation demands of multiple payer sources were noted as major barriers to Community Based Behavioral Healthcare Treatment Centers having adopted fully functioning EHR/EMR systems (Rosenberg, 2007). Other studies noted that concerns about security and confidentiality have played a large role in the reluctance of healthcare professionals to embrace IS/IT tools such as Electronic Medical Records, and must be given serious consideration (Bates, 1997; Johnson, Benbow, and Baldwin, 1999; Jerome, DeLeon, and Gedney, 2000; Mandl, Szolorits, and Kohane, 2001; Major, & Turner, 2003; and Hillstead, et al., 2005).

Yet, many researchers have found that in addition to providing a holistic approach to treatment, developing clinical interventions that are state of the art with measurable outcomes, and developing an expert workforce, primary care and mental health systems must adopt and fully utilize such IS/IT tools as Electronic Medical Records (EMR) and Tele-health services in order to provide the highest quality, most cost effective services to individuals in need (Stamm, 1998; Berner, et al., 2005; Chaudhry, et al., 2006; Rosenberg, 2007; Shields, et al, 2007).

In addition, a multitude of studies have found that the use of Electronic Medical Records and Tele-health have enabled providers to increase their quality of care as evidenced by an increase in the effectiveness of Decision Support Systems and Evidence Based Practices (Stamm, 1998; Lange, et al., 2003; Nissen, et al., 2004; Clancy and Cronin, 2005; Chaudry, et al., 2006), an improvement in clinical outcomes and measurement of those clinical outcomes (Owen, et al., 2004; Simonian, 2007; Wisdom, et al., 2008) the provision of more complete,

timely, and legible documentation (Tang, LaRosa, and Gorden, 1999; Kuperman and Gibson, 2003; Hippisley-Cox, et al., 2003; Miller et al., 2005), easier access to medical records leading to such events as fewer medication errors (Bates, et al., 1994; Bates, et al., 1999; Johnson, Benbow and Baldwin, 1999; Kaushal, Shojania, and Bates, 2003; Miller and Sim, 2004; Tsai and Bond, 2008), and higher compliance levels with treatment on behalf of consumers, partly due to such things as electronic appointment reminder systems (Cannon, & Alen, 2000; Sequist, et al., 2005).

Interestingly, the results of another poll conducted by the National Council found that 26% of behavioral health organizations that had functional Electronic Health Records saw improved quality (Rosenberg, 2007). Rosenberg also reported that that participants in the poll

“reported that the EHR offers critical support to the service improvement process; promotes the application of protocols and guidelines; helps to maintain contact with individuals who move through a complex system and who are hospitalized in local or state hospitals, lose stable housing, or become entangled in the criminal justice system; and holds the promise to reduce the enormous financial burden of paperwork and reporting duplication, all efficiencies that improve the quality of services.”

Tele-health and its extension, Behavioral Tele-health services have also been found to hold the promise of improved healthcare/mental healthcare through the provision of such services as medication management, consultation, assessment and diagnosis, psycho-education, case management, crisis response, and triage services (Nickelson, 1998; Jerome, DeLeon, and Gedney, 2000). Jerome, DeLeon, and Gedney (2000) noted that Behavioral Tele-health via real time video conferencing, email, etc. can provide such core services as psychological assessments and psychiatric evaluations especially for correctional facilities and forensic settings as well as other rural, confined, underserved, and isolated populations that would otherwise remain unserved or underserved. DeLeon and Wiggins (1996) found that email and internet connectivity have been assimilated into healthcare/mental healthcare treatment services. These tools offer more affordable IS/IT options provided through secure internet links and low end video conferencing. In addition, the use of EMR can not only improve clinical care, but can also be utilized as a research tool in order to further the clinical effectiveness of the entire behavioral healthcare field.

In addition, Lange, et al., (2003) studied the use of online therapy in a controlled trial on internet driven treatment of Post Traumatic Stress Disorder. Sixty nine participants who received online therapy improved significantly more than 32 participants on a waiting list control condition in both symptoms related to the trauma they had incurred and general levels of psychopathology. Lange, et al., found that more than 50% of the treated participants showed reliable change and clinically significant improvement through the use of online therapy (2003).

Sturges (1998) found that computerized assessments showed reliability and validity measures that were generally better than that of clinician-administered questionnaires. Sturges also notes that tasks involved in mental health service delivery (i.e., treatment planning, data collection, etc.) can be made more cost-effective with the assistance of Information Technology. He noted that in one study, twenty outpatient consumers who completed computer-assisted treatment were compared to twenty consumers in a comparison group with similar demographics

and mental health issues. Complete relief of symptoms was found in approximately 50% of both groups. Significant improvement was found in 75-80% of both groups. Sturges also noted clinical success in the use of computer based treatments for mild to moderate depression, panic disorders, and parenting skills (1998).

Stamm (1998) also found that Tele-health in mental healthcare settings can be an effective tool to reach consumers who need help but cannot access help due to economic status, culture, climate, geography, or even warfare boundaries. In addition to clinical services, Stamm found that Tele-health can be utilized to carry out administrative, research, teaching, and professional development activities.

Hunt, et al., (1998) studied computer based clinical Decision Support Systems and their effect on physician performance and patient outcomes. These types of Decision Support Systems can enhance clinical performance for drug dosing, preventive care, and other aspects of medical care. However, it was also found that there was not enough convincing evidence that the Decision Support Systems overwhelmingly enhanced diagnosing skills. More research is needed in order to study the effects of DSS on diagnosing.

While many of these studies indicated that the use of EMR, Tele-health, and even the use of electronic appointment reminders can improve clinical quality and encourage the use of more efficient, effective, measurable, and accountable outcomes, studies also noted that the implementation of EMR and Tele-health can be costly, not only in terms of dollars spent on hardware, software, connectivity, etc., but also in terms of up front personnel training time and organizational and system redesign (Kuperman and Gibson, 2003; Venkatraman, 2008).

Charles (2000) found that while Telemedicine can improve access to care in rural areas, not all of the costs are covered even when third party insurers are willing to reimburse services including psychiatry. According to Charles, third party payers do not pay for related costs such as those involved in implementation of the technology. Charles suggested that healthcare providers should determine if they would receive a reasonable return on their investment before going forward with steps to implement Telemedicine technology. Charles also predicted, though, that as more and more providers utilize Telemedicine, third party payers will increase their payments for the services in an effort to control costs. Chaudhry (2006) simply found that empirical cost data were limited, as were any solid predictions on cost savings.

Other studies reviewed by this author were more encouraging about the costs and cost savings of implementing EMR systems. For instance, after comparing the use of IT in healthcare with that of other industries, Hillstead, et al. concluded that eventually more than eighty one billion dollars annually could be saved as a result of increasing the efficiency and safety of healthcare through the implementation of IT (2005). When technology is used to improve prevention and chronic disease management capabilities, it has been found that these savings could even double. Another cost-benefit analysis of the usage of EMR by primary care physicians in an ambulatory-care setting was performed by Wang, et al. (2003). Results of this analysis indicated that with the use of EMR, a net benefit of \$86,400 per provider for a five year period could be realized. Cost savings were realized mostly in the areas of drug expenditures, better utilization of test results, and improved billing and collection practices (Wang et al., 2003).

On a grander scale, Middleton, et al., reported that healthcare information exchange between key stakeholders in the healthcare delivery system could potentially foster savings of up to \$78 billion annually in the United States (2005). However, up to the time when this study was conducted, there was no reinforcement or reward for local level providers to engage in clinical healthcare information exchange. Like other researchers, we offered a discussion regarding some encouraging steps that had been taken on the federal level, namely the Health Insurance Portability and Accountability Act (HIPAA). According to these authors, HIPAA facilitates cooperation among service providers while establishing privacy and security protections, and this increased cooperation leads to an improvement in information exchange. Among other things, Middleton, et al., recommend that financial incentives should be put in place in order to increase the use of Electronic Health Records (2005).

In an analysis regarding the effects of Decision Support Systems, EMR, and computerized physician order entry, Shekelle, Morton, and Keeler (2006) screened 855 studies and included a final sample of 256 studies in their research. Findings of this analysis indicated that the availability of an EHR system, which included clinical information management and decision support tools, led to an improvement in provider performance. Findings also noted that cost-benefit analyses completed in this study predicted the following:

“substantial savings from EHR...implementation: The quantifiable benefits are projected to outweigh the investment costs. However, the predicted time needed to break even varied from three to as many as 13 years. Health Information Technology has the potential to enable a dramatic transformation in the delivery of health care, making it safer, more effective, and more efficient.”

Rosenberg (2007) later reported similar findings when she noted that healthcare costs could be expected to be reduced by up to 20% through the use of Electronic Health Records. Quoting James Kretz, Rosenberg noted that approximately one fourth of every healthcare dollar is now spent on record keeping and “administrivia” (Rosenberg, 2007). The use of EHR can significantly decrease this incidental cost figure.

While clinical service provision improvements and financial stability are two essential components of establishing a competitive advantage in the Community Based Behavioral Healthcare Treatment sector, administrative efficiency and effectiveness must also be established. Administrative issues of staff supervision and training, billing and collections, access to records, continuous quality improvement, regulatory and legislative compliance, and compliance with established standards of care, are just some of the critical administrative components that must be mastered.

Professional training and supervision can be provided through the internet, Teleconferencing, Video Conferencing, etc. (Stamm, 1998; Mandl, Szolovits, and Kohane, 2001). By utilizing these tools, the amount of time that personnel must be away from the office in order to obtain required continuing education units can be substantially decreased. This allows for increased face to face contact time with consumers, higher production numbers, and substantially lowered travel/workshop costs.

Multiple studies have found that in comparison to paper records, Electronic Medical Records are more accessible, complete, legible, fully understandable, and accurate (Tang, LaRosa, and Gorden 1999; Johnson, et al., 1999; Hippisley-Cox, et al., 2003; Tsai and Bond, 2008). Indeed, in a study of three community mental health centers in Indiana, Tsai and Bond found that Electronic Medical Records were 40% more complete and 20% faster to access than paper records. With such complete documentation, one can predict fewer financial audit exceptions and costly monetary penalties associated with audit compliance issues.

Another aspect of administrative oversight is regulatory and legislative compliance. Middleton, et al. (2005) noted that national policy can have an impact on adoption of Health Information Technology. In particular the impact that HIPAA and the Medicare Modernization Act of 2004 have had on the adoption of Electronic Health Records have been addressed. While HIPAA serves to facilitate the sharing of health information while insure privacy and protection of confidentiality, the MMA supports the use of electronic prescribing and other aspects of EMR. Both are statutory guidelines that must be met by Behavioral Healthcare Providers. Both can be more easily met with the use of Electronic Medical Records. Haines (2007) showed that providers can build in controls in their database structure to insure corporate compliance and provide valid, reliable, and thorough information that increases accountability and lowers duplication of record keeping activities.

Clancy and Cronin (2005) reviewed such technological tools as electronic appointment reminders, treatment alerts, quality measures, and other administrative applications and found that an information infrastructure which is well designed will facilitate easier quality monitoring activities and quicker performance feedback to personnel so that treatment improvements can be made with little to no time delay. For instance, the availability on EMR systems of accurate information about particular drugs, their costs, and their side effects can help physicians to utilize the most appropriate medication and dosage of those medications, thereby increasing adherence to prescribing protocols and lowering medication errors. This in turn can lower malpractice lawsuits and increase cash flows.

Perhaps one of the most studied healthcare providers that has embraced the use of IS/IT in improving its clinical as well as administrative system of care has been the Veteran's Health Administration. Owen, et al. (2004) studied a method of utilizing data that was electronically acquired from the Veteran's Health Administration's VISTA computer database in order to test adherence to and performance of established guidelines for the treatment of schizophrenia within the VHA system. Specific areas that were studied included dosing practices and side effect monitoring of antipsychotic medications. Since the VHA's Electronic Medical Record system is an integrated system that includes such things as records of patient service usage, diagnostic codes, medication records, results of lab tests and progress notes, the researchers were able to not only test for adherence to dosing guidelines, but also compare the use of EMR documentation of such issues with that of traditional paper records.

Owen, et al., found that the use of data obtained directly from the EMR system provided the opportunity to more efficiently perform quality improvement activities. Since 100% of the data can be fairly easily obtained from the EMR system, the reliability of the results of the quality improvement tests is higher than results from a much smaller sample taken from paper

medical records. Unfortunately, however, this study also found that both EMR and paper records were incomplete (Owen, et al., 2004). Hence, even though IS/IT can greatly assist behavioral healthcare providers in improving the quality of their services, it is limited in the scope of its ability to help when professionals do not enter the correct or complete data in the first place.

As a testament to the effectiveness of the VHA's EMR system, Venkatraman, et al., (2008) noted that the VHA system was once a system which was wrought with problems regarding patient care and inefficiency to the point of being considered dangerous. Yet, Venkatraman, et al., (2008) noted that the VHA's EMR system is now considered one of the premier systems in the nation as it offers independent yet integrated VistA systems and VistAWeb at VHA medical centers across the United States that maintain not only clinical, but also financial and administrative data that is usable by each specific location.

Finally, while many studies have cited substantial administrative benefits of the use of EMR, Tele-health, and other IT tools, Kilo (2005), Haines (2007), and Terry, et al. (2008) caution that providers must make certain to build an adequate technological infrastructure and plan for and provide adequate training time, resources, and staff support if they wish to effectively implement and fully utilize Electronic Medical Records in the Community Based Behavioral Healthcare service sector.

RESEARCH METHODOLOGY

Sixty five articles concerning the benefits and challenges of the use of IS/IT in the healthcare/behavioral healthcare sector were screened. Of these 65 articles, 42 were included in this study. Articles were not included in this study if the study discussed only Personal Health Records, or if the article did not specifically address clinical, financial, or administrative functions related to Electronic Medical Records, Tele-health, or electronic appointment reminders.

Articles were reviewed for their inclusion of information regarding the effects of the utilization of EMR, Tele-health, and electronic appointment reminders on clinical, financial, and administrative functions within the healthcare/behavioral healthcare service sector. Benefits and challenges of the utilization of EMR, Tele-health, and electronic appointment reminders were summarized and are presented in table format. Percentages of articles surveyed that found improved clinical quality, financial performance, and administrative functioning were determined and have been summarized in table format as well.

RESULTS SUMMARY

Results of this review of the literature include the following: Of the 42 articles included in the study, 57% (n = 24) discussed clinical benefits and challenges, 36% (n = 15) discussed financial benefits and challenges, and 79% (n = 33) discussed administrative benefits and challenges.

One hundred percent of the articles that discussed issues of clinical quality indicated that the use of IT/EMR/Tele-health leads to improved clinical quality. Sixty percent of the articles

discussing financial issues found eventual cost savings, or at least that the benefits of EMR/IT use far outweighed the costs. Ninety one percent of the articles discussing administrative issues found significant improvements in administrative aspects of healthcare/behavioral healthcare services when EMR was utilized. Eight percent of these noted that security, safety, and confidentiality issues are areas of major concern. See Table 1 for a summary of articles surveyed along with positive, negative, or neutral findings regarding the effects of EMR, Tele-health, and electronic appointment reminders on clinical, financial, and administrative components of healthcare/behavioral healthcare systems.

Results of this literature review indicated specific benefits of the use of EMR, Tele-health, and electronic appointment reminders including such things as fewer medication errors, long term cost savings, and increased efficiency and accuracy in continuous quality improvement measures. Specific challenges noted included such things as substantial development and implementation costs, higher risks associated with consumer privacy and confidentiality, and a lack of readily available reimbursement sources for electronic data information sharing and many Tele-health activities. An extensive list of clinical, financial, and administrative benefits and challenges determined through results of this review can be found in Table 2.

MANAGEMENT IMPLICATIONS

Clearly, as 100% of the articles surveyed indicated improved clinical quality of care, 60% indicated significant financial gains, and 91% indicated significant enhancement of administrative systems that occur with the utilization of EMR, Tele-health, and electronic appointment reminders, Community Based Behavioral Healthcare Centers would be prudent in developing and implementing these IS/IT tools.

This review has shown that the use of EMR and Tele-health can lead to such things as fewer medication errors, an increase in the reliability and validity of clinical assessments, an increase in treatment compliance, and an increased utilization of Evidence Based Practices and measurability of outcomes, all of which contribute to an overall improvement in clinical treatment outcomes.

While costs associated with these tools can be substantial, this study has found that the benefits far outweigh the costs, and that the costs can be recouped through such things as decreased personnel training costs, decreased travel, and increased availability of client care time.

This review has also shown, however, that benefits of utilizing EMR, Tele-health, and electronic appointment reminders will not occur without much careful planning and attention being paid to such administrative issues as personnel resistance and fear; availability of training, support, and other resources for personnel; security and confidentiality; and infrastructure development which will enhance clinical workflow, billing and collection activities, and quality assurance measures. An effective strategy in addressing these issues would be to genuinely include direct service personnel in the development and implementation of the system. Using this tactic would not only increase buy-in and utilization, but would also help to insure that the finished product is one which facilitates, not hampers the entire workflow system.

CONCLUDING REMARKS

The purpose of this study was to complete a review of the literature and determine if the utilization of IS/IT (i.e., Electronic Medical Records, Tele-health, and electronic appointment reminders), in the Community Based Behavioral Healthcare Treatment sector, would lead to improved clinical, financial, and administrative outcomes. This author further sought to determine whether or not improvements in these areas would then assist these providers in establishing a competitive advantage over other providers that do not fully utilize EMR, Tele-health, or electronic appointment reminders.

A review of 42 articles led to the identification of specific benefits and challenges associated with the development and implementation of EMR, Tele-health, and electronic appointment reminders. 100% of studies reviewed indicated that the utilization of EMR, Tele-health, and electronic appointment reminders lead to improved clinical quality of care. Sixty percent indicated that the use of these tools lead to improved financial performance. Ninety one percent of the studies reviewed indicated that the use of these IT tools leads to improved administrative functioning. Eight percent of the studies indicated that security, privacy, and confidentiality remain substantial concerns of both consumers and professionals. Hence, this is an area that should be studied further. Also, while results of this study clearly indicate that the utilization of EMR, Tele-health, and electronic appointment reminders can lead to improved clinical quality of care, financial performance, and administrative functioning in Community Based Behavioral Healthcare Treatment Centers, they also note that challenges to implementation and utilization remain, such as resistance and fear on the part of direct care personnel. Future research on overcoming identified barriers is warranted.

Finally, with improvements in clinical, financial, and administrative functions, the ability of Community Based Behavioral Healthcare Treatment Centers (including those operating in Mississippi) to offer higher quality, clinically proven effective services at lower costs than those of their competitors will surely enable those providers to establish a competitive advantage in the behavioral healthcare market place -- even in today's tumultuous economic environment.

(Tables and references are available from the first author upon request)