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Emergency Room Utilization of Participants with Mental Health Conditions Enrolled in Health Home Services

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Walden University
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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Large numbers of individuals utilize the ER each year for mental health reasons. The health home agency in this study was designed under the Affordable Care Act with the intention of increasing patient self-management thus decreasing high-cost service utilization. The effectiveness of health homes in reducing mental health-related ER visits has remained unexplored. In this study, the relationship between participation in this program and ER utilization was examined, using the theoretical framework of the Health Belief Model. The sample of 128 health home participants with documented mental health conditions was selected using systematic random sampling. A one-way, repeated-measures *t*-test and a one-way, repeated-measures ANCOVA were used to analyze hospital records for ER visits with a primary or secondary mental health diagnosis. The results indicated that health home participation did not have a statistically significant impact on ER utilization when comparing overall 12-month means or at quarterly anniversary dates when controlling for age, race, and gender. These findings suggested opportunities for improvement in professional practice, identified areas that require further research, and will be used to initiate discussion into the existing and potential value that health homes offer to the mental health clientele being served. Those discussions have the potential to create social change through infrastructure changes that lead to improved service coordination, increased resources for improving access and quality of care, and overall enhancement of outcomes for individuals with mental health conditions.

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Chapter 1: Introduction to the Study

Introduction

In this study, I explored the effect of participation in Schenectady County's health home, Care Central, on ER utilization for enrolled mental health clientele. Previous studies have shown recent increases in ER visits among children, adolescents, and adults with mental health conditions (Nicks & Manthey, 2012; Simon & Schoendorf, 2014). Health homes were designed in an attempt to improve access to care and reduce high cost-utilization through interdisciplinary service coordination for Medicaid-eligible individuals with chronic conditions or severe mental illnesses (New York State Department of Health, 2014a). Schenectady County's health home is one of the first health homes in New York State, and has served the mental health population since its establishment. In order to evaluate progress on both organizational and macroscopic levels, it was important that I first examine the impact of this health home's achievements and identify what opportunities exist for improvement.

This research can provide information to initiate positive social change by supporting better overall care for health home participants with mental health conditions. Specifically, results from this study can spur infrastructure changes within Care Central that lead to improved service coordination for mental health clientele. This, in turn, can decrease eligible participants' use of high-cost services, saving the government significant amounts of money that could potentially be used to increase access and quality of outpatient services and preventative care.

This chapter includes a review of literature that provides background and perspective on health homes and identifies challenges in addressing the needs of the mental health population. In it, I offer an explanation of the problem of disproportionate ER utilization for individuals with mental health conditions, and discuss challenges related to health home evaluation. Next, I present the research questions I used to explore whether or not Schenectady County's health home impacts mental health participants' ER usage, while also considering the role of potential confounding variables. I then provide pertinent operational definitions, followed by a discussion of the guiding theory for this study, the Health Belief Model (HBM), in which I explain how this lens aligns with health home practice. After offering a brief overview of the study's methods and their benefits, I address the scope and delimitations related to generalizability, inclusion and exclusion criteria, and theoretical framework. Finally, I explain the geographical, human, and technological limitations and biases in this study, and identify the steps taken to control for their potentially adverse effects on this study.

Background

In 2011, over 5 million people visited emergency rooms (ERs) in the United States for mental health conditions (National Hospital Ambulatory Medical Care Survey, 2011). With ER utilization numbers on the rise, members of the medical and mental health communities are concerned about quality of care, timely service, rates of medical error, and overcrowding, especially since patients with mental health or substance abuse disorders are 2.5 times more likely to result in a hospital admission (Brauser, 2010; Coristine, Hartford, Vingilis, & White, 2007). Interventions such as the use of a mental health nurse practitioner, computer-based screening, and outreach programs have been implemented in ERs across the world in attempt to identify a "best practice" and address the growing need for additional mental health support in this setting (Gendreau, 2009; Pailler & Fein, 2009; Wand, White, Patching, Dixon, & Green, 2011). In the United States, the Medicaid health home model had been designed with the intent of reducing ER visits by enrollees diagnosed with chronic diseases or mental health conditions.

Health homes were created under the Affordable Care Act (ACA) in order to improve patient care and health outcomes while reducing avoidable high-cost care and lowering Medicaid costs (New York State Department of Health, 2014a). Federal investment continues towards the establishment of a strong primary care network to reduce reliance on specialists for treatment and increase utilization of preventative care (Davis, Abrams, & Stremikis, 2011). Ultimately health homes are an investment in the scheme of an integrated, patient-centered healthcare system that effectively provides appropriate preventative care, with individuals self-managing their health to their utmost ability. As cuts to Medicaid spending loom, the push to develop an efficient healthcare system become more pressing.

In 2013 in Schenectady County, there were approximately 35,225 Medicaid recipients (New York State Department of Health, 2014c). The most recent expenditure reports from Schenectady County in May 2008 alone, indicated a total healthcare expenditure for Medicaid recipients exceeding $16 million that month (New York State Department of Health, 2009). With such high costs associated with the provision of care for Medicaid patients, Schenectady County's health home, Care Central, has focused on the prevention of unnecessary ER usage through person-centered care management that addresses both physical and social needs. There is no current literature reporting the effectiveness of this care model for the population of individuals with mental health conditions. In a 2013 community needs assessment, Schenectady County's mental health provider community voiced significant concern over access to appropriate care for individuals with mental health conditions (Schenectady Coalition for a Healthy Community, 2013). Recent studies on health homes have not delved deeply into achievements and shortcomings, and have offered limited tangible evidence that could be used to support the reduction of ER utilization, especially for those enrollees with a mental condition as a primary diagnosis (Kaye & Townley, 2013). Care Central is among those health homes that require assessment of their ability to reduce ER usage for participants with mental health conditions.

There is a current gap in literature addressing the impact of health homes on their enrolled mental health populations' ER utilization; similarly, Care Central itself is lacking any specific outcome assessment focusing on this population. Evaluating the effectiveness of Schenectady County's health home in the reduction of ER usage will indicate the potential for change that health homes hold for the future. ER use reduction can lead to macroscopic, systematic effects, justifying health homes' continued development and widespread implementation.

By studying the effects of health home participation on the service utilization of participants with mental health conditions, I intended to determine if current methods are best practices for providing appropriate motivation for increased self-management. Also, the comprehensive nature of health homes can reduce stigma by integrating care among providers for mental health patients who typically receive fragmented care (Kearney, Post, Pomerantz, & Zeiss, 2014; Nielsen, 2014). Regardless of results, suggestions can be made into what consistencies or changes may be required in order to maintain or increase desired effects. Specifically, through analysis of the data collected, leaders of Schenectady County's health home may use this study to reflect on the home's outcomes and how its practices may or may not be contributing to the desired results.

Problem Statement

Researchers have described the significant rates of high-cost healthcare utilization among the behavioral health population (Maclean, Haiyong, French, & Ettner, 2014; Mauksch & Fogarty, 2014). According to the most recent figures from the National Hospital Ambulatory Medical Care Survey (2011), over 5 million visits were made to the ER primarily for mental health reasons. Recent rises in ER utilization among this population indicate that individuals with mental health conditions are not having their needs met adequately on an outpatient basis; research indicates that the average number of ER visits in states that expanded Medicaid increased by 5.6%, when compared with the year prior to the expansion (Post Wire Report, 2014). Additionally, a 2014 poll of emergency physicians showed consensus in their thought regarding inadequacy of the treatment of individuals with mental health conditions presenting to the ER (American College of Emergency Physicians, 2014). Because of the flexibility New York State allows in the determination of health home policies and procedures, evaluation is necessary in order to understand program-specific outcomes.

Over the past few years, researchers have collected preliminary data on health homes; however, because of the evolving policies, procedures, and search for best practices, hard evidence is sparse. Although one of the primary intents of the Medicaid health home model is to decrease ER visits by enrollees diagnosed with chronic conditions and serious mental illnesses, there is little evidence currently available to support whether this goal is being met (Bao, Casalino, & Pincus, 2013; Kaye & Townley, 2013). A 2014 report on care management in New York State health homes showed that early data has indicated health homes' general success in reducing emergency usage; however, further research is needed to identify specific successes among different models (Joslyn Levy & Associates, 2014). A single health home can go through numerous changes throughout its implementation, creating additional challenges to its evaluation. Although federal regulations require an eventual assessment of health homes' effect on high-cost service utilization in 2017, there is a gap in existing research literature specifically addressing the role of health homes on ER usage in the population of individuals with mental health conditions (Health homes, 2012).

Purpose of the Study

The purpose of this quantitative, longitudinal, retrospective, cohort study was to examine the relationship between the mental health population's participation in Schenectady County's health home, Care Central, and its ER utilization. For the purpose of this study, ER usage was measured by the number of visits to either of Schenectady County's two ERs. All individuals included in the study had been diagnosed with a mental health condition and had been participants in Care Central for a period of at least

12 consecutive months. The aim of the study was to explore whether there is a correlation between the independent variable of participation in Care Central and the dependent variable of ER utilization.

Research Questions and Hypotheses

RQ1: Is there a reduction in average ER utilization rates among mental health clients enrolled in Care Central when comparing average ER visitation rates one year prior to and following enrollment in the program?

Ho1: Mental health clients' participation in Care Central will not reduce emergency room utilization rates when comparing average ER visits one year prior to and following enrollment in the program.

Ha1: Mental health clients' participation in Care Central will reduce emergency room utilization rates when comparing average ER visits one year prior to and following enrollment in the program.

RQ2: Is there a reduction in average ER utilization rates of mental health clients enrolled in Schenectady County's health home at their three, six, and nine, and twelve month anniversaries, while controlling for age, race, and gender?

Ho2: There is no reduction in average ER utilization rates for Care Central participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

Ha2: There is a reduction in average ER utilization rates for Care Central participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

Theoretical Framework for the Study

The Health Belief Model (HBM) was the theoretical framework I used in this study to explore the relationship between ER utilization and health home participation. This model provided a framework through which to examine how individual perceptions affect health behaviors. I viewed ER utilization data through the lens of the HBM to determine how health home participation may alter perceptions that influence health behaviors. In past studies, researchers have used the HBM with both the behavioral health population and for understanding ER utilization (Saleeby, 2000). Using the HBM was beneficial in providing me direction that furthered a more comprehensive understanding of the results of data analysis.

The purpose of this study was to determine if participation in Care Central affects its enrolled mental health population's ER usage. The outcome variable of ER utilization aligned with self-efficacy. The HBM constructs of perceived susceptibility, severity, barriers, benefits, and cues to action related to the variable of health home enrollment. Moderating variables such as care manager assignment, would also impact perceptions and opportunities for behavior change. Care managers vary between client, and each care manager has their own perceptions and preferences regarding care management, making the method of monthly contact a confounding variable. For example, research on chronic care management of heart failure patients indicated that programs with more frequent in-person contacts were more effective than others (Sochalski et al., 2009). Therefore, certain care managers' may present the participant with additional cues to actions or opportunities to examine their perceptions.

There are many potential complexities aside from the variables examined. Thus, my decision to use a framework that examined perceptions, especially among participants with mental health conditions, was logical. Findings indicate whether participation in Care Central influenced patients' perceptions that contributed to ER utilization. Cues to action for ER usage and self-efficacy for self-management indicated the extent to which the health home program was able to make the desired changes in utilization trends. I designed each of the research questions to examine a potential change in participants' perceptions, as demonstrated by behavior due to care management practices that support self-efficacy. A longitudinal, retrospective design, especially when considering confounding variables, was ideal for determining the time necessary for change in perception and the resulting behavior. In Chapter 2 I provide further explanations detailing the major theoretical propositions that I addressed.

Nature of the Study

The major focus of this study was on highlighting a specific intervention used to address the increased ER utilization rates of the mental health population in Schenectady County. Care Central had been established with the primary intent of decreasing high-cost service utilization (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). The quantitative data necessary to execute this study was extracted from the health home's database, Care Team Connect. Attrition was not a concern because of the eligibility criteria and the retrospective nature of the study. Using a longitudinal, retrospective approach in the research provided me a glimpse into how existing health home practices impacted ER visits, over time, among their enrolled participants who have mental health conditions.

It should be noted that variables of age, gender, race, assigned care manager, and mental health diagnosis had potential to act as confounding variables. In past research, certain Axis II mental health disorders have been linked to increased utilization of high-cost healthcare (Maclean et. al., 2014). Gender, in relation with specific mental health diseases such as depression, has also been known to have an influence on frequency of emergency room visits (Bertakis, Azari, Helms, Callahan, & Robbins, 2000). Also, the assigned care manager may impact ER utilization, as some care managers are more hands-on in their interactions with enrollees, increasing opportunities to develop a trusting relationship to motivate change. I controlled for the variables of age, race, and gender were in the multivariate analyses of the collected data; it was not possible to control for other variables due to inconsistency in reporting. Each factor examined carried the ability to affect the strength of the relationship between participation in Care Central and ER utilization.

In this retrospective cohort study, I examined the relationship between ER utilization and mental health enrollees' participation in health home services. The dependent variable of ER usage was represented by the number of visits made to Ellis Medicine's ERs, both located within the City of Schenectady. Quantitative data on ER utilization was gathered exclusively from Ellis Medicine because it is the sole provider of emergency services in Schenectady County. The independent variables of pre and post health home enrollment were assessed within the population of individuals enrolled in

Care Central. I used a retrospective, longitudinal study with two specific statistical tests to analyze the data, with each research question requiring a separate analysis. The first research question was analyzed using a one-way, repeated-measures *t* test, and the second employed a one-way, repeated-measures ANCOVA. I analyzed data with IBM Statistical Package for the Social Sciences (SPSS) Statistics 21.0.

Definitions

Health home: A comprehensive care management model through which all of an individual's providers communicate with one another so that all of the individual's needs are addressed appropriately. Health home services are provided through a network of medical providers, social service agencies, and community-based organizations (New York State Department of Health, 2014b).

Care manager: An individual assigned to each eligible health home participant who is responsible for overseeing and coordinating access to all medical and social services needed to stay healthy, self-manage health to the utmost ability, and reduce high-cost service utilization (Schenectady Coalition for a Healthy Community, 2013).

Assumptions

This study was based on the following assumptions:

1. All documentation obtained from the Care Team Connect and Soarian Clinicals databases was accurate. The assumption of accuracy included, but was not limited to: diagnoses, dates, and documented enrollment date.
2. Mental health diagnoses provided for each eligible participant in Care Team Connect were clinically-verified, up-to-date diagnoses. Even in using Ellis

Medicine's database, Soarian Clinicals, to list appropriate diagnoses, mental health diagnoses may not have been all-encompassing for each visit (e.g. in one visit the patient's diagnosis is bipolar while the next visit's diagnosis is depression). The diagnoses reflected in Care Team Connect were used to enumerate pertinent ER visits compared prior to and following health home participation.

3. ER visits that were included or excluded were done so based on a complete and accurate list of pertinent diagnoses related to that visit. All ER visits were enumerated using the Soarian Clinicals database from Ellis Medicine. ER visits related to a motor vehicle accident, for example did not apply toward the utilization count unless the visit was directly related to, and coded by, the applicable mental health condition. Only visits with primary and secondary diagnoses were included.

Scope and Delimitations

The scope of this study included mental health patients' unmet needs, as demonstrated by their rates of ER utilization for mental health concerns (Centers for Medicare & Medicaid Services, 2014c). Health homes are designed to work with challenging populations to reduce high-cost service utilization such as ER visits, while improving access to appropriate care. Isolating and examining the mental health population within the health home setting provided me a context for assessing Care Central's progress toward appropriate service utilization for this group. In order to increase internal validity, I examined temporal precedence in the form of a one-way, repeated measures ANCOVA that compared utilization prior to and following Care Central enrollment.

Participants selected for inclusion in the sample had been active and capable participants within the health home consistently throughout 12 months preceding this study. Each participant had completed a health home consent, the FACT-GP and Health Home Functional Questionnaire (HHFQ), and a comprehensive assessment. Engaged and eligible participants should have had at the least one monthly contact with their care manager since program enrollment. If consents were revoked and enrolled health home participants were lost to contact, they would not have met the initial qualifications to be included in this retrospective, longitudinal study.

Delimitations of the study were that each individual in the sample was actively enrolled in the New York State Medicaid program, was at least 18 years of age, and had been diagnosed with a qualifying mental health condition. Qualifying mental health conditions were based on prevalent mental diseases that fall into any of the eight Mental Health 3M Clinical Risk Group (CRG) categories used by New York State to describe health home qualification (Center for Health Care Strategies, 2014). Diagnoses included but were not limited to, schizophrenia, bipolar 1 disorder, major depressive disorder, personality disorder, and anxiety disorder; any of these diagnoses, when assigned to a participant in the Care Team Connect database, initiated automatic assignment of the behavioral health protocol. Socio-demographic criteria other than the aforementioned health home requirements were not employed to further exclude any eligible participants.

Although applicable, I did not use the ecological model, as a contributing theory to guide the research of the study. This model considers the person within the context of four systems: microsystem, macrosystem, mesosystem, and exosystem. The microsystem involves the individual's direct relationships and experiences; the macrosystem focuses on political, cultural, and ideological factors; the mesosystem describes the relationship between microsystems; and the exosystem refers to environments that affect microsystems (Bryans, Cornish, & McIntosh, 2009). The ecological model helps researchers account for factors outside the individual, as well as the relationships and interactions between these various factors. However, its application and examination of the mesosystem, for example, would have distracted from the core focus of all health home functioning: the individual.

Previous assessment indicated that hospitalizations in Schenectady County for concerns that could be treated in the community were as high as 202% of the expected rates (Schenectady Coalition for a Healthy Community, 2013). I used hospital records from Schenectady County's ERs to ascertain the reason for eligible participants' ER visits in order to quantify pre- and post-enrollment utilization rates and trends. Schenectady County was an ideal location in which to examine a health home's functioning because it is one of the first health homes implemented in New York State. Schenectady County, in particular, is home to citizens that are generally less healthy and affluent than the state as a whole (Schenectady Coalition for a Healthy Community, 2013). Because of Schenectady County's distinct features and unique populations, the results of the study are not generalizable to populations outside of this county and this particular health home. Importantly, results displaying any relationship between health home participation and ER utilization for behavioral health participants were specifically indicative of success within this population, and not necessarily Care Central’s entire population. I assumed that results are applicable to Care Central participants with mental health conditions.

Limitations

Vast variety in implementation, policies, and procedures are a result of the general infancy of health home formation. Using outcomes from this study to describe other health homes’ progress in reducing ER utilization, especially those with different populations and procedures, would be irresponsible. The sample that I chose for inclusion was participants with mental conditions. Again, because the variety in diagnoses and concentration of specific populations throughout New York State, applying results to other mental health populations, even those participating specifically in other New York State health homes, was done with caution.

A limitation of concern was I collected data on ER utilization data solely from Ellis Medicine. If participants had attended other ERs in nearby counties, then those utilization rates were not included in the study; therefore, the data I used may not correctly represent the number of ER visits, whether prior or current. I made the decision to utilize only ER data from Schenectady County in order to comply with the Health Insurance Portability and Accountability Act (HIPAA) and patient consents for health home participation.

Reliance on Care Team Connect and Soarian Clinicals databases for accurate data collection did not exclude the opportunity for either human or technological error to influence results. Firstly, diagnoses listed in Soarian Clinicals were assumed to identify pertinent ER visits; however, it was possible that assignment may have been related to diagnostic overshadowing. Diagnostic overshadowing occurs when a patient’s physical symptoms are attributed to their mental health condition, leading to misdiagnosis and delayed treatment (Nash, 2013). A recent qualitative study of four ERs showed that factors such as overcrowding, complex patient presentation, poor communication, and challenging patient behaviors all contributed to misdiagnosis of mental health patients presenting with physical symptoms (Shefer, Henderson, Howard, Murray, & Thornicroft, 2014). Although this represented a concern, I operated under the assumption that participants seen in the ER were accurately diagnosed.

Additionally, all individuals who participated in Care Central and had a qualifying mental health condition may not have been correctly identified or noted in Care Team Connect by their care manager, preventing the opportunity for inclusion in the sample. It is the responsibility of the care managers to load diagnoses for their caseload; however, this presents opportunity for human error. Another potential source of error was the documentation of eligible ER visits to Ellis Medicine in Care Team Connect. To address this concern, I used Soarian Clinicals to gather ER data regardless of whether they were documented in Care Team Connect. Any visit to either of Schenectady’s ERs, even if the patient left against medical orders, was noted in the Soarian Clinicals database.

Construct Validity

It was important to explore the construct validity of the study's variables of participation in Schenectady County's health home and ER utilization. Firstly, looking at the independent variable of health home participation, I controlled for variability through the eligibility requirement of 12 months of consistent health home engagement. This means monthly participation was defined based on minimal state guidelines that also determine the ability of Care Central to bill for services and discharge inactive enrollees. Although the quantity and quality of each monthly contact made between participants and Care Managers were not strictly defined, a minimum requirement and consideration of large caseloads inhibited large degrees of variability in opportunities for active participation.

Secondly, ER utilization was represented by the participants' number of visits to one of two ERs that serve as the main locations for emergency care in Schenectady County. A concern in regards to construct validity was the potential for Care Central participants to decrease utilization based not on the services provided to them via the health home, but due to the understanding that the prevention of high-cost service utilization is a goal of their enrollment. For instance, participants may have avoided going to the ER (or even an ER in Schenectady County) because they had provided their care manager with their consent for me to obtain information concerning their visit. Reliability needs to be considered, especially in situations where the patient had recently moved or had recently changed locus of service utilization from a different health system.

Confounding Variables

Because of the longitudinal design for this quantitative study, it is important to note the threats to internal validity that exist, such as the presence of confounding variables. Confounding variables are factors other than the predictor variable that may affect the outcome variable (Field, 2013). For example, age may have affected ER utilization, independent of whether or not the selected individual participated in the health home. If indeed age was the strongest predictor of ER utilization regardless of health home participation, this study would have had low internal validity. Within this study, the monthly contact between the care manager and the participant was a confounding variable. The degree and quality of contact is related to both the independent and dependent variables, influencing not only ER utilization but also participation in the health home. For example, if participants have a more hands-on care manager, they may have been more likely to continue contact and return calls as opposed to maintaining ongoing contact with a Care Manager who simply calls monthly. Essentially, there was no absolute proof that health home participation was the factor that influenced ER utilization; ER utilization could have been impacted by confounding variables.

Bias

Selection bias. Selection bias occurs when individuals who are initially different from one another and have different prior risks for the outcome are compared (Fink, 2010). Although this study was longitudinal, it is possible that selection bias occurred due to the group of individuals who did not qualify as a result of their inability to actively participate in Care Central for a 12-month period. It is possible that those who were lost to the program, regardless of reason, represented a specific subpopulation, decreasing the generalizability of the current study in representing individuals with mental diseases living in Schenectady County. Also, certain populations may be more reluctant to participate in research or complete programs. In multiple studies of patients with eating disorders, nonresponse bias played a large role in sample attainment (Mond, Rodgers, Hay, Owen, & Beumont, 2004). Since eating disorders are a specific subgroup that will be identified based on the mental disease classifications used, it was important that this group was adequately represented to prevent exclusion from the study.

Maturation. Maturation is natural, biological, or psychological developments that result in changes within individuals (Fink, 2013). This means that maturity of participants with mental diseases, independent of health home participation, could impact their ER utilization. For example, researchers have suggested that maturation is a powerful determinant of psychological abilities (Waber, 1977). I examined results from between group comparisons in this study with reservation and the understanding that pre-existing differences may play an unknown role in any relationships identified.

Omitted Variable Bias. In addition to selection bias and maturation, omitted variable bias could have affected the study if violations of the underlying assumptions occurred. For instance, if sample participants did not receive the minimal contact required by the health home program they may not have had the same opportunity and support to connect with the healthcare system and self-manage. Although monthly contact is a requirement of care managers, frequency and forms of contact vary which may impact activation, the ability to self-management, and ER utilization rates. More direct contact such as face to face meetings may have had a more significant impact of ER utilization than indirect methods such as mail contacts. I did not address method of contact in this study because of documentation issues.

Significance of the Study

The efficiency of Care Central in increasing self-management in its population of individuals with mental health conditions can be examined via the association between ER utilization and participations. If results from this study indicate that the health home program was successful in reducing ER usage among this population of its participants, they reflect favorably on the current design and function of Schenectady County's health home. Since one of the primary goals of health homes is prevention of avoidable ER use and an increase in collaboration and the integration of services, quantitative data showing that current practices are succeeding are invaluable to the future of this program (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). Results supporting an association between a reduction in ER usage and health home participation have the potential to justify further funding and continued investment of resources. On the other hand, outcomes demonstrating a lack of an association may indicate the need for changes to increase efficiency. Without an evaluation or study of these outcomes specific to participants with mental diseases, a clear picture of the health home's effects cannot be gained, and their impact may be limited by a lack of understanding of the current state of the program.

This study has the potential to support social change within Schenectady County as well as New York State, especially in regards to its current health home implementation and practices. Health homes in other states and areas of New York State are focused on either those with chronic medical conditions or participants with mental conditions; Schenectady County's health home addresses both. Unlike many other health homes, Care Central does not have a designated unit dedicated to this population, and caseloads are not specifically limited.

Examining the results of the health home's work with this population may set a precedent in how to increase likelihood of achieving general goals of increased self-management with this considerably difficult population. Infrastructure changes may result, enabling more appropriate and meaningful service coordination to individuals who are participants in Care Central and diagnosed with a mental disease. Best practices associated with the procedures and general care management of individuals will be supported or discouraged, either way providing valuable direction for future practices. The administration of services can be shaped by the results of the study, ultimately serving as a catalyst for positive change for individuals with mental diseases living in Schenectady County and New York State.

Summary

The anticipated effect of health homes in providing comprehensive, patient-centered care and decreasing high cost service utilization is well documented in both scholarly and legal arenas. A major deficit in current knowledge is actual outcome-focused data which specifically represents a health home's ability to longitudinally affect

ER usage by health home participants with mental diseases. Past research on medical homes' effect on this population has shown promising results; however, further research is needed on health homes' effectiveness in reducing ER utilization by behavioral health participants (SAMHSA-HRSA, 2012). Schenectady County's health home was chosen because it was among the first established health home in New York State. To guide the study, I used the HBM because it has been proven to be a valuable tool, especially in understanding perceptions that lead to ER utilization among individuals with mental health conditions (Saleeby, 2000).

In this quantitative, longitudinal study, I used a retrospective cohort design to examine mental health participants' ER usage prior to, quarterly during, and following health home participation. Demographic data such as age, gender, and race were analyzed as moderating variables. No contact was made with participants in the health home regarding involvement in this study. However, I obtained IRB approval from both Ellis Medicine and Walden University prior to the initiation of data collection. There are numerous social change implications including increasing self-management among individuals with mental diseases, reducing inappropriate ER utilization and associated costs, and evaluating the infrastructure of currently established health homes particularly in regard with its work with the behavioral health population.

In Chapter 2, I review existing, pertinent information related to the establishment of health homes, health home policies and procedures, variability in implementation, health homes and their role in mental health care, and specifically Schenectady County's health home Care Central. In the next chapter, I also provide a thorough explanation of the HBM, its relationship to health homes and ER utilization, and its application as the study's theoretical framework.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative, longitudinal, retrospective, cohort study was to examine the relationship between the mental health population's participation in Schenectady County's health home, Care Central, and its ER utilization. Information provided within the sections of this chapter further support how integral this study was in understanding if one of the first established health homes in New York State is successfully increasing self-management among its mental health population, as evidenced through an examination of ER usage. I chose the variables of health home participation and ER utilization because of their relationship to the research questions and the lack of existing literature on this topic.

Researchers have shown that people with mental conditions disproportionately use emergency room services when compared to the general population. According to Maclean et al. (2014), there are associations between Axis II mental health disorders and high-cost utilization. Cawthorpe, Wilkes, Guyn, Bing, and Lu (2011) examined 9 years of billing data, which showed increased health-related costs among the mental health population. Mauksch and Fogarty (2014) discussed increasing consensus and support for behavioral health integration across disciplines. Health homes, formed as a result of the PPACA, attempt to address the comprehensive needs of individuals with mental conditions; however, there is a lack of data supporting their effectiveness.

In this chapter, I describe the literature review search strategy, explore the HBM as the theoretical foundation of this study, examine key constructs, and provide a summary of what is known and the gaps in knowledge that I addressed. I used the literature reviewed throughout this section to establish a baseline of knowledge needed to understand the purpose and results of the study.

Literature Search Strategy

The Walden University Online Library was the primary resource I used to obtain peer-reviewed articles for use in this study. The majority of information was accessed through the CINAHL and MEDLINE Simultaneous Search database. Other databases I accessed include Academic Search Complete, PsychINFO, and PubMed. Key search terms included the words: *health home, emergency room, mental, behavioral health, Affordable Care Act, New York State, and Health Belief Model (HBM)*. I conducted most searches using one key search term and at least one additional secondary term (often another key search term), as illustrated in Table 1.

Table 1

Literature Review Search Themes

Key Search Terms	Search Terms
Health home	*ER, ED, emergency room, mental, behavioral, Affordable Care Act, PCMH, New York State
Emergency Room (or ER or ED)	*mental, behavioral, psychiatric, Medicaid, HBM, health belief model, overcrowding, efficacy
Mental (or behavioral, psychiatric)	*ER, ED, emergency room, health home, Medicaid, disparity, HBM, healthy belief model, efficacy
Health Belief Model (or HBM)	*mental, psychiatric, behavioral, ER, ED, emergency room, efficacy

Summary of Literature Review Using Academic Databases

Depending on the isolation or combination of terms used, the number of usable articles ranged from 4-20, with total results from each search ranging between 6 and 1,069 articles. Interestingly, similar key terms such *emergency room* and *emergency department* often produced different results. Each usable article also supplied numerous additional sources within its content and reference section. I obtained books containing background on health homes and a copy of the PPACA from the local library in Clifton Park, New York. The PPACA itself provided the specific wording of the federal legislation from which health homes were formed.

Information was scarce on Care Central's outcomes and the effect of health homes on behavioral health population; this led to the need to examine other sources that may fill the existing gaps in knowledge in these areas. To view background and information on health homes, I accessed websites including those of health homes in New York City and Vermont, in addition to the New York State Department of Health (NYSDOH) and the Centers for Medicare and Medicaid Services (CMS) website. I also followed up on original resources listed in secondary sources such as the Centers for Disease Control (CDC) website to validate the accuracy of the information presented.

The majority of existing studies that I used in the literature review were published within the last 5 years; however, I used certain backdated information to provide an important and still-relevant historical perspective. I kept records of databases searched and number and relevancy of results found; articles were filed under topic-specific headings. Many articles I used in preparation of the literature review are not directly referenced in this chapter because they lacked specific value for this study.

Theoretical Foundation

The HBM provided the theoretical framework for my examination of the impact of Care Central on mental health participants' increased self-efficacy and self-management, as shown by reduction in their emergency room utilization. The HBM was developed in the 1950s by social psychologists Hochbaum, Rosenstock, and Kegels working in U.S. Public Health Services to explore the lack of engagement in community-based tuberculosis screening programs (ETR, 2015). The HBM is a psychological model that describes perceived barriers, benefits, severity, susceptibility, cues to action, and self-efficacy in order to better understand how to initiate positive behavioral change (Aki et al., 2014; Naghashpour, Shakerinejad, Lourizadeh, Hajinajaf, & Jarvandi, 2014). Constructs associated with the HBM have been used extensively to gain a better understanding of target populations' perceptions in order to increase readiness to engage in health-promoting behaviors (Purtzer, 2012; Sui, Turnbull, & Dodd, 2013).

My use of this model in the study provided insight into the primary factors that motivate an individual's health decisions and behaviors (Aki et al., 2014). Although there was no specific literature on the use of the HBM within health homes, previous studies have demonstrated the HBM's effectiveness in increasing self-management for a variety of potential conditions and actions that impact health home participants such as diabetes and heart failure, and skills like stress management, nutrition education, and routine HIV counseling and testing (Baghianimoghadam et al., 2013; King, Singh, Bernard, Merianos,

& Vidourek, 2012; M, A, & AR, 2010; Naghashpour et al., 2014; Nothling, & Kagee, 2013). In essence, the HBM theorizes that individuals are more likely to perform a recommended behavior if they believe themselves to be susceptible to disease (perceived susceptibility), think the disease can have serious consequences (perceived severity), perceive barriers to preventive practices as inferior to perceived benefits, and receive a cue to action (Anagnostopoulos, Buchanan, Frousiounioti, Niakas, & Potamianos, 2011). The HBM associates stronger self-efficacy for self-care and confidence in ability to take action and prevent disease with improved health (Anagnostopoulos et al., 2011). The HBM is based on the following two assumptions: (a) individuals cognitively value avoiding the health condition, and (b) individuals expect that taking action will prevent the health condition (Adams, Hall, & Fulghum, 2014). The major hypothesis of the HBM asks if an individual is more likely to change their behavior if the outcome expectation/behavior is desirable (Alyaemeni, 2015). The HBM has been used extensively to study, predict, and intervene in various health behaviors within numerous populations (Aki et al., 2014; Almadi et al., 2015; Noriko et al., 2014; Wang et al., 2014; Zhang, Dalal, & Wang, 2013). To this day, the HBM remains one of the most widely used theories in health education and promotion (Anagnostopoulos et al., 2011; Baghianimoghadam et al., 2013; Naghashpour et al., 2014).

Each care manager working within the health home seeks to understand participants' perceptions in order to motivate positive behavior change; typically, this is achieved through motivational interviewing. The HBM and motivational interviewing are closely aligned, with motivation for behavior change being influenced by a myriad of factors such as beliefs, attitudes, values, priorities, physical and social implications, and cost (Mosler, 2012). Previous studies have shown that it is useful for care managers to use motivational interviewing to support self-efficacy when using the HBM to identify challenges (Anagnostopoulos et al., 2011). In my study, any changes in the dependent variable of ER utilization not only indicate the health home's impact on perceptions behind the change, but also changes in the self-efficacy of health home participants. Given that this was a pilot study, I did not attempt to delve deeply into the exploration of each construct in its relation to ER usage; however, the macroscopic picture of whether and how health home participation affects ER utilization indicated whether or not further exploration into each concept is *currently* warranted. For example, if results demonstrated that Schenectady County's health home had no impact on ER usage, then changes in practices may be desirable before a reassessment. On the other hand, if a decrease or increase in visits was demonstrated, researchers may want to continue to specifically explore how participation has affected each construct. Understanding the predominant perceptions that influence high-cost service utilization aided in the design of interventions that specifically target that construct.

Constructs of the HBM guided this study by providing lenses for understanding how the results of the research questions can be indicative of HBM constructs upon which health homes were founded. Previous researchers have examined the effects of emergency room interventions on self-efficacy, patients' readiness to change in the ER setting, and decreased self-efficacy among ER patients (when compared with community counterparts), suggesting the importance of the relationship I have examined through this study (Wand et al., 2012; Dohnke, Ziemann, Will, Weiss-Gerlach, & Spies, 2012; Joyner et al., 2012). The first research question's purpose was to compare ER utilization of Care Central participants with mental health conditions prior to and following enrollment. The HBM, in this case, provided perspective on how any demonstrated health behavior change was linked to changes in self-efficacy, perceptions, and cues to action. Next, the I viewed the second research question, which sought to describe trends in ER utilization following health home enrollment, in terms of how perceptions and self-efficacy have evolved, and how cues to action have been developed and perceived. I examined modifying variables of age, race, and gender. Depending on impact, modifying variables can be further studied in subsequent research to determine the specific construct's relationship by care manager. Ultimately this study can be used to build upon existing theory application within the ER setting to explore a specific intervention's impact on self-management and self-efficacy.

The HBM was considered important for the study because it provided a framework for how to understand the views of individuals (regardless of mental condition) in order to increase likelihood of positive behavioral change. In essence, this is exactly what health homes were established to do: find a meaningful way to increase self-management, thereby reducing inappropriate and unnecessary high-cost service utilization. Care managers within the health home use strategies such as motivational interviewing and face-to-face interaction to build rapport to 'meet the participant where they are at' in order for an understanding of how to elicit the desired behavioral change can be achieved. The HBM is the underlying model that guides health home practice and therefore, provided valuable insight into how the results of the study are meaningful to current and future practice.

The HBM was the theoretical foundation for this study. As previously mentioned there are six constructs associated with this theory: perceived barriers, benefits, severity, susceptibility, cues to action, and self-efficacy in order to better understand how to initiate positive behavioral change (Aki et al., 2014; Naghashpour et al., 2014). Each construct is related to health home functioning, playing a valuable role in the assessment that care managers perform to understand how to best motivate patients to increase self-efficacy. It was predicted that there would be a negative correlation between each construct and ER utilization of health home patients with mental health conditions. For example, if the constructs that ultimately contribute to self-efficacy increased, then ER utilization would decrease because participants are better able to manage their health independently and better understand appropriate use of the ER. In the following sections, constructs of the HBM are individually examined and related to how they are and can be used to understand health home participants, providing perspective on the indications of the study's results.

Perceived Susceptibility

Perceived susceptibility refers to individuals' subjective risks of acquiring a condition (Rosenstock, 1966; Alyaemeni, 2015). Understanding the role of perceived susceptibility is one of the main constructs of the HBM because it indicates a macroscopic relevancy of behavior change. For example, if a bipolar patient smokes two packs of cigarettes a day but believes that they have absolutely no chance of acquiring lung cancer or any smoking-related illnesses, commercials depicting the effects of smoking would not have a significant impact on the individual. This is not to say that these commercials are ineffective in eliciting feelings of disgust and pity; however, for the individual who perceives no susceptibility for these conditions, there is little likelihood of the desired behavior change. Past research has demonstrated interventions that focus on perceived susceptibility have been successful, especially when individual factors such as current perception and age are considered (Updegraff, Brick, Emanuel, Mintzer, & Sherman, 2015).

The HBM has also been used alongside motivational interviewing to better understand patient outcomes such as medication adherence (Williams & Manias, 2014). Care managers operating within health homes use motivational interviewing to gauge participants' perceived susceptibility in order to create a more realistic view of actual susceptibility and design appropriate goals and interventions. The ability of perceived susceptibility to inhibit self-management practices and strive to empower self-management through accurate perceptions of the realistic outcomes of participant behavior is recognized by health homes.

Perceived Severity

Perceived severity is the belief in the extent of harm that can result from an action or behavior (Hoseini, Maleki, Moeini, & Sharifirad, 2014). Perceived severity is an important construct illustrated by the HBM because behavior change can be restricted if perceived severity is minimized. For example, if a patient with major depressive disorder is diagnosed with Type II diabetes they need to be properly educated on the severity of this diagnosis and its potential complications. Many times diagnoses are given without a comprehensive or comprehensible explanation of seriousness given; without this understanding, individuals may engage in behaviors that further increase the severity of their condition and put them at risk for further complications. Similarly, if individuals perceive others' situations as less severe, they are less likely to assist (Bennett & Banyard, 2014). Past studies demonstrated the relationship between self-efficacy and perceived severity; it has also been suggested that higher perceived susceptibility is associated with appropriate self-care behaviors in individuals with chronic illnesses (Aki et al., 2014; Anagnostopoulos et al., 2011; Ayele, Tesfa, Abebe, Tilahun, & Girma, 2012). Health homes, using expertise derived from the knowledge and experience of care managers aim to instill an accurate portrayal of severity for and among all individuals with relevant conditions. Furthermore, with an accurate perception of severity, participants in the health home will be more receptive to guidance on how to best manage their conditions.

Perceived Benefits

Perceived benefits reflect an individual's opinion of why a behavior or action is desirable. Through the identification of key perceived benefits, meaningful interventions can be designed that motivate lasting change (Boustani, Frazier, Hartley, Meinzer, & Hedemann, 2015). It is important for health homes (specifically care managers) to assess and acknowledge an individual's opinion of how a behavior or action might be 'good' for them to ensure perceptions match reality. For instance, if a care manager working in the health home wants to promote medication adherence they can discuss the positive effects that compliance would have on the individual. The care manager can explore if and what the current benefits are as viewed by the participant, as well as reinforce the accurate perceptions, explore misconceptions, and explain additional benefits participant may not have already been aware of. Previous research has indicated the ability of perceived benefits in influencing health-enhancing practices (Gho, Munro, Jones, & Steele, 2014). Identification of perceived benefits can also be useful in identifying how to differentiate interventions (Ford, Bryant, & Kim, 2013). Motivational interviewing, a primary practice of care managers, is a strategy used to guide participants in identifying benefits of certain behaviors and actions; these techniques are used by care managers to increase the likelihood of their participants' engagement in health-promoting behaviors.

Perceived Barriers

Perceived barriers are an individual's belief of the costs and restrictions associated with an action or behavior (Alyaemeni, 2015). Previous studies reinforce the important contributions that correct identification of perceived barriers can have on the effectiveness of an intervention (Gho et al., 2014; Jimenez et al., 2015; Oh, Park, & Seo, 2013). For example, research among a sample of Latinos with serious mental illness (SMI) demonstrated that culture influence on food was a major perceived barrier of healthy eating (Jimenez et al., 2015). Through understanding the perceived barriers individuals have in adhering to treatment or making health-promoting choices, relevant interventions can address barriers that are important to the target audience. In a previous study on hemodialysis adherence, a major emerging recommendation was intervention development based on decreasing perceived barriers and increasing self-efficacy (Oh et al., 2013). It is important to note that perceptions do not always align with reality and not all perceived barriers are difficult to resolve. For example, a schizophrenic patient may view transportation as a barrier to attending court ordered treatment, unaware that they have access to programs that provide free transportation. If this is the patient's only barrier to appropriate care, it can be resolved by providing immediate resources without necessarily requiring long-term follow-up. Care managers operating within health homes typically discuss perceived barriers with participants prior to enrollment to evaluate eligibility. Throughout a participant's enrollment in health home, perceived barriers are constantly being evaluated and solutions are collaboratively being found.

Cues to Action

Cues to action are “accelerating forces” that increase an individual's feelings to take action (Hoseini et. al., pg. 648). The ‘cues to action’ construct was added to the HBM after the initial four constructs in order to better understand how to stimulate the desired behavior change (ETR, 2015). Cues to action can be physical or psychological and may be based on the previously mentioned constructs of perceived susceptibility, severity, barriers, and benefits. If a care manager operating within the health home wants to motivate the participant with personality disorder to retain a primary care physician, cues to action play an important role in doing so. Physical cues to action like pain and discomfort may increase participant’s readiness to see a medical doctor. Also, psychological cues may motivate the action to establish the primary care physician such as the comfort associated with knowing that if feeling sick, a same-day visit can be made. Care managers are expected to use strategies such as motivational interviewing to engage participants in identifying cues to action the support the desired positive behavior change that support self-management and less reliance on high-cost service utilization at the time of crises.

Self-Efficacy

Self-efficacy is the confidence an individual has in their ability to take action (Alyaemeni, 2015). In 1988 self-efficacy was added to the HBM in order to better adjust to challenges related to initiating change in established habits (ETR, 2015). Understanding the role of self-efficacy's impact on behavior change will increase the likelihood of the successful initiation and maintenance of behavior change (Schwarzer, Luszczynska, & Lippke, 2011). Self-efficacy increases after initial successes, increasing maintenance and resilience even in the face of obstacles (Warner et al., 2014). Strategies to increase self-efficacy among participants in health homes include education, encouragement, and guidance. For instance, an individual with panic disorder may have low self-efficacy when it comes to their ability to go to the local Department of Social Services to apply for food stamps. The individual may believe they will have a severe panic attack if they attempt to go; however, with the proper education and guidance care managers can support the individual in implementing coping strategies or may find alternate solutions that increase self-efficacy to complete the task in a safe manner. Past research often looks to explore intervention success through increases in self-efficacy, examine the potential mediating effects of self-efficacy on behavior, and gauge self-efficacy in order to increase successful, independent disease management outside the hospital setting (Greco et al., 2014; Kim, Ham, Kang, & Jun, 2014; Mitchell & Fraser, 2014; Tay, Drury, & Mackey, 2014; Weekes, Haas, & Gosselin, 2014; Yeom, 2014). Ultimately, health homes were designed to create self-efficacy so that individuals can self-manage their medical and psychological conditions to require less reliance on potentially preventable high-cost service utilization.

The HBM and the Mental Health Population

As previously discussed, the constructs of the HBM work hand-in-hand with empowering self-management and self-efficacy; self-efficacy beliefs are central to mental health, with self-perception greatly impacting emotional health (Dupere, Leventhal, & Vitaro, 2012). Health homes attempt to address individuals' needs in a comprehensive nature so it is important that the frameworks used in the assessment of these programs accordingly capture the true impact of health homes on various aspects of health-enhancing behavior for mental health patients. The HBM has been used to examine practices and compliance among patients within the behavioral health population (Cook et al., 2015; Pratt et al., 2013). For example, past research has examined the role in self-efficacy among individuals with serious mental illnesses when looking at tobacco retailer location (Young-Wolff, Henriksen, Delucchi, & Prochaska, 2014). Young-Wolff et al. (2014) indicated that individuals with mental health conditions are somewhat targeted by tobacco vendors, leading to increased dependence and lower self-efficacy for quitting. Using these results and individual concepts of the HBM framework, researchers can implement interventions that are meaningful to increasing change, in this case calling for environmental regulation (Young-Wolff et al., 2014). The HBM was used in a similar way to guide the current study on the effectiveness of health homes in reducing emergency department utilization by patients with primary mental health diagnoses.

Utilizing the HBM influenced the approach, methods, interpretations and conclusions of the study. The framework of the HBM was beneficial in creating change because it examines current perceptions in order to eliminate the barriers that exist to optimal health. Mental health practitioners and service providers can benefit from determining how a client's perceptions can influence an intervention's ability to achieve desired results (Pratt et al., 2013; Wagstaff, 2007). The HBM also affected the methods through the tailoring of patient satisfaction questions that explore each of the six constructs of the HBM. Past research confirms the HBM can provide the framework for reliable and valid instrument implementation in work with the mental health population (Saleeby, 2000). Interpretations and conclusions were again influenced by the HBM by the application of the importance of perceptions and how those perceptions have changed throughout participation with the health home. If behaviors and mental health treatment compliance was positively influenced by participation in the health home, understanding the major constructs in health beliefs where change occurred would be beneficial in future research and interventions that seek to further increase compliance.

Mental Health in the United States

Individuals with mental health conditions have distinct needs that require recognition and coordination between professionals in order to enable better health and quality of life. According to Bartels et al. (2013) and Mauksch & Fogarty (2014), there is a clear disparity in health, as well as increased morbidity and mortality rates among the mental health population. Individuals with severe mental health issues have a life expectancy 8 to 32 years shorter than those without mental illnesses (Bartels et al., 2013). On an average, adults with severe mental illnesses die 25 years earlier than the general population (Parks, 2006). Additionally, the mental health population is more likely to have chronic conditions, with vulnerability increasing with the presence of each physical illness (Mauksch & Fogarty, 2014). Alongside their increased susceptibility, individuals with mental health conditions demonstrate disproportionate use of healthcare dollars, indicating the importance of mental health intervention as both a patient-focused and cost-containing approach (Mauksch & Fogarty, 2014).

Disparities in Mental Health Susceptibility, Diagnosis, and Treatment

Major ethnic and cultural disparities exist in the assessment and treatment of individuals with mental illnesses (Cook et al., 2014; Kohn-Wood & Hooper, 2014; Meyer, Saw, Cho, & Fancher, 2015). Race can play a major role in access to and participation in the appropriate mental healthcare. In the United States, minority groups are less likely to receive psychiatric treatment than Caucasian Americans (Cook et al., 2014; Kohn-Wood & Hooper, 2014). African Americans with mental health conditions are more likely to receive emergency services and less likely to be diagnosed at the primary care level (Egede et al., 2014). Additionally, Eack & Newill (2012) found that African Americans were less likely to return to work and showed less improvement in global functioning and activation. Furthermore, researchers have indicated that older black and Latinos are in need of tailored interventions that address existing disparities in treatment initiation and adequacy (Jimenez, Cook, Bartels, & Alegria, 2013). In addition to this research, Simning, Wijngaarden, and Conwell (2011) detailed that a higher proportion of African Americans living in public housing suffer from mental illnesses, with fewer receiving treatment. Nguyen (2011) found that Asian American adults utilize mental health services significantly less than the general population.

Income, age, and gender can also affect likelihood of acquiring and treating mental illness. Income affects psychiatric care, aside from the obvious challenges associated with affording healthcare, copays, deductibles, and medications. Periods of recession can lead to increased risk of mental health condition (Dagher, Chen, & Thomas, 2015). Income has been associated with an increased risk of psychiatric conditions (Santiago, Kaltman, & Miranda, 2013). Studies indicate gender differences exist in mental health outcomes (Brugha et al., 2013; Chang et al., 2011; Nawka et al., 2013). Specifically, Dagher et al. (2015) indicated increased anxiety rates following recession among females, specifically those living in the Northeast or Midwest when comparing the U.S. as a whole (Dagher et al., 2015). In recognition of gender disparities, new tools have been developed to accurately measure positive mental health in women in a manner that is sensitive specifically to gender (Wang, Johnson, Shu, & Li, 2014). Age can also contribute to diagnostic overshadowing, for example in the case of elderly individuals whose physical ailments are attributed to their depressive symptoms (Holm, Lyberg, & Severinsson, 2014).

Chronic physical ailments also impact mental health (Mauksch & Fogarty, 2014). In a 2014 study, researchers found that individuals with diabetes were more likely to have a mental health conditions than those without diabetes (Egede et al., 2014). Similarly, people with multiple sclerosis have increased chronic conditions as well as higher potential for mental health conditions (Simpson, McLean, Guthrie, Mair, & Mercer, 2014). Mental health can also impact treatment initiation, such as demonstrated in a sample of overactive bladder patients (Chrystal et al., 2015). All in all, researchers discuss the clear disparities in mental health as well as numerous factors that can contribute to increased susceptibility.

Existing Gaps in Mental Healthcare

The presence of gaps in care indicates the existence of numerous and often-times confounding barriers that inhibit appropriate care of psychiatric conditions. Challenges to patient engagement into appropriate mental healthcare include health literacy, perception of current health and needs, and the degree of patient-centered communication (Bartels et al., 2013). One specific challenge that exists is the establishment of a collaborative patient-provider relationship. Silos of healthcare detract from comprehensive quality of care for individuals with mental health conditions. It is important for patients to have rapport with their providers in order to better communicate their needs, concerns, and expectations. Barriers to communication are meaningful because they can result in reliance on other methods of care that is costlier, such as emergency room visits (Bartels et al., 2013). To encourage rapport with outpatient providers, many emergency rooms and community agencies develop programs that identify the mental health population within these settings to provide appropriate support.

Each environment can offer specific challenges in effectively treating the mental health population. As previously mentioned, the ER can often become a place where individuals with psychiatric afflictions seek care. A major issue that may affect care of individuals in the ER setting is diagnostic overshadowing. Upon presentation, patients' physical symptoms are attributed to their mental illness, leading to misdiagnosis and delayed treatment (Shefer et al., 2014). Diagnostic overshadowing is often the result of stigma, lack of education and training, or lack of confidence in clinical skills and symptom recognition (Nash, 2013). The ability to triage acute psychosis quickly and accurately can prevent adverse patient outcomes and increase safety for patients and staff alike (Sands et al., 2014).

Even if comprehensive services are offered, individuals with mental health conditions need to perceive that their needs are being met, making involvement of the target population imperative (Miyamoto, Hashimoto-Koichi, Akiyama, & Takamura, 2015). Existing disparities can be amplified by patient perception and how they understand their physicians and their roles (Meyer, et al., 2015). For example, a major predictor of ER utilization in a study of homeless adults was perceived unmet mental health needs (Chambers et al., 2013). Further research with the homeless population indicated how to best meet the needs of the homeless population with severe psychiatric symptoms: a tailored approach (Chrystal, et al., 2015). Without the active engagement of individuals with mental health conditions, existing programs may not be utilized and/or rates of high-cost service utilization will remain unchanged.

Mental health conditions have been directly related to greater health-related costs (Cawthorpe, Wilkes, Guyn, Bing, & Lu, 2011). As mental health care continues to increase substantially, overall costs follow the trend, showing significant increase

(Schenectady Community Action Program, 2011). Estimates suggest that only about 20% of adults with psychiatric disorders are seen by mental health professionals, many preferring to receive treatment from their primary care physician (Unutzer, Harbin, Schoenbaum, & Druss, 2013). Although initiatives to incorporate stronger psychiatric support within general practice offices have begun, physicians without specific background in mental healthcare are not always comfortable with providing services outside of their area of expertise (Pomerantz & Sayers, 2010; Lam, Lam, Lam, & Ku, 2013; Hooper, 2014). Individuals with persistent mental illnesses see specialists more frequently; however, they also have higher mortality rates with restricted access to medical care (Unutzer, Harbin, Schoenbaum, & Druss, 2013). Researchers demonstrate that collaborative care models have been successful and cost-effective in improving the care of mental health patients across populations and settings (Unutzer et al., 2013).

Development of Health Homes

Health homes are collaborative care models implemented under Section 2703 of the Patient Protection and Affordable Care Act (ACA). The intent of this initiative is to support the use of appropriate care through a comprehensive model that seeks to empower individuals to self-manage their health to the best of their ability. To aid in program design, the Center for Health Care Strategies (CHCS) sponsored the meeting of a group of Medicaid officials from five states, regional quality alliance representatives, officials from CMS and SAMHSA, and other experts (McGinnis, 2011). During this planning meeting, six considerations were identified: leverage of existing resources, built-in flexibility, accountability measures, alignment of financial incentives, transparency and stakeholder involvement, and focus on sustainability (McGinnis, 2011). These tenets were helpful in guiding the planning and development of health homes throughout the country.

Based on federal law, states are responsible to produce State Plan Amendments (SPAs) when enacting Section 2703 to individually define how they envision the evolution of health homes (Miller & Stanley, 2015). States are expected to describe in their SPAs how their state's health home programs adhere to federal health home guidelines; however, even with this requirement there is ample room for interpretation (U.S. Department of Health & Human Services, 2010). Each specific state can customize their model within their SPA, ensuring that the design is appropriate to the context of need in that particular state (Moses & Ensslin, 2014). States such as New York, opted to provide general policies reflective of the basic tenets of Section 2703, allowing for vast interpretation across counties (Miller & Stanley, 2015). Just as addressing the medical and social needs of individuals requires flexibility, individual health homes provide the same leniency in creating a meaningful and relevant health home program to accomplish the goals of comprehensive care management.

New York State

In 2011, the Centers for Medicare & Medicaid Innovation waiver was awarded to New York State (NYS) to pilot health homes for vulnerable populations (Joslyn Levy & Associates, 2014). NYS was one of six states chosen for early implementation of health home programs. Of the six states chosen, NYS was one of three whose program offered broad services, meaning they included enrollees with chronic medical conditions, serious mental illnesses, and substance abuse disorders (Moses & Ensslin, 2014). In NYS, health homes have been identified as responsible for ensuring patient-centered care as well as reducing avoidable healthcare costs through collaboration and integrated services (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). NYS health homes supplement existing patient-centered medical homes (PCMHs) and support the development of Accountable Care Organizations (ACOs).

Based on prior initiatives to better understand existing need and best practices, New York State health homes have been shaped by research. Programs that have influenced health home implementation in NYS are patient-centered medical homes (PCMHs), targeted case management (TCM), managed addiction treatment services (MATS), and the Comprehensive Care Management Program (Center for Healthcare Strategies, 2012). The Chronic Illness Demonstration Project (CIDP) also played a large role in shaping the application and operations of NYS health homes (Center for Healthcare Strategies, 2012). In 2008, the CIDP was developed to reduce costs and improve health outcomes for fee-for-service Medicaid beneficiaries with chronic illnesses (Center for Healthcare Strategies, 2012). Findings indicated some key components that contributed to success: dedicated staff with social service expertise, a specific housing coordinator, a high-touch, highly accessible interdisciplinary team, inclusion of peers, patient-centered care model, partnership with community organizations, and the ability to coordinate medical, behavioral and social services (Center for Healthcare Strategies, 2012). Using the findings from this project, NYS policymakers have promoted specific strategies to increase health home success such as networking with existing community resources and identifying an appropriate workforce to comprehensively address the myriad needs of the target population.

There are many areas of variability between NYS health homes, one being age of eligibility. Some health homes in NYS work with children and families while others are work only with adults at least 18 years and older. Differences in service location and locus of care exist among NYS health homes. Many health homes are hospital-based while other work closely with healthcare providers without any embedded staff present in those locations. Health homes may deliver services in an office-based setting primarily or may prefer street-level and community-based engagement (New York State Department of Health, 2012). In essence, NYS's lack of strict definition of services and operations provide health homes with the necessary flexibility to create tailored interventions that best address the needs of their specific populations.

Care Central: Schenectady County's Health Home

Care Central is the designated health home for Schenectady County. Schenectady is located in the Capital Region of New York State. According to 2013 data Schenectady County is the second smallest county in NYS with a population of over 155,000 residents (U.S. Census Bureau, 2015). Schenectady County is more ethnically diverse, especially within the City of Schenectady, where there has been a 71.7% increase in the Asian population and a 47.8% increase in blacks/African Americans over a period of 10 years (Schenectady Coalition for a Healthy Community, 2013). The most current available data from the 2000 census indicated over 10% of Schenectady County residents and over

20% of City of Schenectady residents live in poverty (Schenectady Community Action Program, 2011). Schenectady County's only ERs are located in Schenectady at Ellis Medicine. Within the main hospital there are inpatient adolescent and adult psychiatric units where necessary admissions can be housed. Care Central is currently the sole health home offering services to Schenectady County.

Care Central was established in December 2011 as one of NYS's first certified health homes (American Hospital Association, 2013). Prior to its establishment, there were two medical homes in Schenectady County: one at the former St. Clare's Hospital on McClellan St and another at Hometown Health, which had been designated a patient-centered medical home (PCMH). In alignment with a provision in the Affordable Care Act, a strategic planning retreat in 2010 involving Visiting Nurse Services (VNS), Ellis Medicine, and community partners developed a plan to implement a health home program (American Hospital Association, 2013). VNS submitted for NYSDOH funding in September 2011 and received approval in December 2011. From there, Care Central developed through teams of professionals from a variety of settings to comprehensively address the health needs of individuals who meet health home criteria.

The Purpose of Health Homes

Health homes have been identified as responsible for ensuring patient-centered care as well as reducing avoidable healthcare costs through collaboration and integrated services (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). According to the CMS, there are three goals of health homes in the pursuit of improving healthcare: improving population health, improving experience of care, and reducing costs of healthcare without any harm (U.S. Department of Health & Human Services, 2010). Services include "comprehensive care management, care coordination and health promotion, comprehensive transitional care from inpatient to other settings, including appropriate follow-up: individual and family support, referral to community and social support services, and the use of health information technology to link services (U.S. Department of Health & Human Services, 2010). The intent of this model is to take a whole-person approach that avoids compartmentalizing individual aspects by instead addressing all of the clinical and non-clinical needs of a person (U.S. Department of Health & Human Services, 2010). Health homes were designed to provide intensive care coordination which involves increasing communication across all providers of care (Lindeblad, 2013). Ultimately health homes are designed to replace episodic care with coordinated, comprehensive care.

Care Coordination in Health Homes

Health homes are comprised of teams of health professionals from a variety of backgrounds with various skills that can be of assistance in empowering individuals with unique needs. Findings that indicated the success of high-touch interdisciplinary teams, accessibility, partnerships, and patient-centered care models helped shaped expectations for NYS health homes (Center for Healthcare Strategies, 2012). Health homes seek to address the needs of participants based on the aforementioned components. To increase accessibility to services, health home staff identifies resources that are relevant to each individual, considering preferred geographic location, insurance participation, and even language and cultural preference. Often, health homes even provide access to a care manager who is on-call available 24 hours a day, 7 days a week.

Eligibility and Responsibility of Health Home Participants

Eligibility. In New York State, individuals' designation to a health home is established based on an assignment algorithm that takes into account geographic location and service utilization (New York State Department of Health, 2012). Each county in New York State has a designated health home, with each health home receiving referrals from the state. Although these referrals are based on area of last known residence, individuals living outside a county can be eligible for services due to service utilization. For example, an examination of claims data can be used to identify where the majority of services are located, qualifying the individual for health home services outside their county of residence. Removing strict geographical restrictions allows health homes to help participants identify appropriate resources that are most relevant to them. Diagnostic eligibility for health home participation as outlined in Section 2703 of HR 3950 describes criteria for health home participation as at least 2 chronic conditions, one chronic condition and be at risk for a second, or one serious and persistent mental health condition (pg. 203; Miller & Stanley, 2015). The vast majority of existing participants have either two chronic medical conditions or a severe and persistent mental illness. As mentioned in an earlier section, individuals with mental health conditions are specifically named as a primary target population for health home participation.

Care Central criteria. In addition to the aforementioned criteria for health home participation, it is important to note that Care Central is a health home that serves adults.

Eligibility criteria further specifies that participants must be at least 18 years of age or older. There are future plans to extend care management services to children as a clearinghouse; however, there is no indication that Care Central will directly provide care coordination to minors.

Participant responsibility. Eligible individuals who participate in the health home are expected to play an active, central role in their care (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). This means that participants actively collaborate with their care managers to identify goals and devise meaningful and viable ways to reach those goals. Participants must help create designated goals and actively work toward their achievement with the support of their team and the guidance of their care manager. Family members and caregivers should also be directly involved in the plan to provide further support to the individual participant. Goals of participants may not always initially mime the goals the care manager has; however, through communication and collaboration meaningful steps towards empowerment and self-management can be achieved.

Care Central's expectations of engagement. Participants in Care Central's health home have signed written consents demonstrating that they are aware that there are requirements in order for them to obtain and maintain the support they will receive from the program. Participants are expected to attend scheduled appointments, be honest, and make an effort to work with their care manager to increase self-management. Honesty in areas of medication adherence, medical and social history, and drug use are expected; however, it is accepted that a certain degree of rapport may be needed to elicit 'more truthful' responses from participants. If participants are found not to be making any progress towards their goals and are not involved in actively making improvements, they are at risk of being discharged from the program. Although discharge seems counterproductive, especially for clients who are historically non-compliant, past participants' cases can be reactivated if a desire to re-engage and participate in progress is demonstrated.

The Role of Care Managers

Past research suggests that community health teams can lead to effective connectivity with medical, social, and behavioral services and improvements in clinical utilization and quality (Bielaszka-DuVernay, 2011). Care managers and community health workers (CHWs) are key health home staff that works to ensure that health home participants receive the support they need. Motivational interviewing is used by care managers to coach individuals to prevent chronic health conditions from reaching a crisis (Lindeblad, 2013). Each participant in a health home is assigned a care manager who is responsible for using motivational interviewing to create self-determined goals that are consistent with values, concerns, and self-management skills (Lindeblad, 2013). A single care management record is shared by all 'team members' to review needs and goals to plan how to best coordinate individual care (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). In order to successfully support positive behavior change, care managers elicit and acknowledge participants' perspectives while emphasizing choice and effective options while supporting intentions and actions toward change (New York Care Coordination Program, 2012).

Care managers assist participants with obtaining a better understanding of their chronic conditions and collaborate with the participant to create individualized care plans that address physical, psychological, and social needs (City of New York, 2015). Health records are shared between providers with the participants' consent in order to ensure that needs are being addressed fully while also avoiding any duplication of services (New York State Mental Health and New York State Office of Alcoholism and Substance Abuse Services, 2012). Care managers coordinate referrals, assist with transitions to providers, and contact participants regularly to ensure maintained engagement and active work towards identified goals. They may make doctor appointments, provide resources, refer to organizations, and assist with applications (City of New York, 2015; Hughes, 2013). Essentially, the care manager coordinates access to all medical and social services needed for the individual to stay healthy, self-manage health to the utmost ability, and reduce high-cost service utilization.

Care managers may play different roles according to their employing health home. Some care managers' roles are to implement care plans developed by multidisciplinary teams while other take on the role of driving and designing the care plan in addition to implementation (New York State Department of Health, 2012). The New York State Department of Health (DOH) requires that care managers have at least a high school diploma and two years of experience; health homes have flexibility in attaining the right mix of experience, education, culture and skills to effectively manage their populations (Joslyn Levy & Associates, 2014). Many health homes have opted to increase the standards set by the NYS DOH and require care managers to have bachelor or master degrees, thereby allowing for the creation of the role of community health workers (CHWs). In these cases, CHWs, typically having the minimum of a high school diploma and experience working within the community, take on the role of outreaching and enrolling potential health home participants. The role of CHWs also allows care managers to concentrate on higher acuity cases that may require specific expertise (Joslyn Levy & Associates, 2014). Care managers and CHWs at times may have overlapping roles, where collaboration and flexibility is necessary to ensure comprehensive care coordination to meet all of the participants' needs.

Throughout participation in Care Central, there are times when it is necessary to transfer patients to new care managers. Original assignment of cases is to be determined by a team lead (typically a nurse); however, changes in patient need may require new expertise in an area other than what was primarily of concern when originally assigned. It is also possible that patients are discharged from the program if all needs have been met or if they are non-compliant. As previously mentioned, it is required that all agents are active participants in their care in order to receive and maintain Care Central support. Patients can opt out of services at any time, or even revoke consent to speak with specific individuals or organizations. There is no timeframe or restriction on the amount of times an individual can be engaged in Care Central. Also, individuals who been participants in the past and reengage in services if deemed appropriate.

Health Homes and the Mental Health Population

Section 2703 of the PPACA specifically identifies mental health conditions as one of the primary target populations for health homes. One of the three main criteria for health home eligibility is a severe and persistent mental condition (New York State, 2012). Furthermore, another criterion is that participants must have one chronic condition and be at risk for a second. This section further goes on to define what is meant by chronic condition, with the first example being “a mental health condition”. Through its frequent mention of mental health conditions, Section 2703 indicates the importance of the inclusion of individuals with mental diseases into health home services as a group that may specifically benefit from inclusion in comprehensive care management. According to Unutzer, Harbin, Schoenbaum, and Druss (2013) that individuals with severe and persistent mental health conditions have limited access to medical care and high mortality rates, indicating the need for stronger connections.

Mental Health in Schenectady County

According to a 2013 community needs assessment for Schenectady County, mental health was named as a significant community health need (Schenectady Coalition for a Healthy Community, 2013). A past community health profile in 2009 similarly identified mental health as an area that would benefit from further intervention; the 2013 assessment still emphasized the ever-growing need for further service coordination and additional support (Healthy Capital District Initiative, 2009). Based on a 2013 survey of Schenectady County residents, nearly a quarter of respondents had been diagnosed with depression and a third of those diagnosed were not currently receiving any treatment or taking medication (Schenectady Coalition for a Healthy Community, 2013). Although depression is one of many mental conditions affecting Schenectady County's populations, data indicates existing need and a call for improvement. Current efforts in Schenectady County include a Mental Health Taskforce that meets quarterly to share struggles and develop strategies for a more effective mental health system (Schenectady Coalition for a Healthy Community, 2013).

Existing resources. As the need for mental health services continues to increase in Schenectady County, the development of relationships with existing resources is imperative to health home success. Currently in Schenectady County there are specific agencies that work to assist individuals with mental health conditions. Catholic Charities is an organization that provides programs and services for Schenectady County through case management and disability services and the provision of transportation, housing support, linguistic services, needle exchanges, adult day programs, counseling, nutrition programs, mentoring, maternity services, and subsidized housing (Catholic Charities of the Diocese of Albany, 2015). Rehabilitation Support Services (RSS) is another organization within Schenectady County, specifically focusing on individuals with severe psychiatric disabilities and substance abuse disorders; services include residential group homes, supportive transitional apartments, care coordination, supported employment, and treatment and socialization opportunities (Rehabilitation Support Services, Inc., 2015). Alliance for Positive Health serves Northeastern New York and provides case management to individuals with HIV/AIDS and/or chronic diseases; programs include housing support, health insurance access, nutrition, mental health coordination, LGBT advocacy, transportation, syringe exchange, transitional services for formally incarcerated individuals and social media initiatives (Alliance for Positive Health, 2015). Mohawk Opportunities is an agency that focuses on the mentally ill, HIV/AIDS and homeless populations; providing supportive housing, case management, substance abuse treatment, counseling, and money management among other programs (Mohawk Opportunities, Inc., 2012). Ellis Medicine also provides a Mental Health Clinic that provides outpatient services including intensive case management, individual and group counseling sessions, and Personalized Recovery Oriented Services (PROS). Despite the existing efforts by numerous organizations to support various needs of the mental health population, needs assessments indicate opportunities for continuous improvement (Schenectady Coalition for a Healthy Community, 2013; Healthy Capital District Initiative, 2009).

Care Central's Role in Service Provision

Care Central is a health home in Schenectady County that has been designed to help patients navigate the health care system. Participants in Care Central may be homeless, unemployed, chronically physically or mentally ill, and/or substance abusers. Service coordination occurs across settings and providers to meet the needs of patients whether within the home, or in an outpatient or office setting. Care Central's office is located on the McClellan Street campus of Ellis Medicine. This location is accessible by bus and is part of a larger campus that includes primary care, dental, and physical therapy offices, a nursing home, radiology department, and a nursing school. Care Central's office location is located adjacent to a former Emergency Department; patients can stop by the office to meet with their care manager, obtain resources, or refer themselves or others to the program. In addition to its main office location, Care Central has embedded care managers and community health workers that are located on the main hospital campus on Nott Street in Schenectady where the only remaining ER in the county is located. Community organizations and medical practices such as Bethesda House and Capital Care also have embedded care managers at designated times. Care Central is continuing to work with other community organizations and practices to further expand their capabilities to connect with eligible and enrolled health home participants.

The Emergency Room and the Mental Health Population

The ER is often used as the single access point for mental health care by patients, providers, caregivers, law enforcement agencies, and other organizations (Clarke, Usick, Sanderson, Giles-Smith, & Baker, 2014). There is a national shortage in mental health beds, leading to increased ER wait times and patient exacerbation (Jones-Berry, 2014; Nicks & Manthey, 2012). ER staff does not have any standardized training requirements in order to interact with this population.

The ER plays an integral role in ensuring the patient's and community's safety by accurately assessing psychiatric patients and making the appropriate determination to admit or discharge them. For example, emergency room usage can be an important tool in predicting future behaviors for individuals attempting suicide. Internationally, research indicates that for every completed suicide, there are 8-22 ER visits for suicidal behavior; this demonstrates the opportunity for identification and intervention in this environment (Pavarin et al., 2014). Additionally, relying on emergency rooms to effectively triage, assess, and essentially treat the needs of a behavioral health patient presents risks to staff who may not be aware of patients' history or inclination to violence (Jones-Berry, 2014).

Further complicating care in the ER is a lack of standardization for how emergency departments should treat mental health patients, leading to confusion and distracting from focusing on implementation of best practices (Jones-Berry, 2014). There is ongoing debate regarding how to appropriately meet the needs of individuals with mental health conditions who are in need of a safe place. Often police departments 'deliver' psychiatric patients to emergency rooms for assessment; however, it has been argued that a busy setting containing patients in pain and distress is not the best environment for individuals in need of assessment (Jones-Berry, 2014). The ER is a suboptimal location for agitated or depressed patients; the often chaotic and lengthy waiting times can lead to escalation that requires potentially avoidable intervention (Chakravarthy, Menchine, Thompson, Rajeev, & Santos, 2013).

Interventions

Interventions on a variety of levels across countries and providers have been initiated to support individuals with mental health conditions in obtaining appropriate care. In Australia, a study was conducted to evaluate the effectiveness of an emergency room-based mental health nurse practitioner in supporting emergency room staff with this population (Wand et al., 2012). Results indicated that the intervention provided therapeutic benefits, increased self-efficacy and patient satisfaction, and decreased psychological distress (Wand et al., 2012). Another intervention that has been implemented in the ER is a family-based crisis intervention program to stabilize adolescent psychiatric patients to return home safely, preventing an admission (Wharff, Ginnis, & Ross, 2012). Using this approach demonstrated the ability to successfully discharge the overwhelming majority of participating patients by utilizing therapy as opposed to simply assessing and determining disposition (Wharff et al., 2012).

Research has also been performed to examine how follow-up contact can impact the behavioral health population that presents to the ER. In a 2013 study, differing interventions following ER and inpatient discharge were examined, demonstrating that post-discharge contact to patients with mental health conditions can reduce suicidal behavior (Luxton, June, & Comtois). Additionally, a study of a transitional, home-based care coordination following hospital admission demonstrated a significant in concurrent ER visits and admission (Lian Leng et al., 2015). Also there have been ongoing efforts to incorporate psychiatric support in outpatient provider offices. For example, the Veterans 'Administration has specifically has initiated a primary care-mental health integration program (Pomerantz & Sayers, 2010). As more programs emerge, more opportunities will become present to have a significant impact on service utilization and quality of care for individuals with mental health conditions.

Care Central and ER utilization. As a health home, Care Central focuses on increasing self-management of participants to discourage inappropriate high-cost service utilization. Motivational interviewing allows care managers to strengthen participants' willingness to change through self-identified methods. Care managers not only meet with patients to create relevant, meaningful, and achievable goals, but also to develop realistic care plans and crisis plans that can be used in times of escalation. Ideally, implementation of these service plans can prevent ER utilization and provide reassurance through specific, self-created ideas for coping and management.

In addition to care management services, Care Central attempts to prevent frequent ER utilization by embedding staff to meet with participants in that specific setting. Embedded staff will notify assigned care managers when their participants are present in the ER and request next-day follow-up. As previously mentioned, research has shown the follow-up contact can impact return visits (Luxton, June, & Comtois; Lian Leng et al., 2015). Following an ER visit, assigned care managers touch base with participants to ensure they are able to get the scripts they were discharged with, have a follow-up appointment with a doctor, and have means to get to their follow-up appointment. The embedded care manager and community health worker within the ER setting will meet with participants, discuss their presence, identify barriers that may have prevented outpatient service utilization, and/or confirm what follow-up would be necessary to increase self-management practices. All information obtained from the participant in the ER were documented and communicated to the assigned care manager and appropriate providers.

In the ER, embedded health home staff also has an opportunity to meet with potential and enrolled health home participants who are there primarily for mental health reasons. The embedded care manager and community health worker not only meet with current health home participants, but also outreach individuals who may be appropriate for care management services based on health home criteria, specifically including individuals with mental health conditions who may be present in the ER. Although embedded staff may receive a referral from a provider, they confirm appropriateness of contact with a patient and oftentimes request follow-up when the patient is stabilized and/or following discharge. Ongoing communication is necessary to ensure that plans are in place to support both those enrolled participants who present to the ER, as well as those who should be considered for further outreach.

Health Homes' Effect on Healthcare Spending and Self-Management Practices

Early Success and the Call for Further Evaluation

Examining current health home implementation across the country provides interesting insight into the range of policies, procedures, and general methods of engagement used to accomplish the intended purpose. In Vermont, a health home program called the Vermont Blueprint for Health has been created, using health teams to provide and coordinate multidisciplinary care to meet patients' needs (Bielaszka-DuVernay, 2011). Initial analysis of annual comparisons demonstrates a decrease in emergency usage and hospital admissions, with a projected savings of 28.7% by its fifth year of operation. (Bielaszka-DuVernay, 2011). Other programs have shown similar successes in reducing high-cost utilization. Oregon has incorporated health homes into what is called a 'patient-centered primary care home program'. This program adds a per member per month (PMPM) payment to existing services that function as a patient-centered medical home (PCMH) (Spillman, Ormond, Richardson, & Chelak, 2012). Analysis of one of Oregon's programs called CareOregon demonstrated a cost savings of

$89 per month, with approximately two-thirds of savings being attributed to reduction in inpatient hospital utilization (Kaye & Townley, 2013).

Furthermore, Oklahoma has also embraced health home implementation. SoonerCare health homes use interdisciplinary teams to create unified plans to coordinate individual health needs and empower self-management (SoonerCare health homes, 2015). According to a 2011 report, Oklahoma Medicaid had a reduction of costs per enrollee by $29 annually (Kaye & Townley, 2013). Across the country and within numerous and various populations, initial analyses of savings indicate the promise of success that health homes are demonstrating in saving money through the provision of more comprehensive, patient-centered care.

Need for analysis for Care Central

Research indicates that early-stage evaluation can provide valuable recommendations and increased perceived ownership, leading to better participant outcomes (Gilmore, Vallieres, McAuliffe, Tumwesigye, & Muyambi, 2014). Care Central specifically, has not undergone any evaluation regarding its impact on ER visits for its behavioral health population. Early analysis of Care Central's companion medical home has shown a favorable impact on outpatient service utilization, leading to predictions of Care Central's success (American Hospital Association, 2013). One of the main reasons that Care Central has not been evaluated can be attributed to New York State's permission for loose interpretation of policies and procedures, leading to an ever-evolving structure, complicating evaluation. Care Central, being one of New York State's first health homes, is constantly undergoing changes to maintain community relevance and provide necessary service coordination based on the needs identified by the target population. Also, since its' foundation, Care Central has had three directors, numerous staff, and continues to grow in location and expertise. As Care Central evolves and solidifies many of its policies and procedures, evaluation is necessary to ensuring that practices are aligning with desired outcomes.

Summary

This chapter presented a review of literature on the Patient Protection and Affordable Care Act (PPACA), health homes, NYS implementation of health homes, Schenectady County, and Care Central. The literature review performed illustrated how and why health homes were established, the variability of implementation and practice, and the current functioning of Schenectady County's health home Care Central. The HBM was described for the role it plays in the overall scheme of health homes and how it can contribute to a better understanding of the intentions of this study and analysis of results. Since the establishment of health homes is relatively new, literature relating specifically to the effect of participation on participants with mental conditions is relatively scarce. Additionally, Care Central is lacking in outcome data, especially data regarding emergency room utilization among enrolled behavioral health participants. Chapter 3 will discuss research methodology, including data collection and analysis. Setting and sample will be detailed. Internal and external threats to validity will be identified.

Chapter 3: Research Method

Introduction

The purpose of this non-experimental, longitudinal, retrospective, cohort study was to examine the relationship between the mental health population's participation in Schenectady County's health home, Care Central, and its ER utilization. I chose a longitudinal, retrospective approach to provide a comprehensive view of any association between participation in Care Central and ER usage, while also allowing for the identification of existing trends in order to remove their potential effect on the interpretation of results. This chapter includes an overview of the research design and rationale that I used to address the research questions concerning the effects of health home participation on ER utilization for Care Central participants with mental health conditions. In a discussion of population selection and sampling procedures, I explain the population being represented and how the sample was obtained. When outlining the data analysis plan, I describe how each research question was addressed using specific variables and quantitative analyses performed using IBM SPSS Statistics version 21.0. Threats to internal, external, and construct validity show the potential for certain variables and circumstances to influence the study. Finally, I explain ethical issues and the methods I used to preserve integrity. Overall, the information regarding the existence of an association between Care Central enrollment and ER utilization for participants with mental health conditions resulting from this study is useful in guiding practice and future research.

Research Design and Rationale

Study Variables

In this study, I used a cohort research design employing quantitative, longitudinal, retrospective data. Using the independent variable of health home participation, I retrospectively examined the cohort of participants with mental health conditions over a 24-month period of time (12 months prior and 12 months following enrollment in Care Central). The number of the sample's ER visits were individually gathered at predefined points prior to and throughout their enrollment in the health home, to indicate if a potential relationship between participation and service utilization existed. In this study, the dependent variable is the ER usage of participants with mental health conditions who have been enrolled Care Central for 12-month period. I analytically explored age, gender, and race to identify their potential role as moderating variables; past research has indicated the effect that race, age, and gender can have on predisposition to mental health conditions as well as ER utilization (Bertakis et al., 2000; Nawka et al., 2013; Brugha et al., 2013; Chang et al., 2011; Dagher et al., 2015).

Design

I used a nonexperimental design to address the research questions. According to Shadish, Cook, & Campbell (2002), studying variables that cannot be manipulated may help identify variables that can be manipulated in order to use that knowledge to remedy the problem at hand. In this study, ER utilization of Care Central participants with mental health conditions could not be manipulated (due to the retrospective design); however, the knowledge gained from this research can be used to decrease future usage as intended by health homes. As with this study, past research has used nonexperimental designs to explore research questions guided by the conceptual framework of the HBM and to examine behaviors of individuals with mental health conditions (Oliver, Grindel, DeCoster, & Martin, 2011; Simpson & Carter, 2013; Pepin & King, 2013). I used inferential statistics to explore the potential existence of a relationship between health home participation and ER utilization for participants with mental health conditions, controlling for confounding variables of age, gender, and race. Resource and time constraints reinforced the appropriateness of the design; consistent with the amount and scope of data to be collected, the coverage of the informed consent signed by participants, and the right to participants' receipt of the intended program, I used a nonexperimental design. Due to the longitudinal and retrospective nature of the study, I needed to designate a specific point in time in order to have a comparable look-back period for which to measure ER utilization for participants with a mental health diagnosis enrolled in Care Central. My use of a nonexperimental strategy was intended to establish a baseline of knowledge on this topic, which has been previously unexplored.

Methodology

Population

The population from which I extracted a statistically representative sample was clients diagnosed with a mental health condition who had been enrolled in Care Central for at least 12 consecutive months. In addition, all participants included in the study have had a documented history in Soarian Clinicals to confirm that they were not completely new to the area, therefore inaccurately representing change in service utilization. I identified eligible study participants, and ran a patient report in Care Team Connect to obtain the total eligible population. All participants resided in Schenectady County and were at least 18 years of age. Each member of the population had a minimum of one mental health diagnosis and may or may not have had accompanying chronic medical conditions. Individuals in the population had been assigned to a care manager to work with them on goals that progress that participant to a higher level of self-management of their condition(s). Some participants may have been working with their care manager for a number of years, while others may have only been working with the health home or their individual care manager for the minimum period of 12 consecutive months. All members of the population have had the opportunity to opt out or re-enroll in services with Care Central as appropriate.

Sampling and Sampling Procedures

I used a systematic random sampling technique to select eligible participants. Systematic random sampling has been used in pilot studies, as well as by researchers who have sought to describe the impact on ER utilization and progress among individuals with mental health conditions (Zandee, Bossenbroek, Slager, & Gordon, 2013; Scorzelli & Chaudhry, 2009). Using the population of N=265 participants with mental health conditions, I conducted a power analysis to determine the sample size. The total population (N) was divided by the desired sample size of n=158, producing a value of 1.77; since 1.77 is not an appropriate interval, I selected an arbitrary number of 5. Using the total eligible population of individuals with mental health conditions currently enrolled in Care Central, I chose a starting number and interval less than the total population. The starting number I used in this study was 8, and the interval was 5. Persons within the population were listed in alphabetical order and the sample was selected starting from the 8th individual, choosing every 5th member of the population to obtain the necessary sample of 158 participants. The following sections will detail the inclusion and exclusion criteria, as well as the power analysis.

Inclusion and exclusion criteria. I did not include all individuals enrolled in Schenectady County's health home that have a mental health diagnosis in the sample. Sample participants had to have been enrolled in Care Central for a minimum of a consecutive 12-month period and have documented medical histories with Ellis Medicine prior to health home enrollment. Exclusion of the aforementioned participants was based on the likelihood that those individuals were completely new to Schenectady County or the surrounding areas; inclusion of these participants would have misrepresented the demonstrated change in service utilization, skewing results. I used data cleaning to remove individuals from the sample who lacked history in the Soarian Clinical system. Another delimitation of this research was the restriction of the study of ER utilization to Schenectady County, potentially ignoring any usage of enrolled participants in outside counties. Appropriate delimitations and exclusion criteria strengthen the likelihood that the most accurate sample possible was obtained in order to be representative of the true population and effect.

Care Team Connect, the database that logs all individuals' contact with Care Central, was used to access the relevant population from which to draw the sample. Individuals loaded into Care Team Connect can be past, current, or future participants—

essentially any person that the health home has come in contact with or attempted contact with in any setting (office, home community, hospital) is contained in this database. The engagement status of individuals logged in Care Team Connect differs; they may be enrolled, have opted out, or lost contact with the health home. Similarly, all participants in Care Team Connect do not have a mental health diagnosis; they may qualify based on chronic medical issues or completely lack diagnoses if in "outreach" status. For the purpose of this study, a patient report extracted only individuals who had mental health conditions, and who were currently still enrolled in the health home at the time the report was performed.

Power analysis. I used G*Power version 3.1.9 software to calculate the power analysis and determine the optimal sample size. According to Dickinson, Adelson, and Owen (2012), and Faul, Erdfelder, Albert-Georg Lang, and Buchner (2007), G*Power is an adequate tool to appropriately calculate the correct sample size; this has been supported by its wide use in a number of studies (Faul, Erdfelder, Buchner, & Lang, 2009; Lu & Askin, 2014). Ribeiro, Campos, Baptista, and Sousa (2010) have used G*Power to calculate sample size while studying Valsalva maneuever in Chagas disease patients; O'Connell, Kneale, Tasevska, and Kuhnle (2012) have used this in examining the paleo-diet; Al-Daghri et al. (2012) in a study on vitamin D and metabolic syndrome; and Alexander, Chen, Pietrini, Rapoport, and Reiman (2002) used G*Power when calculating the sample size for research tracking the rate of cerebral decline in Alzheimer's patients.

I performed a *t* test and an ANCOVA with the raw data; the statistical tests using in analysis drive the power analysis. The type of power analysis chosen within G*Power is “a priori: computer required sample size – given α, power, and effect size” and the test family chosen was “*t* test.” Since I used matched pairs to compare means, the statistical test category chosen was “means: difference between two dependent means (matched pairs).” Within the input parameters, the test was identified as a two-tailed test, due to the non-directional, null hypotheses.

I identified the effect size as 0.5, which is a moderate effect size and has been used in studies involving co-occurring health-related behaviors, psychological outcomes in dementia caregivers, and quality of life in radiation oncology (Dusseldorp et al., 2014; Irwin, 2013; Tavernier, Beck, Clayton, Pett, & Berry, 2011). The alpha level was .05, as is the standard for behavioral science analyses such as studies involving attitudes toward a recovery-oriented psychiatric ward, quality of life and physical functioning of HIV/AIDS patients, and fear of falling among the elderly (Akosile, et al., 2014; Mbada, Onayemi, Ogunmoyole, Johnson, & Akosile, 2013; Rabenschlag, Konrad, Rueegg, & Jaeger, 2014). The power level was 0.95, which means that if there was really an effect, there was a 95% chance of detecting that in this study. This power level has been used in research on weight maintenance programs, body mass index in Latina girls, and effects of cannabis use on heroin abstinence (Elder et al., 2007; Limbers, Kantor, & Grimes, 2015; Epstein & Preston, 2003).

After clicking on “calculate” in G*Power 3.1.9 software, two graphs were produced: the red graph demonstrated the known distribution, and the dotted-blue graph demonstrated the research hypothesis. Within the output parameters, total sample size necessary was determined to be *n*=158. This means that in a within-subjects situation when comparing two dependent means, 158 individuals were needed to have a sufficient sample size that would be appropriate for the analyses. To ensure an adequate sample size was ultimately obtained, I gathered data for 163 individuals to account for those initially identified that may require exclusion due to lack of history within the Ellis Medicine system prior to enrollment in the health home.

Procedures for Recruitment, Participation, and Data Collection

Recruitment and participation. The ER utilization data was gathered from the two ERs associated with Ellis Medicine, which are physically located in Schenectady County. The vast majority of Care Central clients reside in Schenectady County; however, health home enrollment is based on geography or service utilization. This means that an individual can be enrolled in Care Central and living in another county if the majority of their services are obtained within Schenectady County. All visits to Ellis Medicine's ERs are documented in the Soarian Clinicals database, providing information on the reason for the visit and associated diagnoses, among other information. Data regarding pertinent ER utilization involving a mental health diagnosis was obtained and tallied for each participant in the sample; all information was gathered using Soarian Clinicals, and was collected by the researcher and attributed to the corresponding participant.

Active recruiting of participants was not necessary for this research; however, the permission of Ellis Medicine had to be secured in order to access the secondary data necessary to execute the proposed study. Demographic information of gender, age, and race was obtained to use as a source of information regarding the presence and effect of moderating variables. All of the demographic information was provided to the researcher using a patient report generated using Care Team Connect and confirmed using Soarian Clinicals.

Informed consent. Explicit informed consent for study participation was not required due to the study serving as a pilot program evaluation. In cases where members of the cohort sought ER assessment and treatment at an unaffiliated organization, information regarding that visit was not accessible; this was not overtly threatening to the study since Schenectady is a small, urban county served solely by Ellis Medicine for emergency services. Although health home participants signed the DOH-5055 which enables care managers to access Hixny, it is not a reliable source for all visits. Hixny is a regional health information organization (RHIO) that enables the exchange of health information among various healthcare providers and networks (Hixny, 2015). Even if the study accessed Hixny to capture a larger area of ER utilization, this system is not always up-to-date and serves the Capital Region and Northern New York State, again missing the information from some of the numerous Schenectady residents who have relocated from New York City (Schenectady Coalition for a Healthy Community, 2013). All eligible participants had initially signed the DOH 5055 consents for information release upon enrollment in Schenectady County's health home. These consents give permission for care managers to access appropriate information from Ellis Medicine's system and Hinxy; other providers and agencies can be separately listed. For the purposes of this study, Ellis Medicine served as the sole source of information regarding participants' visits to ERs.

All eligible participants enrolled in the health home had received the 'intervention', informed consent for study participation was not required. Lack of consent has been acceptable in past research with a Medicare Health Support population where it is not necessary to obtain consent from a control population (King, Nielsen, Coberley, Pope, & Wells, 2011). According to the Federal Policy for the Protection of Human Subjects, research activities to which the policy does not apply: is research involving the collection or study of existing data, documents, or records, if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects; or if research conducted by or subject to the approval of department or agency administration, and which are designed to study, evaluate, or otherwise examine: public benefit or service programs; procedures for obtaining benefits or services under those programs; possible changes in or alternatives to those programs or procedures (*Federal* Policy for the *Protection of Human Subjects, 2009*). This study met the requirements for federal exemption as it met the aforementioned criteria.

Data collection. Data was collected in the absence of any specific instrument. Each time any individual presented to any one of Ellis Medicine's ERs, the information from their visit, including triage information, lab results, radiology, and provider documentation were logged in the Soarian Clinicals database. Soarian Clinicals is a healthcare information system that organizes and stores documentation of clinical data across departments and care settings (Cerner Corporation, 2015). Doctors, nurses, and support staff can enter information such as triage account, medical history, medical interventions, notes, and current medications. Soarian Clinicals enables orders to be placed for radiology and procedures and electronic referrals for follow-up care or further intervention can be requested as this system interfaces with numerous departments. This database contains all of a patient's encounters with Ellis Medicine, which includes ER visits. Only information regarding the number of ER visits and diagnosis information was used for the purposes of this study; however, the other services are important to note as they pertain to the aforementioned purpose of exclusion from the sample. Once a patient was identified as having an ER visit, a drop-down box lists each visit. The code of 'EOP' designated an Emergency Outpatient visit; each EOP visit was designated chronologically, with diagnoses related to the visit listed directly beneath. For each ER encounter, numerous diagnoses pertaining to that visit were identified; visits for participants coded with a mental health diagnosis were the source of the information on ER utilization for the study.

An additional source of information for the study was Care Team Connect, which is the system used to contain all information pertinent to the care management services or outreach attempts made by the health home or any of its care management agencies. For each participant, basic information and contact information was documented; this information could be routinely updated on an as-needed basis. Additionally, individuals who were enrolled in health home services would have had demographic information, diagnoses, providers, medications, clinical notes, and documentation from any form of contact with health home staff stored within Care Team Connect. Importantly, each enrolled participant had goals that were collaboratively set that demonstrated the need for their continued support from the health home, with progress notes marking achievement or lack of achievement toward that goal. This system was used to obtain the population and ensure that chosen participants had been actively enrolled in the health home for a minimum continuous timespan of 12 months, all of which was accounted for in Care Team Connect.

Information that was used to address the research questions was obtained from the two databases previously discussed: Care Team Connect and Soarian Clinicals. The population and sample of health home participants were determined using Care Team Connect and ER visits were calculated using Soarian Clinicals. To obtain eligible participants, the researcher ran a ‘patient report’ in Care Team Connect. Results were produced in a Microsoft Excel spreadsheet. The spreadsheet produced was sorted and manipulated to provide general information, before data was loaded into IBM SPSS Statistics version 21.0. ER visits coded with a mental health diagnosis were included in the study. All names were removed from the sample, with sequential numbers used as identifiers, to protect privacy in the analysis phase. Since the study was retrospective and longitudinal, there were no debriefing procedures or opt-out forms for the sample; also, follow-up treatments and interviews were unnecessary. Following final approval of the study, information will be presented to management, with results being available to both Ellis Medicine and Care Central.

IRB approval had been obtained from Ellis Medicine's IRB, after presentation of the proposed study (under approval number 04-08-16-0325556). Since participants in the health home had consented to participate in the program and no identifying information was used within the study, individual consent was not required as the research evaluated the program itself and met federal qualifications for exemption. Due to IRB approval received from Ellis Medicine, the researcher had authorization to run a patient report in Soarian Clinicals and Care Team Connect to extract the necessary information. A copy of permission has been attached in the appendices. The patient report generated was refined to participants who meet the eligibility criteria of a mental health diagnosis; minimum participation had to be accounted for manually due to database limitations. Following the procurement of the patient report, the data set was translated into a Microsoft Excel spreadsheet and later loaded to IBM SPSS Statistics version 21.0 for analysis after the aforementioned data cleaning was performed.

Data Analysis Plan

IBM SPSS Statistics version 21.0 was the software that was used for data analysis. Access to Soarian Clinicals and Care Team Connect required individual passwords; after necessary was added to the spreadsheet, there was no need to continue to access these systems for the study. Descriptive statistics, with numeric and graphical representations of data, was performed to analyze frequency of socio-demographic variables. Central tendencies measures such as median, mode, and mean were calculated. From frequency distributions, a pie chart was used to display the variable of gender; and race was displayed using a bar graph. Also represented was measures of the spread such as range of age of the sample. Research questions were addressed as illustrated in Table 2.

Table 2

Analysis Design by Research Question

RQ1: Is there a reduction in average ER utilization rates among mental health clients enrolled in Care Central when comparing average ER visitation rates one year prior to and following enrollment in the program?	Independent variable: Participation in Care Central Dependent variable: ER utilization	Statistical test: One-way, repeated measures *t*-test
RQ2: Is there a reduction in average ER utilization rates of mental health clients enrolled in Schenectady County's health home at their three, six, and nine, and twelve month anniversaries, while controlling for age, race, and gender?	Independent variable: Anniversary since enrollment (0, 3, 6, 9, and 12 months) Dependent variable: ER utilization Moderating variables: Age, race, gender	Statistical test: One-way, repeated measures ANCOVA

RQ1: Is there a reduction in average ER utilization rates among mental health clients enrolled in Care Central when comparing average ER visitation rates one year prior to and following enrollment in the program?

> Ho1: Mental health clients' participation in Care Central will not reduce emergency room utilization rates when comparing average ER visits one year prior to and following enrollment in the program.

Ha1: Mental health clients' participation in Care Central will reduce emergency room utilization rates when comparing average ER visits one year prior to and following enrollment in the program.

ER usage was obtained from Soarian Clinicals; the dataset used for this test included the total number of visits 12 months prior to the date of health home enrollment and the total number of ER visits in the 12-month period following the date of health home enrollment. To address the first research question, a one-way, repeated measures *t*-test was performed in IBM SPSS Statistics version 21.0 to compare ER utilization before and after enrollment in Care Central. The mean ER visits prior to health home enrollment and the mean ER visits following health home enrollment were identified as the two paired variables.

Assumptions for the repeated measures *t*-test were verified to ensure appropriate representation of data. The dependent variable of ER utilization met the requirement of being measured at the continuous level and the independent variable met criteria of being categorical and in related groups. No significant outliers were initially assumed, which was verified in the analysis using IBM SPSS Statistics version 21.0. Also the assumption of approximate normal distribution was tested using the Shapiro-Wilk test of normalcy.

After performing a one-way, repeated measures *t*-test using IBM SPSS Statistics version 21.0, a paired samples statistics table and a paired samples test table was generated. As previously mentioned, confidence interval was 95%, the level of significance, α,.05, and p-value .05 for results to be considered statistically significant. The p-value was compared to the level of significance (or alpha). If the p-value was equal to or less than alpha, the null hypothesis was rejected. If the p-value was greater than alpha, then the researcher would have failed to reject the null hypothesis, which means that there was insufficient evidence to reject the null.

RQ2: Is there a reduction in average ER utilization rates of mental health clients enrolled in Schenectady County's health home at their three, six, and nine, and twelve month anniversaries, while controlling for age, race, and gender?

Ho2: There is no reduction in average ER utilization rates for Care Central participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

Ha2: There is a reduction in average ER utilization rates for Care Central participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

The second research question was answered using one-way, repeated measures ANCOVA to illustrate an analysis of ER utilization following participants' enrollment in Schenectady County's health home based on anniversary date, while controlling for moderating variables. The independent variable in this analysis was length of health home participation and the dependent variable was ER utilization. Age, race, and gender were identified as moderating variables based on past research; in order to account for their potential impact on the relationship between the independent and dependent variables they were controlled for in this study (Bertakis et al., 2000; Nawka et al., 2013; Brugha et al., 2013; Chang et al., 2011; Dagher et al., 2015).

Assumptions for the one-way repeated measures ANCOVA were verified to ensure appropriate representation of data. The dependent variable of ER utilization met the requirement of being measured at the continuous level, covariates were assigned numeric values, and the independent variable met criteria of being categorical and in related groups. No significant outliers were initially assumed, which were verified in the analysis using IBM SPSS Statistics version 21.0. Also the assumption of approximate normal distribution was confirmed using the Shapiro-Wilk test of normalcy. Homoscedasticity, or the linear relationship between outcome and covariate, was tested through the creation and examination of a scatter plot. The assumption of homogeneity of regression slopes was verified using a custom ANCOVA table.

Using a one-way, repeated-measures ANCOVA, mean ER utilization based on anniversary date was compared. This further explained the first research question, helping identify, for example, whether an overall reduction is gradual or sharp, when controlling for age, race, and gender. A univariate general linear model analysis was performed in IBM SPSS Statistics version 21.0. The dependent, independent, and moderating variables were identified, and a full factorial analysis performed. A Bonferroni confidence interval adjustment was identified and descriptive statistics, estimates of effect size, and homogeneity tests performed. Following analysis, a descriptive statistics table, tests of between-subjects effects table, an estimates table, a pairwise comparison table displayed results. The tests of between-subjects effects table demonstrated whether the ANCOVA is statistically significant; whether there was a difference in mean ER utilization between anniversary dates after the means had been adjusted to account for the moderating variables (age, race, and gender). The pairwise comparisons table identified where the differences between the adjusted means lay, if there was a known statistically significant difference. Confidence interval was 95% and p-value considered statistically significant at 0.05.

Threats to Validity

External validity. Threats to external validity arise when researchers make inaccurate inferences from the sample to other people, settings, and past or future situations (Creswell, 2009). In order to address threats to external validity, no generalizations were made outside of the selected population. The results of this study were limited to generalization among Care Central participants with mental health conditions at and prior to the time data collection initiates. It is important to note that the results were not expanded to apply to the same population in the future, since practices and policies, even within Schenectady County's health home specifically, are changing constantly. Health homes also have clientele that do not have mental health conditions, qualifying solely based on chronic medical conditions; it would be inappropriate to generalize the impact of enrollment to this population as well as there can be significantly different challenges presented in engaging participants in self-management.

Interaction effects of selection biases were carefully considered and groups were randomly and systematically selected to reduce bias. The Hawthorne Effect was not of concern because there were no distinct groups where one group was aware of participation in an experiment; all participants received opportunity to make choices to increase self-management. Also since the study was retroactive and looks at a total time period of 24 months, the Hawthorne Effect was unlikely to occur (Goodloe, Crowder, Arthur, & Thomas, 2012). The interaction effect of testing did not threaten external validity because there was no pretesting administered prior to health home enrollment.

Results from the study were not generalized to participants with mental health conditions in other health homes because of the variability present in guidelines and practice. It is important to note that health home regulations and practices are constantly changing, essentially influencing the way participants are receiving the opportunity to develop their self-management skills. A form of multiple-treatment interference may be related to the way in which care managers interact with their clients. For example, if one participant receives one monthly phone call, they may not have the same 'carry-over effect' on ER utilization as a participant who has met with their care manager in person that month in addition to telephonic contact. Research has suggested that face-to-face interaction is still the most dominant and meaningful way of communication and one of the best ways to obtain more explanation from interviewees (Baym, Zhang, & Lin, 2004; Irvine, 2011).

Furthermore, the data from the sample represented the specific individuals chosen at a specific point within their individual process of developing self-management; understanding this, results were not generalized to varying time periods following enrollment. If change in ER trends, for example, occurred at the 9-month anniversary following enrollment, it may be indicative of the escalation of outreach or the point in which rapport has built to where the individual relies more on their care manager to assist with self-management than the ER to triage acute crises, which may have even been completely avoided by trust and ongoing work with their care manager. Care Central's success was not generalized to another health home, for example, where care managers have half the caseload, a higher concentration of different mental conditions than Care Central, or stricter guidelines in the frequency of home visits.

Internal validity. According to Creswell (2009), internal validity threats are experiences, treatments, or procedures that threaten the researcher's ability to make correct inferences from the data about the population being studied. Since the study had a longitudinal design, maturation posed a threat to internal validity. It is possible that there was a general increase in ER utilization during flu season regardless of enrollment in the health home; this existing trend would have been identified in order to prevent the assumption that enrollment has somehow influenced this existing pattern, indicating the need for further research after this initial study.

Selection bias occurs when the criteria used to recruit participants results in the sample not being representative of the intended population (Pannucci & Wilkins, 2010). According to Borschmann, Patterson, Poovendran, Wilson, and Weaver (2014), recruiting to mental health trials is complex and there are many barriers in adequately representing a population considered 'vulnerable'. The study was retrospective, meaning that exposure and outcome had occurred in order for the individual to qualify for inclusion. If a participant had not continuously been enrolled in the health home for 12 months, they would not have had the opportunity to be included; this lack of inclusion could lead to a misrepresentation of the general population of mental health participants enrolled in Care Central. To best address selection bias in this study, systematic random sampling was used to obtain the sample.

Construct validity. Construct validity occurs when researchers use accurate definitions and measures of variables (Creswell, 2009). Evidence of construct validity is supported by well-defined variables and multiple sources of evidence when possible. The independent variable of health home participation was defined as active and ongoing enrollment in health home activities. Construct validity was of concern as previously mentioned; practices differ between participant, care manager, and health home. One individual's participation may have been satisfied with the majority of monthly contacts being phone interactions with their care manager, while another participant's engagement may have involved monthly face-to-face meetings at appointments or within the home. The flexibility originally allowed by New York State, although advantageous in allowing health homes to designate how to appropriately assist participants, also posed a threat to the construct validity of this study. As health homes progress in age and increase standardization of policies and procedures, a more accurate definition of 'enrollment', 'engagement', and 'participation' will be provided; however, at this time loose definitions posed notable threats to the construct validity of this research.

The dependent variable of ER utilization was defined as visits to Ellis Medicine's emergency rooms (either on McClellan Street or Nott Street in Schenectady) whose visits were coded with a mental health diagnosis. Visits to emergency rooms other than those at Ellis were not included in the study, potentially allowing for pertinent ER visits being excluded. Also since health homes comprehensively address the needs of participants, it is possible that participation in the health home had also influenced participants' overall ER utilization; ER usage related to chronic medical conditions may or may not have followed similar trends when compared to utilization based solely on mental health conditions. Specification to ER visits with mental health diagnoses was necessary in order to examine how health home enrollment affects the psychiatric self-management of participants with diagnosed mental health conditions.

Ethical Procedures

Prior to data collection, IRB approval was obtained from both Walden University and Ellis Medicine (under approval number 04-08-16-0325556). There were no identifiable risks for participants and because the study was retrospective, treatment of participants was not affected by inclusion in the study. Participants were unaware of the study, as well as whether or not they would be included anonymously. Withdrawal from the study was not possible because of the inclusion criteria and retrospective design. Furthermore, care managers and those who interacted with participants on behalf of Care Central were not aware of the research conducted or which specific participants were included in the sample.

Another potential ethical issue was that the primary researcher had worked within one of the ERs whose location was used as a dependent variable. Additionally, the primary researcher had been an embedded care manager for Care Central in the past; however, the primary researcher did not manage a caseload due to embedded responsibilities. If the researcher was managing the individuals being studied, there may exist more opportunities for bias and ethical issues to arise. Results of the study are useful in the future development of Care Central regardless; no preference had been expressed concerning whether there is a desire for the results to support the alternative hypothesis over the null hypothesis, or vice versa.

Participants' anonymity was protected as individual identification was replaced with a numeric representation once an appropriate sample was selected. All individual identifying information was removed after the data was extracted from both Care Team Connect and Soarian Clinicals. All data and spreadsheets remained confidential and accessed only with a password, with no paper trail of the data left behind. A flash drive backed-up data, which again will be password-protected and void of individual identifiers. Five years following the study, all data stored within the computer and on the flash drive will be destroyed.

Summary

This chapter provided an explanation of the methodology of the study, with research questions focusing on whether or not there was a relationship between participation in ER utilization and participation in Care Central for participants with mental health conditions. A retrospective, longitudinal, cohort design was used to obtain the appropriate sample size to analyze and interpret results accurately. Additional information in this area leads to greater overall understanding of Care Central's specific impact on and relationship to ER utilization for enrolled participants with mental health conditions. In the following chapter, the results of the study will be presented, each research question addressed, and evident of quality discussed.

Chapter 4: Results

Introduction

The purpose of this quantitative, retrospective, cohort study was to examine the relationship between the participation of the Care Central population of individuals with mental health conditions and their ER utilization. With the first research question, I sought to discover if there was a reduction in the average ER utilization rates among mental health clients enrolled in Schenectady County's health home when the comparing the average ER visitation rates one year prior to enrollment to one year following enrollment in the program. The null hypothesis was that mental health clients' participation in Schenectady County's health home will not reduce ER utilization rates when comparing the average ER visitation rates one year prior to enrollment to one year following enrollment in the program. The alternative hypothesis was that mental health clients' participation in Schenectady County's health home will reduce ER utilization rates when comparing the average ER visitation rates one year prior to enrollment to one year following enrollment in the program. With the second research question, I sought to identify if there was a reduction in the average ER utilization rates of mental health clients enrolled in Schenectady County's health home at their 3, 6, and 9, and 12 month anniversaries, while controlling for age, race, and gender. The null hypothesis was that there is no reduction in the average ER utilization rates for Schenectady County's health home participants with mental health conditions at 3, 6, 9, and 12 month anniversaries following enrollment, while controlling for age, race, and gender. The alternative hypothesis was that there is a reduction in the average ER utilization rates for

Schenectady County’s health home participants with mental health conditions at 3, 6, 9, and 12 month anniversaries following enrollment, while controlling for age, race, and gender.

This chapter includes an overview of the data collection process that I used to analyze each research question regarding the effects of health home participation on ER utilization for active Care Central participants with mental health conditions. Procedures and discrepancies in the data collection plan are detailed to justify the methodology I applied to obtain the results. Descriptive statistics, demographic characteristics, and representativeness are described to provide a robust understanding of the sample that I used. The study’s statistical assumptions are addressed to determine whether the underlying requirements for the analyses performed where met. I then present results from the statistical analyses, and provide explanations using the analyses of the sample to demonstrate whether or not an association exists between Care Central enrollment and ER utilization for active participants with mental health conditions.

Data Collection

Sample Selection

The population from which I identified the sample was comprised of currently-enrolled individuals with mental health conditions who participate in Schenectady County’s health home, Care Central. All individuals in the population resided in Schenectady County and had been enrolled in Care Central for the minimum of a consecutive 12-month period. There was no specific timeframe requirement in terms of the framing of the 12-month consecutive period, meaning that at enrollment, eligibility could have initiated at any point in time since the health home began enrolling participants in 2012. Running the patient report to collect the sample in the Care Team Connect database took approximately 5 minutes to complete. Individual chart reviews to determine enrollment data and consecutive enrollment timeframe took about 1 week to complete. I collected ER utilization visit information for each member of the sample, which took approximately two weeks to complete. Response rates were not a factor of consideration since all individuals who were included in the population have signed standardized health home consent forms required by the New York State Department of Health.

Due to technical limitations identified after performing a patient report in Care Team Connect, the database which stores all information for Care Central, there were discrepancies from the plan originally outlined in Chapter 3. Of importance, all changes were approved through Walden University's Institutional Review Board (IRB) after I submitted a Request for Change in Procedures Form (approval number remained 04-08-16-0325556). Initially, I had identified the study's population as including all individuals who had been enrolled in the health home at one point, past or present, that met the criteria for inclusion. After performing the original patient report and receiving a population of over 4,100 individuals, I found that the software used to complete the report lacked the capability to confirm participants' length of enrollment. because of this limitation, I would have had to perform individual chart review of over 4,100 participants in order to determine which participants may *potentially* be included in the population. Further complicating such a large-scale chart review, information regarding enrollment date was often not listed in a specific location within the participants' charts; this required reviewing numerous of pages of notes in each case to identify the original enrollment date to determine qualification.

To account for the technical limitations of Care Team Connect, I limited the population to active (currently-enrolled) individuals who met the eligibility criteria, excluding participants who were no longer enrolled. The eligible population of participants in Care Central with mental health conditions who were actively enrolled numbered just over 400. After individual chart review was completed to confirm the criteria were met for consecutive enrollment and enrollment date, the eligible population numbered 265 individuals. Using this number, I conducted a power analysis using G*Power to determine the required sample size of 158 participants. The type of power analysis chosen was "a priori: computer required sample size – given α, power, and effect size," the test family "*t* test," and the statistical test category "means: difference between two dependent means (matched pairs)." Within the input parameters, the test was identified as a two-tailed test, the effect size identified as 0.5, the alpha level .05, and the power level 0.95. Appropriate sample size was again confirmed to be 158 using the Raosoft Sample Size Calculator. To calculate the required sample size using this method, I identified the population size as 265. A 5% margin of error, 50% response distribution, and 95% confidence level were used in the calculation; all of assumptions aligned with the most commonly used research values.

I employed a systematic random sampling technique to identify 163 participants, drawing 5 extra participants to account for any further potential exclusion after ER utilization was assigned. Any participants within the sample that completely lacked any history in the Soarian Clinical database prior to the date of enrollment were excluded from the study. Of the 265 individuals in the eligible population, starting with and including the eighth individual in the sample, every fifth member of the population was selected for inclusion until a total of 163 participants were chosen. The additional five participants were separated from the first 158 selected, to be added at a later point if deemed necessary. After researching each sample participant's ER utilization, exactly five participants were excluded due to complete lack of history in Soarian Clinicals; the additional five participants that had been previously selected were then added into the study to return the total sample size to 158 individuals.

Results

Demographics

The majority of the participants in the sample were female (59.5%; *n*=94) and White/Caucasian (64.6%; *n*=102). Other races present within the sample were Black/African American (24.1%; *n*=38), Hispanic (7.6%; *n*=12), and Asian (1.3%; *n*=2). There were four individuals with an unknown race who had refused to identify with both Care Central and Ellis Medicine (2.5%; *n*=4). The median age for the sample was 47 years old and the range 46, with a minimum age of 21 years old and a maximum age of 67 years old.

I compared the demographic composition of the sample drawn to that of the United States Census Bureau's 2014 estimates of Schenectady County. Table 3 provides a summary of the demographic data for the study sample as compared to Schenectady

County as a whole (U.S. Census Bureau, 2015). The study sample had slightly higher percentage of women, Blacks/African Americans, and Hispanics. The U.S. Census Bureau's sample included more White/Caucasian and Asian individuals than the study's sample. Age could not be compared based on the information available. Demographic comparisons between the study sample and Schenectady County are illustrated in Table 3.

Table 3

Demographic Comparisons in Schenectady County

	Female	Male
Study Sample	59.50%	40.50%
U.S. Census Bureau	51.30%	48.70%

	White	Black	Hispanic	Asian	Unknown
Study Sample	64.60%	24.10%	7.60%	1.30%	2.50%
U.S. Census Bureau	79.60%	11.30%	6.60%	4.50%	*

** not reported*

Testing Statistical Assumptions

To ensure that the data were appropriate for the statistical analysis performed, the assumptions for each test were verified prior to the analysis. Using IBM SPSS Statistics version 21.0 for analyses, violations of normality, homogeneity of regression, and numerous outliers were demonstrated. Opportunities for addressing the violations are discussed below.

Missing data. There were four cases where sample participants chose not to identify with any particular race in both Care Team Connect as well as Soarian Clinicals. As a New York State health home, Care Central is required to complete intake forms that contain demographic information upon enrollment and reaffirm annually as long as the individual is actively enrolled in services. Information collected is then entered into Care Team Connect. Upon each patient's visit to Ellis Medicine for any service (including, but not limited to, ER usage), they are asked for their demographic information, which is entered into Soarian Clinicals. For this study, individuals' races were identified using both Care Team Connect and Soarian Clinicals. In the four cases where individuals declined to identify race, declination was verified in both systems and within individual consent forms; those individuals were designated in the study as "unknown."

Outliers. I identified outliers in this study in different ways. IBM SPSS version 21.0 was used to create a boxplot. There were numerous outliers for the dependent variable of ER utilization for both overall mean and anniversary mean. Large numbers of ER visits were re-verified within the Soarian Clinicals database for each time period. Ranking and data and using the "outlier labeling rule" was inappropriate for the dataset due to the large frequency of cases with no ER visits and small means of less than 1.0. Large variation in ER utilization for a small number of cases was an important aspect of the data set that added value to the calculation and interpretation of results.

Sphericity. Due to the results of Mauchley's test of sphericity, which demonstrated sphericity criteria was not met ($p<0.75$; $p=0.00$), the Greenhouse-Geisser statistic was used to adjust the epsilon value when performing statistical analyses. The Greenhouse-Geisser correction is a conservative correction and is recommended when estimated epsilon is less than 0.75 (Lund Research, 2013b). Using the correction affects degrees of freedom, mean sum of squares and *p*-value; however, sum of squares and f-statistic are not affected. Due to the violation of sphericity, the researcher would fail to reject the null hypothesis of sphericity that the variances are equal.

Homogeneity of regression. IBM SPSS version 21.0 was used to run a one-way ANOVA to determine whether the assumption of homogeneity of regression was met for the covariates for each of the means used in study (the average overall pre and post enrollment and anniversary date). For gender, there were three values with a statistically significant Levene's test: the overall mean prior to enrollment (p=.007), the overall mean following enrollment (p=0.050), and the 12-month anniversary mean, which accounted for the last quarter following enrollment (p=.017). For race, overall mean prior to enrollment (p=.036), 12-month anniversary mean (p=.000), and 3-month anniversary (p=.029) violated homogeneity of variances. In the age category, every single mean was significant for Levene's test (p=0.00); this supports that there was already a statistically significant difference in utilization by age group prior to health home enrollment. In all of the aforementioned cases, violations supported the investigator's rejection of the null hypothesis of equal variances, meaning that there is a difference between the variances in the population.

One-Way, Repeated-Measures *t* Test

RQ1: Is there a reduction in the average ER utilization rates among mental health clients enrolled in Schenectady County's health home when comparing the average ER visitation rates one year prior to and following enrollment in the program?

$H_0 1$: Mental health clients' participation in Schenectady County's health home will not reduce ER utilization rates when comparing the average ER visitation rates one year prior to and following enrollment in the program.

$H_a 1$: Mental health clients' participation in Schenectady County's health home will reduce ER utilization rates when comparing the average ER visitation rates one year prior to and following enrollment in the program.

The results of comparing mean ER utilization 12 months prior to (μ=.4810) and 12 months following (μ=.4304) health home enrollment demonstrated a slight reduction for participants with mental health conditions; however, the reduction demonstrated was not statistically significant (p=.574). It is important to note that ER usage accounted for in this study were required to have a primary or secondary mental health diagnosis; visits attributed to medical reasons were excluded. The standard deviation for the mean of post health home enrollment ER utilization (SD=1.21130) was larger than pre-enrollment (SD=1.00617), indicating increased range in ER usage after/during participation. In performing the t-test, the confidence interval was compared to the level of significance, α= .05. Results support that the researcher should fail to reject the null hypothesis that mental health clients' participation in Care Central did not reduce ER utilization rates when comparing the average ER rates one year prior to and one year following enrollment in the program. Overall, mean ER utilization rates for eligible individuals with mental health conditions prior to and following enrollment are illustrated in Table 4.

Table 4

Overall Changes in Mean ER Utilization

	Mean	Standard Deviation
Pre-Enrollment	0.481	1.00617
Post-Enrollment	0.4304	1.2113
Significance	0.574	

One-Way, Repeated-Measures ANCOVA

RQ2: Is there a reduction in average ER utilization rates of mental health clients enrolled in Schenectady County's health home at their three, six, and nine, and twelve month anniversaries, while controlling for age, race, and gender?

> Ho2: There is no reduction in the average ER utilization rates for Schenectady County's health home participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.
>
> Ha2: There is a reduction in the average ER utilization rates for Schenectady County's health home participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

The results of comparing means at enrollment (μ=.61), 3-month anniversary (μ=.46), 6-month anniversary (μ=.45), 9-month anniversary (μ=.44) and 12-month anniversary (μ=.38) demonstrated no statistically significant difference in any time period (p>.05) in the absence of consideration of covariates. Again for this analysis, confidence interval was compared the level of significance, *α,* of .05. After analyzing the results of a one-way, repeated-measures ANCOVA, no statistically significant relationships were identified comparing mean ER utilization at anniversary dates after enrollment, while controlling for race, age, and gender. The Tests of Between-Subjects Effects Table described which covariates were predictors of ER utilization. Race (p=0.052) and gender (p=0.164) were not statistically significant predictors of ER utilization; however, age did have a statistically significant impact (p=0.001), which aligns with the violations described in the homogeneity tests. Despite the significant effect age had on mean ER utilization, the Test of Within-Subject Effects table demonstrated that the overall results still did not display a statistically significant difference between the means when controlling for age (p=.605). When controlling for race (p=.794) and gender (p=.830), again mean ER usage rates were not statistically significantly different. Previous sphericity violations were accounted for in this analysis by using the Greenhouse-Geisser p-value. Results support that the researcher should fail to reject the null hypothesis that there is no reduction in the average ER utilization rates for Schenectady County's health home participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, when controlling for race, age, and gender.

Summary

This chapter presented the results from the study. Demographic results demonstrated that the sample drawn was mostly white females, and the average age of participants was 45 years old. Compared to Schenectady County as a whole, the sample contained more women and more participants of black/African American and Hispanic races. Also of note, there were violations of assumptions regarding normality, sphericity, and homogeneity of regression.

Based on the results from the one-way, repeated measures *t*-test comparing mean ER utilization prior to and following enrollment, the researcher failed to reject the null hypothesis that mental health clients' participation in Care Central will not reduce ER utilization rates when comparing the average ER visitation rates one year prior to enrollment to one year following enrollment in the program. Although there is a slight reduction in mean ER utilization, results were found to not be statistically significant. Results from the one-way, repeated measures ANCOVA also support failure to reject the null hypothesis that there is no reduction in the average ER utilization rates for Schenectady County's health home participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

Overall, the results from this study revealed that there was not a statistically significant reduction in ER utilization when comparing a sample of individuals with mental health conditions prior to and following enrollment in Schenectady County's health home, Care Central. Chapter 5 will discuss what the findings mean in the context from which they were gathered and explain how the results answer the research questions asked. Also, findings will be interpreted within the theoretical concept of the HBM. Limitations of the study and recommendations for future practice and research will be identified to better understand how the study contributes both generally and specifically to knowledge of health homes and their larger impact on the populations served. Social change implications will be described at the individual, organizational, and societal levels to identify appropriate methodological, theoretical, and empirical implications.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to examine the impact of participation in Schenectady County’s health home on ER utilization of enrolled individuals with mental health conditions. I used a quantitative, longitudinal, retrospective approach to gather data, and used IBM SPSS version 21.0 to analyze the data and generate results. This research encompassed individuals who reside in Schenectady County and are enrolled with health homes services administered by Care Central. Mean ER utilization was compared prior to and following enrollment as well as at quarterly intervals, while controlling for covariates of age, race, and gender.

Key findings of the study demonstrated the absence of a statistically significant difference between the ER utilization prior to and following participation in Care Central. The results of a one-way, repeated-measures *t* test supported my failure to reject the null hypothesis that mental health clients’ participation in Care Central does not reduce ER utilization when comparing average ER visits one year prior to and following enrollment in the program. Furthermore, a one-way, repeated-measures ANCOVA again maintained failure to reject the null hypothesis that there is no reduction in average ER utilization rates for Care Central participants with mental health conditions at 3, 6, 9, and 12 month anniversaries following enrollment, while controlling for age, race, and gender. Findings of the study showed that there are opportunities to expand on current knowledge that may lead to positive social change and better service coordination for individuals with mental health conditions.

Interpretation of the Findings

Results from this study extend knowledge on the impact of participation in Schenectady County's health home, specifically for its enrolled mental health population. Findings are not generalizable to all health homes, all health home clientele, or all Care Central enrollees, since not all of those enrolled have been diagnosed with a mental health condition. The application of research results outside the scope in which they were gathered would be irresponsible due to the varying practices across health homes. Although findings indicate that health home participation did not have a statistically significant impact on ER utilization for the target population, there is a possibility that enrollment impacts ER rates for individuals with chronic health conditions or individuals with substance use disorders. Additionally, the research conducted only examined ER visits with a primary or secondary diagnosis related to a mental health condition; it is possible that the target population's ER usage for reasons other than mental health decreased. Furthermore, due to the wide variety in policies, procedures, and programmatic implementation of health homes across New York State and the United States in general, there is reasonable cause to consider that participation in other health homes may significantly impact ER utilization for participants with mental health conditions.

Findings from the one-way, repeated measures *t* test were not consistent with current literature that indicates the general, overall effect of health home participation in reducing ER utilization for its enrolled participants. Vermont's health home, Blueprint for Health, demonstrated almost 30% in savings for its enrolled patients; however, this was in its fifth year of operation and included participants with chronic health conditions and hospital admissions (Bielaszka-DuVernay, 2011). In further disagreement with existing research, results from the one-way, repeated-measures ANCOVA demonstrated that controlling for age, race, and gender did not impact the effect of health home participation on ER utilization for participants with mental health conditions. Existing literature has shown inequities in access to outpatient services, provision of diagnosis, and ER utilization related to race, gender, and age; however, these findings were not supported in this specific population of individuals participating in Care Central. Information gained from this research shows the need for further and continuous research on ER utilization, cost savings, and service usage among various populations served by each health home.

Using the lens of the HBM, I found an absence of a significant effect on the perceptions of health home participants with mental health conditions in regards to their ER utilization. With each of the research questions, I examined a potential change in participants' perceptions as demonstrated by behavior (behavior influenced by care management practices that intend to support self-efficacy). ER utilization, similar to self-efficacy, is influenced by many factors including perceived susceptibility, severity, benefits, barriers, and cues to action. Participation in Care Central's health home provides opportunities for mental health participants to increase self-efficacy and self-management; one of the intents of health home enrollment in general is to reduce the use of acute care services such as those provided in the ER. Findings demonstrated the absence of a statistically significant reduction in utilization, indicating that participation in Care Central does not having a large enough effect on the factors that influence self-efficacy to elicit the desired behavior change. Further exploration of Care Central's care management practices using the lens of the HBM would be recommended in order to identify best practices that support self-efficacy.

Limitations of the Study

Numerous considerations need to be made when considering the generalizability of the study. Varying practices and general infancy of health homes limit application specifically to the sample population of Care Central participants with mental health conditions. The study's population may have had unique characteristics, exposures, or tendencies that would not appropriately describe another clientele. Similarly, care management practices differ between health homes and even between individual care managers in the same health home. Applying outcomes to describe other health homes' progress in reducing ER utilization, especially those with different populations and procedures, would be inappropriate and threaten external validity.

Time was a potential limitation of the study performed. Selection bias posed a threat due to the group of individuals who did not qualify as a result of their inability to actively participate in Care Central for a consecutive 12-month period. It is possible that those who were lost to the program, regardless of reason, represented a specific subpopulation; omitting this group may decrease the generalizability of the current study in representing individuals with mental health conditions enrolled in Care Central. Length of required enrollment for inclusion posed another potential limitation. The research period for the study was limited to twelve months prior to and following health home enrollment; there is a potential that the effects of a reduction on ER utilization take longer to identify than the period of time included in the study. Existing literature that demonstrates general reductions in service utilization often describes effects after a 5-year period, providing more opportunities for participants to become invested in the health home programs, learn self-management skills, and establish strong connections with their care managers that increase accountability and motivation. There were no previous studies regarding Care Central's impact on mental health clients' ER usage, allowing this research to serve as a basis for further investigation.

Another limitation of this research was my use of Ellis Medicine's Soarian Clinicals database as the sole source of ER data. It is possible that the sample utilized ERs other than that of Ellis Medicine, meaning that participants visited an ER outside of Schenectady County. because of clients' knowledge of and consent for the data exchange between Ellis Medicine and Care Central, it is possible that sample participants opted to visit another ER in attempt to conceal their service utilization from their care managers. Furthermore, reliance on Care Team Connect and Soarian Clinicals databases for accurate data collection does not exclude the opportunity for either human or technological error to influence results. There is a possibility that the mental health diagnoses identified are inaccurate or that ER visits documented with a primary or secondary mental health diagnosis were influenced by diagnostic overshadowing.

Quantity and quality of the monthly contact each participant received is another factor that can impact the way in which ER utilization is affected by health home participation. Although there is a minimal requirement of one monthly contact between care managers and clients, some clients may have received more or less support and/or face-to-face meetings, leading to different levels of connecting with the healthcare system and abilities in self-management. Maturity was another naturally-occurring limitation that is evident in longitudinal studies. The natural maturation of participants with mental health conditions, independent of health home participation, could impact ER utilization. When making between-group comparisons in this study, I examined results with reservation, understanding that pre-existing differences may play an unknown role in the effects that were identified.

Recommendations

This study identified opportunities for further research and changes in practice that may result in enhanced service coordination, care, and outcomes for health home participants with mental health conditions. Results dissented from current literature that supports that health home participation reduces ER and high-cost service utilization. Digression from previous research further illustrates the need for further, specific, and ongoing evaluation for each health home, both in regards to its outcomes and its internal practices and policies. In order to best understand the effect of general health home participation on ER usage, it is recommended that each health home individually analyzes outcome measures for its unique population.

In addition to variance in target population, Care Central's internal infrastructure should be more explicitly established and enforced. Care management practices vary to such a significant degree that the impact of participation in one health home could not responsibly be used to illustrate another, let alone individual care managers' practices within the same health home. Within a single health home, care managers' engagement strategies can differ greatly, offering minimal or maximal opportunities to inspire client self-management. Although there is a monthly contact requirement, enforcement is lax and there is nothing that prohibits care managers from restricting contact to monthly phone calls as opposed to face-to-face meetings, appointment attendance, or other enhanced levels of communication. Individuals with mental health conditions may benefit from consistency from their care managers and the provision of clear expectations upon enrollment. Health homes may further benefit from the individual analysis of each care manager's clients' high-cost service utilization as a quality improvement strategy and seek to identify and standardize best practices.

Data analyses supported the lack of a statistically significant relationship, making it reasonable to recommend that a general study is performed involving all of Schenectady County's health home clients, not solely those with mental health conditions. Care Central works with many clients with chronic medical conditions; a statistically significant reduction in ER utilization within that specific group is possible. Further analysis regarding the type of mental health condition or number of diagnosable conditions would bring new understanding to whether certain diagnoses would be more responsive to a tailored care management approach. Care Central currently utilizes the same outreach and engagement strategies for individuals with mental health conditions and those with chronic medical conditions. Attempts to assign health home clients to type of care manager (e.g. social workers as opposed to nurses) is based on subjectivity and is often complicated by the coexistence of mental health and chronic medical conditions. A recommendation is for Care Central to develop interdisciplinary teams to work with individuals; this would enhance opportunities for success, regardless of diagnoses. Additionally, it may be beneficial for a differentiated approach be used for health home enrollees with mental health conditions as opposed to enrollees with medical conditions. Recognition of the complexity of needs, differences in perceptions, and high-risk nature of the population of clientele with mental health conditions is vital to the success of Schenectady County's health home in impacting ER utilization as intended.

Another recommendation resulting from the findings of this study is for Care Central to more consistently outline documentation requirements by care managers. One of the limitations of the study was a result of inconsistent documentation practices, making it difficult to identify the client's length of time enrolled in the health home. Clear records should be kept regarding a participant's involvement with the health home; this will provide more opportunities for client progress, based on the health home's experience with that specific individual. Developing a consistent method of recording and tracking enrollment and milestones will empower care managers that may be assuming a new role with the enrolled individual, especially since fluctuation between care managers commonly occurs. Aside from its beneficial impact on care management practices and the clientele, reliable records of each participant will allow for further, more comprehensive analyses regarding the effect of participation on service utilization and other outcome measures.

In order to maximize the effect of health home participation on self-efficacy and service utilization, it is recommended that Care Central implement opportunities for continuous client feedback throughout enrollment. There should be methods for enrolled clientele, especially those with mental health conditions, to express their experiences with the care management process and how they feel it is or is not empowering them to self-manage. It is recommended that a policy regarding feedback, as well as specific procedures for enforcement be outlined. In addition to initiating processes for comments, it is suggested that participants' outcomes be evaluated constantly and consistently. Through routine appraisal of the self-management levels of their clients, Care Central can improve the recognition of challenging areas and initiate dialogue regarding opportunities for improvement. At the minimum, quarterly reviews of each participant's service utilization should be made on throughout enrollment; this too, will allow for a better understanding of changes that need to be made. Further research such as a prospective, longitudinal, qualitative study would provide more specific insight into the perceptions of enrolled participants in Schenectady County's health home.

Implications

The findings of this study indicate the opportunities that exist for Care Central to reduce the ER utilization of its participants with mental health conditions. The lack of statistically significant reduction on ER utilization implies that a different approach is needed in order to achieve the outcome measures desired. The findings from this study have the potential to impact social change by inspiring changes to the care that is provided to individuals with mental health conditions. Health home services offered by Care Central, as a supplemental service to medical care and social work, need to better account for the needs of the target population in a meaningful way if a reduction in ER utilization is desired within its population of clients with mental health conditions. Infrastructure changes on an organizational level may offer opportunities for increasing participants' self-management skills through consistent client feedback, quarterly monitoring of outcome measures, and refining strategies for working with individuals with mental health conditions.

On a macroscopic level, results of this research can encourage other health homes to examine their current progress in reducing high-cost service utilization, implement continuous quality improvement strategies, and analyze their work and outcomes with specific populations, such as those with mental health conditions. If other health homes initiate similar research, it can lead to large improvements in care for various populations, we well as justification for sustaining health homes as a valuable, cost-effective support for community members in need of additional support.

Theoretical implications of the study suggest motivation for changes in Care Central's practices. Due to the lack of a statistically significant impact of participation on ER visits, Care Central may want to consider specific ways to address perceptions that contribute to ER utilization. For example, participants with mental health conditions may need further support in understanding the severity of a condition that required emergency attention. The lack of a statistically significant reduction in ER utilization among the sample could be for many reasons, most obviously the mental health condition(s) experienced by all participants included in the study. Reflection on and investigation into cues to action for ER usage and self-efficacy towards self-management will improve Care Central's ability to make the desired changes in utilization trends.

Conclusion

The findings of this study divert from existing literature regarding the impact of participation in health homes on ER utilization. Using a sample of individuals with mental health conditions that were enrolled in Care Central for a minimum of twelve consecutive months, ER usage was compared for participants prior to and following enrollment in the health home. IBM SPSS version 21.0 was used to perform a one-way, repeated measures *t*-test and a one-way, repeated measures ANCOVA. Following the first analysis, results supported the researcher's failure to reject the null hypothesis that mental health clients' participation in Schenectady County's health home will not reduce emergency room utilization rates when comparing average ER visitation rates one year prior to enrollment to one year following enrollment in the program. Similarly, findings from the second analysis supported the researcher's failure to reject the null hypothesis that there is no reduction in average ER utilization rates for Schenectady County's health home participants with mental health conditions at three, six, nine, and twelve month anniversaries following enrollment, while controlling for age, race, and gender.

The findings from this study extend the existing knowledge regarding the impact of health home participation on ER utilization within Care Central enrollees with mental health conditions. Data analyses highlighted areas of opportunity, with resulting recommendations offering potential to impact infrastructure and overall participant outcomes. Future research is needed to further verify these findings as well as to explore results within other health homes and among other subpopulations, even those existing within Care Central's enrolled population. Findings may have meaningful impact on health home practices within Schenectady County, throughout New York State, and potentially across the nation. Recognition of Care Central’s lack of intended impact may positively affect social change by calling for further dialogue in how to best achieve outcome measures and encourage self-management when working with participants with mental health conditions.

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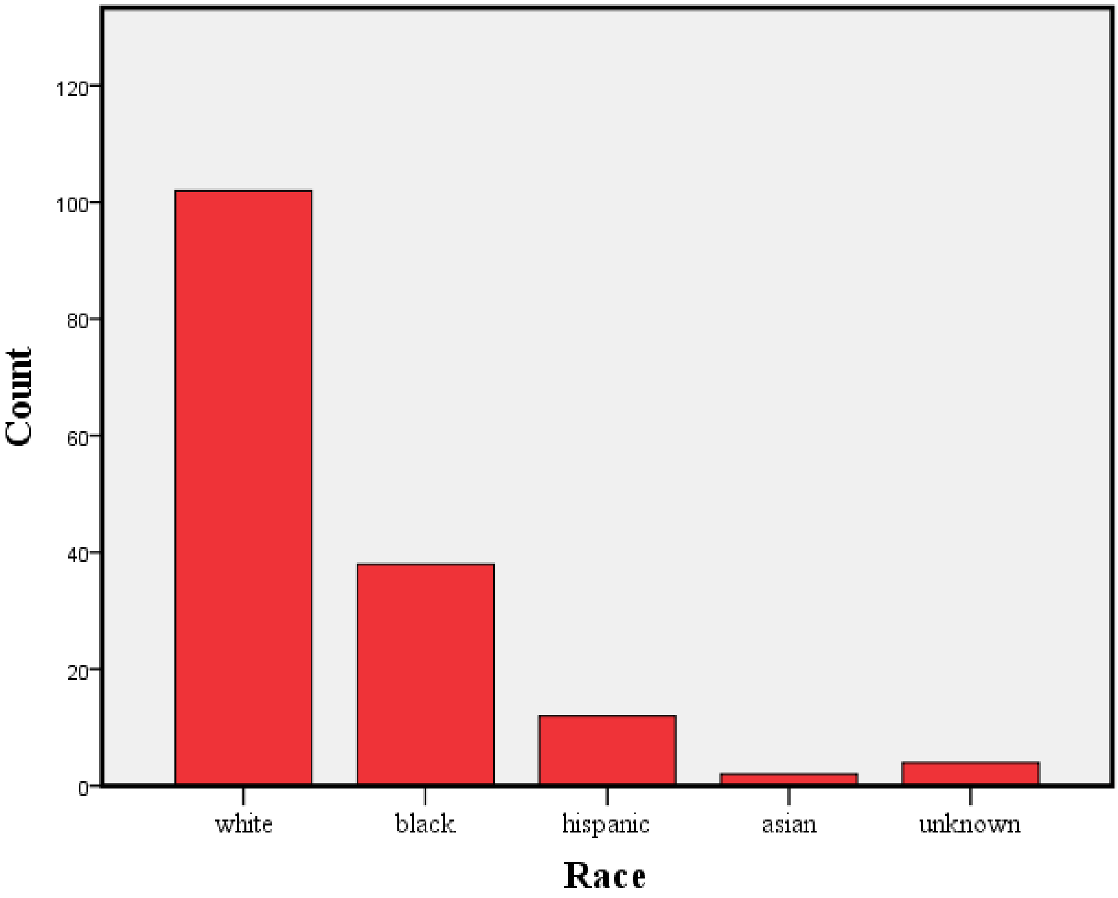
Appendix A: Race Demographics from the Sample



Appendix B: Gender Demographics from the Sample