

Evidence-Based Practice for Managing the Mentally-Ill Inmate Population
(Technical Paper)

Evaluation of Emerging Technologies in Augmenting Treatment for Serious Mental Illness
(STS Research Paper)

A Thesis Prospectus Submitted to the

Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements of the Degree
Bachelor of Science, School of Engineering

Emma Hand
Fall 2019

Technical Project Team Members

Henry Bramham
Claire Deaver
Sean Domnick
Emily Ledwith
Noah O'Neill
Callie Weiler

On my honor as a University Student, I have neither given nor received
unauthorized aid on this assignment as defined by the Honor Guidelines
for Thesis-Related Assignments

Signature Emma Hand Date 11/21/2019

Approved Michael C. Smith Date 11/21/2019
Michael C. Smith, Department of Engineering Systems and Environment

Approved by Prof. Kent Wayland, Department of Engineering and Society

General Research Problem: Improving Successful Linkage to Mental Health Treatment

How can successful linkage to mental health treatment be improved?

The issue of mental health in the United States is certainly not a recent issue, but talk surrounding innovations in mental health treatment and services has recently gained traction. Despite the ubiquity and prevalence of mental illness in the United States, the ability to link an individual to effective mental health services and prevent disengagement from treatment is deficient. Of those individuals diagnosed with mental illness in the United States, less than half received treatment in the past year (Bose et al., 2017, p.3). Furthermore, data from the National Comorbidity Survey Replication (Olfson et al., 2009, p.1) indicates that nearly a quarter of the individuals who receive treatment for mental illness drop out before completing the recommended course of treatment. If individuals with mental illness fail to receive adequate treatment, they run the risk of becoming marginalized from society and suffering from worsening mental health problems, ultimately increasing their potential to engage in self-harm or harm to others.

The lack of engagement in mental health treatment services can be attributed to a combination of factors. Despite progress in recent years, the stigma surrounding mental illnesses and the people who suffer from them still acts as a barrier, precluding individuals from seeking needed treatment. Many people are fearful of being stigmatized if they admit to needing outside help. Additionally, many individuals fail to receive treatment due to the lack of perceived need for treatment, availability of nearby mental health treatment facilities, or access to insurance or other forms of adequate payment. While the aforementioned reasons for refusing treatment apply to the general population of individuals with mental illness, the treatment linkage process takes on an additional layer of complexity when considering the mentally-ill inmate population. Once an inmate is booked into the jail, the responsibility for successfully connecting them with mental health services and treatment falls partially on government agencies. Some ongoing research has been conducted to understand what factors affect linkage and how successful linkage affects recidivism rates, but most findings, including the research done by the University of Virginia Capstone team, are still preliminary.

More recently, there has been a push for a wider variety of treatment options to help satisfy the needs of patients with a wide range of conditions. More specifically, there has been a growing effort to invest in treatment options other than inpatient therapy in an attempt to address gaps in mental health services and improve patient outcomes. Emerging mobile health technologies, such as web or mobile-based applications, offer a unique way to assess and treat mental illness. As the availability and range of treatment options expands, the hope is that more individuals will be willing to seek out treatment, as well as to continue receiving treatment for longer periods of time.

Evidence-Based Practice for Managing the Mentally-Ill Inmate Population

How can evidence-based decision making be used to better characterize the nature of the mentally-ill population in the Charlottesville criminal justice system?

While the rate of incarceration in the U.S. remained relatively stable up until the mid-1970s, since then incarceration rates have nearly quadrupled. As of 2012, roughly a quarter of the world's prisoners were held in U.S. jails, even though the U.S. only makes up about 5% of the world population (National Research Council, 2014, p.2). The rapidly growing inmate population in the United States is an issue of its own, but this has only escalated the issue of mental illness among inmates. These inmates have a longer average length of stay, are more expensive to treat at the jail, and have significantly higher recidivism rates compared to inmates who are not found to have a mental illness.

Within Charlottesville specifically, of the inmates screened at the Albemarle-Charlottesville Regional Jail (ACRJ), 32% met the minimum screening criteria for serious mental illness using the Brief Jail Mental Health Screener (BJMHS), a nationally-recognized and well-validated screening tool. However, rehabilitation programs designed to help inmates with mental illness are not built out to help such a large population. This has opened up the discussion about whether or not current practices are suitable to serve inmates with mental illness, as well as what can be done to better understand and serve this cohort.

This Capstone project advances ongoing research to identify important issues and best practices for managing the mentally-ill inmate population based on data from multiple local criminal justice agencies. These agencies include ACRJ, Region Ten Community Services Board, Offender Aid and Restoration (OAR), the Thomas Jefferson Area Coalition for the Homeless (TJAC), and the Virginia Department of Corrections (DOC). Given the complexity of the local criminal justice and mental health systems, additional analysis is needed to uncover patterns in the mentally-ill inmate population, as well as to verify previous years' work. Through our analysis, the team seeks to understand the demographics of inmates who screened-in for mental illness, examine recidivism rates and associated charges, as well as further investigate factors that impact successful linkage to mental health treatment. A major focus of this year's work is effectively integrating data from various agencies to get a more holistic view of the mentally-ill population. This merging of data allows us to fully understand the path an inmate takes from arrest to successful treatment linkage.

Little research has been done in the Charlottesville region regarding the mentally-ill inmate population and available treatment, and thus our team relies on the work of previous Capstone groups to lay the foundation for current practices and effective treatment. Having access to a new year of data enables our team to verify the work from prior years, ensuring that the analysis conducted is accurate and up to date. Findings from previous years' work has led to the development of new policy and program initiatives, such as the 2018 Therapeutic Docket, a sentencing alternative to traditional probation for offenders with serious mental illness. Our work

will help advance conversation about mental illness in the Charlottesville criminal justice system that will ultimately allow local agencies to make more informed decisions regarding resource allocation and improve the well-being of the criminally-involved mentally-ill.

Evaluation of Emerging Technologies in Augmenting Treatment for Serious Mental Illness

How have emerging technologies in the field of mental health been used to aid in the treatment of serious mental illness?

Introduction

Recent advancements in both technology and healthcare have opened up a new frontier in digital mental health treatment and support. Within the past few years, thousands of mobile applications and online platforms have been introduced to help individuals who suffer from mental illness perform a variety of tasks at their own convenience, such as assessing symptoms, locating available resources, and tracking the treatment process (Luxton et al., 2011, p.1). The majority of these technologies have been specifically targeted at individuals suffering from depression, stress, and anxiety, rather than those suffering from serious mental illness (SMI).

SMI is defined as a mental, behavioral, or emotional disorder resulting in serious functional impairment, and includes schizophrenia-spectrum disorders, severe bipolar disorder, and severe major depression (National Institute of Mental Health, 2017, n.p.). Individuals with SMI are disproportionately affected by comorbid medical conditions and socioeconomic concerns, including homelessness, unemployment, and poverty. This ultimately affects their ability to engage in illness self-management and proactively seek out treatment options (Fagiolini et al., 2009, p.1). Without adequate treatment, individuals with SMI often suffer from reduced quality of life, increased relapse rates, and premature mortality. These issues become further exacerbated as individuals with SMI are more likely to face barriers to receiving mental health services, including the inability to afford care and limited access to transportation (Dickerson et al., 2003, p.7). The combination of these issues has justified the need for more innovative approaches to illness self-management, symptom tracking, and overall treatment of SMI.

Background

Standard telemedicine has been used in the past as an alternative to in-person mental health treatment, providing users with the option of receiving remote support services from a mental health professional. However, this form of treatment is limited by the need for health providers on the other end of the phone, as well as the high price often charged. This has prompted the rapid development of mobile health solutions, and recently these technologies have

expanded to reach individuals with SMI. These technologies offer a wider range of services spanning more than just one-on-one consulting sessions, with the hope that individuals with a wider range and severity of mental illnesses can benefit.

Issues involving the effective treatment of mental illness have previously involved two parties: the mental health professional and the individual seeking treatment. The rise of mobile health platforms to aid in mental health treatment has introduced a middle man: the companies developing these digital platforms. Allowing the patient to be a step removed from the health professional may be comforting for some individuals but inadvertently allows treatment strategies and advice to be passed along to patients without direct approval from a mental health specialist. Considering how often digital mental health treatment options are introduced, it would be helpful to further investigate how many of these online platforms require approval from a mental health specialist.

Literature and studies on the topic of integrating digital technologies in behavioral healthcare exist, and due to the rapid expansion of technology, it is inevitable that new technology-based therapeutic tools will continue to be introduced. Publications such as the Treatment Improvement Protocol written by the Substance Abuse and Mental Health Services Administration detail the various levels of behavioral health technologies that exist currently. Individual studies have also been done to evaluate the feasibility of using mental health applications to augment integrated behavioral health services (Hoffman et al., 2019, p.2). However, far more studies have been conducted that evaluate platforms to help treat more common mental illnesses, such as depression and anxiety. My research will build upon these studies to dig into the range of technologies used to treat SMI and understand their effectiveness.

Data Collection/Methods

In order to further understand and evaluate existing technologies addressing SMI, this thesis will further review results from published studies evaluating a technology-based mental health platform. These studies should include participants diagnosed with SMI and should encompass a range of digital interventions, including, but not limited to, symptom monitoring, promoting health and wellness, medication reminders, and online support groups. The studies should be recent, considering the rapid development and growing prevalence of digital platforms. The results of the studies would be compiled to get a better sense of the range of technologies that exist, as well as to understand what has worked and what has not worked in the past.

A formal example of such a study was done in 2014, in which sixty mothers diagnosed with SMI were enrolled in an online parental education course. Results from the study indicated that not only was the group interested in and capable of receiving online treatment and support, but this type of online intervention improved coping skills and decreased overall stress levels (Kaplan, et al, 2014, p.1). Collecting and comparing findings from additional, more recent studies will allow me to better analyze the current landscape of treatment options for patients with SMI.

This thesis will also analyze these studies and additional literature to understand the incremental benefit compared to traditional methods of treatment. Formal cost analysis can be done to determine the potential savings (if any) these platforms offer over standard treatment methods. This would be accomplished by analyzing the cost of digital mental health treatment options compared to standard SMI treatment. Through the examination of recent studies and literature, it is crucial to acknowledge limitations and drawbacks of these technologies. While there has been a recent shift towards increased affordability and availability of mobile devices, cost and access to these technologies remains a barrier for some people and should be taken into consideration.

Additional research will be conducted with the help of one of our clients, a woman who works for Region Ten, which is a community service board that works to provide mental health, intellectual disability and substance use services. Individual meetings with the client will be set up to determine what treatment options exist for patients with SMI, with a specific focus on understanding technology-based options. Since the capstone team has access to the client's data, we can utilize that data to see what combination of treatment options have been successful in ultimately improving a patient's overall health.

Conclusion

With the rapid expansion of technology, especially in the healthcare industry, there is much greater potential to improve the ability to treat people with mental illness. Through my STS research, I hope to highlight the available technologies and their potential to benefit individuals diagnosed with serious mental illness. My STS deliverable will be an improved understanding of the range of existing technologies, highlighting the technologies that have proven successful, as well as their limitations. This research, in combination with the analysis done by the entire capstone team, will ultimately provide decision makers and *government officials* with up-to-date and accurate information that can be used to make more informed decisions about improving linkage to treatment and treatment itself.

References

- Bose, J. (2017). *Key Substance Use and Mental Health Indicators in the United States: Results from the 2017 National Survey on Drug Use and Health*. 124.
- Dickerson, F., McNary, S., Brown, C., Kreyenbuhl, J., Goldberg, R., & Dixon, L. (2003). Somatic Healthcare Utilization among Adults with Serious Mental Illness Who Are Receiving Community Psychiatric Services. *Medical Care*, 41(4), 560-570.
- Fagiolini, A., & Goracci, A. (2009). The effects of undertreated chronic medical illnesses in patients with severe mental disorders. *The Journal of Clinical Psychiatry*, 70(Suppl 3), 22–29. <https://doi.org/10.4088/JCP.7075su1c.04>
- Hoffman, L., Benedetto, E., Huang, H., Grossman, E., Kaluma, D., Mann, Z., & Torous, J. (2019). Augmenting Mental Health in Primary Care: A 1-Year Study of Deploying Smartphone Apps in a Multi-site Primary Care/Behavioral Health Integration Program. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsy.2019.00094>
- Kaplan, K., Solomon, P., Salzer, M. S., & Brusilovskiy, E. (2014). Assessing an Internet-based parenting intervention for mothers with a serious mental illness: A randomized controlled trial. *Psychiatric Rehabilitation Journal*, 37(3), 222–231. <https://doi.org/10.1037/prj0000080>
- Luxton, D. D. (20111031). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. <https://doi.org/10.1037/a0024485>
- National Institute of Mental Health. (n.d.). Mental Illness [Report]. Retrieved November 1, 2019, from <https://www.nimh.nih.gov/health/statistics/mental-illness.shtml>
- National Research Council. 2014. *The Growth of Incarceration in the United States: Exploring Causes and Consequences*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/18613>.
- Olfson, M., Mojtabai, R., Sampson, N. A., Hwang, I., & Kessler, R. C. (2009). Dropout from Outpatient Mental Health Care in the United States. *Psychiatric Services (Washington, D.C.)*, 60(7), 898–907. <https://doi.org/10.1176/appi.ps.60.7.898>