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NURSING IMPACT IN MEDICAID CHRONIC DISEASE HEALTH HOMES:

A MIXED METHODS STUDY

by

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NURSING IMPACT IN MEDICAID CHRONIC DISEASE HEALTH HOMES: A MIXED METHODS STUDY

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The University of Texas at Tyler
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Managing individuals with chronic health conditions in the primary care setting continues to be a significant challenge in the U.S. health care system. This issue is further compounded for low-income individuals with both mental health and physical health chronic conditions. Nurses today are taking on new roles in the primary care setting in the midst of a changing health care system. With the enactment of the Affordable Care Act (ACA), new chronic disease health home opportunities have emerged to address the existing structural and process gaps found in primary healthcare. The nurse's role is integral to health homes as they empower nurses to play a greater role in improving patient experiences, population health, and lowering healthcare costs. Three research manuscripts presented in this dissertation portfolio focus on improving health care service delivery to individuals with chronic conditions. The first manuscript is a concept analysis of the term care coordination and its application in the primary care setting. The second manuscript is the description of Michigan's implementation a

Section 2703 ACA chronic disease health home. This manuscript highlights the importance of the nurse's role in the health home model. The third manuscript is a mixed methods study aimed to identify the nurse's perceived role and impact on patients with chronic conditions served in a health home. The study integrated qualitative information obtained from nurse interviews and a focus group with the quantitative Medicaid claims data from a sample of 874 patients. The Medicaid Health Home nurse's role and impact on patients' health care utilization patterns pre and post implementation are described and related to changes in emergency room use, hospitalizations, office visits, mental healthcare visits, and number of prescription medications.

Chapter One

Overview of the Program Research

The US has one of the world's most expensive healthcare systems with some of the lowest health outcomes among developed countries. Over one billion primary care office visits are provided annually, yet this care is the least studied and is not well understood (Haas, Swan, & Haynes, 2013). Over 145 million Americans have one or more chronic diseases, and current trends indicate that by 2030 this number will increase to more than 171 million as the population ages (Thorpe & Philyaw, 2012). The US spends more on health care per capita than any other country with current expenditures comprising 17.8% of the nation's gross domestic product [GDP] (Centers for Medicare & Medicaid Services [CMS], 2015; Majers, 2016). By 2020, approximately one-fifth of the U.S. GDP will be spent on health care (Kaiser Family Foundation, 2012; Papanicolas, Woskie, & Jha, 2018). Additionally, Carver and Jessie (2011) indicates that the U.S. healthcare system has wide variances in how health care is delivered, which is partially attributed to a general lack of emphasis on primary care chronic disease management.

Improving chronic disease health care management for individuals with limited financial resources is aligned with the ACA state option of implementing a Section 2703 Medicaid health home [MHH] (CMS, 2010). The MHH goal is to improve health care outcomes, service utilization, and reduce cost through enhanced patient-centered care coordination and management for low-income individuals with both behavioral and physical health chronic conditions. The nurse is a key MHH team member who serves as the patient care manager and coordinator (Cantor et al., 2014; CMS, 2016; MDHHS, 2016a).

MHHs are relatively new to the health care industry with only 20 states electing to implement this optional benefit. Early quantitative studies indicate that MHHs can impact patient's health care utilization (CMS, 2016). While models related to creating health homes exist, there is a dearth of information pertaining to the nurse's perceptions of their role and impact in health homes. No research articles using content analysis, focus groups, or other qualitative methods related to the nurse's perceptions or their influence on health home patients with chronic conditions were found. This research presents a real opportunity to learn from this population (Haas et al., 2013; Lee, 2012). With the need to help people with chronic diseases and the opportunities that exist to effect change, conducting research to learn from MHH nurses provides an opportunity to gain new knowledge and improve the MHH care delivery model. An exploratory mixed method study approach by obtaining qualitative information to guide the quantitative part of the study, then integrating all of the information in the results. This study helped to fill the literature gap by providing information related to the nurse's perceptions and their impact in a MHH, and how their role impacts individuals with chronic diseases emergency room (ER) use, inpatient hospitalization rates, and office visit rates.

Introduction to the Articles

The research presented in this dissertation portfolio began with a concept analysis of care coordination as this is a central concept of health care management in MHHs. *Care Coordination Strategies in Reforming Health Care: A Concept Analysis* (Prokop, 2016) is the prepublication draft version that was published in a peer-reviewed journal (see Chapter Two). The article discusses the need to improve how health care is delivered from an individual provider standpoint as well as a system wide perspective, and how such delivery can be accomplished through improved care coordination. Care coordination is a term used in the context of reforming health care, improving how health care is delivered, and providing health care in a more cost-effective and efficient manner. Providing care coordination is integral to the delivery of high quality health care, which is needed for low-income at-risk individuals with chronic conditions (American Nurses Association [ANA], 2012; Moore, Dolansky, Hudak, & Kenneley, 2015; Prokop, 2016).

Addressing this issue begins with identifying gaps in the structure and process of the health care system, and then, determining how the nurse's role in health homes can improve how health care is delivered. First, it starts with the definition of care coordination and clarifying how this term can be applied to the clinical setting, and its application when using a multidisciplinary team. Clear identification of roles and processes are essential for a team to work effectively in addressing the needs of the patients.

The second article titled *Implementing a Medicaid Health Home: Michigan's Experience* (Prokop, Lapres, Barron & Villasurda, 2017) was published in a peer-reviewed journal and discusses the various steps pertaining to how the MHH structure of the model was designed, financed, met regulatory requirements, and was implemented (see Chapter Three). This information may be useful to other state Medicaid programs interested in implementing a MHH as the process is complex and requires significant resources. Section 2703 of the ACA allows Medicaid state agencies to create MHHs aimed at integrating care for individuals with both a behavioral and physical health chronic condition. Implementing a MHH is recognized as a shift in the traditionally reactive, fee-for-service health care system towards one that is more patient centered. The MHH model allows staff to encourage individuals to be more engaged in their health care and also adds a reimbursement structure that allows providers the flexibility to address patient specific issues (Thorpe & Philyaw, 2012).

While the MHH supports a multidisciplinary team for care coordination, the nurse is central to the process and integral to the functioning of the health home in impacting the patient’s health care decision making process. Nursing is at the core of this model, as this discipline serves to lead, keep the model intact, and assure fidelity. Haas and Swan (2014) identified nurses as natural leaders in this endeavor as they have the knowledge, skills, and attitudes required to not only complete this function, but to also assess the impact of care coordination on health outcomes (Haas & Swan, 2014; Cook et al., 2013). Healthcare providers face many challenges when providing health care, which go well beyond the office setting. Socioeconomic issues that include lack of food, shelter, transportation, poor health literacy, and mental health problems are also part of the healthcare equation. There is limited literature regarding the MHH nurse’s role is and how a nurse can effectuate change for low-income individuals with chronic conditions. More information needs to be gathered to better understand the patient’s health care needs and to identify and address health inequities or social determinants of health (Canady, 2018; Haas & Swan, 2014).

Chapter Four discusses the methods, analysis, and results of the exploratory mixed methods study that was completed to determine the nurse’s role and impact on health care utilization patterns for individuals with chronic diseases in a MHH. The qualitative portion was completed by conducting semi-structured interviews with seven MHH nurses and through a focus group comprised on 11 MHH nurses. Six common themes in defining the nurse's role in a MHH were revealed.

The qualitative study was also used to confirm the quantitative dependent variables to be analyzed and to determine if there were other variables to review. The qualitative findings were integrated with the quantitative findings to provide insight as to why the health utilization outcomes were either significant or not significant. The quantitative study included two groups. The first group was the intervention group, which included patients who were enrolled in the MHH. The second group was the comparison group, which included patients who were eligible for the MHH, but chose not to enroll. Independent *t*-tests, paired samples *t*-test, Wilcoxon Signed-Ranks Test, Mann-Whitney U, chi-square (χ^2), binomial tests, descriptive statistics, and content analysis were used to test research questions.

The nurses' role in a MHH and how their role cannot be underestimated is highlighted in the study. Nurses are trusted by patients and can engage and connect with patients in ways unlike other health care providers. While it is clear that nurses are well positioned to lead care coordination efforts, the value of such activities and the nurse's role and contributions in this process is not well studied and should be further evaluated (ANA, 2012; Lee, 2012, Prokop et al., 2017). Strengths and limitations, future recommendations, and a summary of findings were reported.

Chapter Five provides a brief summary and conclusion. Researchers need to continue to assess and implement new strategies to address health care concerns targeted towards reducing the gaps and barriers that negatively impact health outcomes of individuals with chronic conditions. While this dissertation provides insights into the nurse’s perceived role in a chronic disease MHH, the nurse’s role in this process needs to be further explored and defined. Limitations, implications for nursing practice and need for future research are discussed. Recommendations for future research of the nurse’s role in improving health care utilization and how this may impact policy changes are addressed in the conclusion.

Chapter Two

Care Coordination Strategies in Reforming Health Care: A Concept Analysis

Abstract

With the growing number of individuals with chronic conditions and the associated health care costs, there is a need to improve how health care is delivered from an individual provider standpoint as well as a system-wide perspective. Such delivery can be accomplished through improved care coordination. Care coordination is a complex term that encompasses the full array of health care delivery activities across all systems of care. This includes organizing the care, improving quality of health care delivered, and achieving cost savings. In working to achieve this goal, the nurse is well-suited to provide oversight in this process in assuring that the components of care coordination are conducted efficiently and effectively. While the nurse is the optimal provider for this position, the nurse's defined role in this process is not always clear. This concept analysis focuses on the term care coordination, which includes the definitions of care coordination, impact on nursing, attributes, antecedents, consequences, and empirical referents for this concept. Care coordination is also differentiated from case management to add clarity to the role.

Keywords – care coordination, concept analysis, nursing, case management, health care

Care coordination is a term used in the context of reforming health care, improving how health care is delivered, and providing health care in a more cost effective and efficient manner. Providing care coordination is integral to the delivery of high quality of health care, which is especially true for at-risk individuals with chronic conditions (American Nurses Association [ANA], 2012; Carney Moore, Dolansky, Hudak, & Kenneley, 2015). Section 2703 of the Affordable Care Act (ACA) provides states with the opportunity to implement Medicaid health homes in the primary care setting. This health home option allows states to build a person-centered coordination of care model that achieves improved health outcomes and population health in a cost-effective manner (Centers for Medicare and Medicaid Services [CMS], 2013). This model centers on care coordination and transition management methods in providing quality health care to patients with mental health and/or physical health chronic conditions (Haas & Swan, 2014). The overarching goal is to organize and improve access among medical care providers, behavioral health care providers, and community-based services and supports providers for the at-risk populations with chronic conditions (CMS, 2013). Care coordination is a concept frequently found in the literature related to health home models. While this term is frequently used, it is not always clear what is meant when an author references care coordination and how this compares to case management (McDonald et al., 2014).

How Care Coordination Applies to Patients with Chronic Conditions

Since the implementation of the ACA, more than 40 million uninsured Americans now have insurance and access to primary care. Many of these newly insured have one or more preexisting mental health or physical health conditions that would make them ideal candidates for a care coordinated health home model (Haas & Swan, 2014). The U.S. continues to face challenges in managing people with complex health care needs, and the cost of caring for individuals with a chronic illness accounts for roughly 75% of current health care expenditures (Haas, Swan, & Haynes, 2013; Oliva, 2010). There is a need to improve coordination of care in the outpatient setting where patients assume the responsibility to understand, organize, and follow-up on their health care. This becomes more challenging when patients with chronic conditions are following a complex and lengthy treatment plan (Lee, 2012).

The U.S. health care system provides over one billion outpatient primary care visits annually, yet this care is the least studied and poorly understood (Haas et al., 2013). Health care in the US has been characterized as either being overused, underused, or inappropriately used. These terms are aligned with financial unsustainability, poor health outcomes, and increasing number of uninsured (ANA, 2012). Care coordination is part of the strategy in achieving cost containment and transforming how health care is delivered, which is aligned with the health care reform efforts envisioned by the ACA (CMS, 2013).

Another foundational principle in this process deals with communication and assuring that health information is maintained and shared between providers. Inaccurate information among providers can lead to confusion, differences in what health care services are ordered for the patient, and higher costs, all of which collectively can lead to poorer patient outcomes. These health care inconsistencies can lead to poor coordination of care, thereby negatively impacting the patient. Poor coordination of care and services can disproportionately impact patients with chronic conditions and functional limitations (Carney Moore et al., 2015).

Significance to Nursing

As with any model or team, there must be a leader who possesses the correct knowledge and skill to lead the care coordination efforts. Haas and Swan (2014) identified nurses as natural leaders in this endeavor as they have the knowledge, skills, and attitudes required to not only complete this function, but to also assess the impact of care coordination on health outcomes. Care coordination is imbedded in the nurse’s role in assisting patients and families with navigating through the health care system. “Nurses have performed care coordination activities in ambulatory settings for more than 20 years, but their work in this area was invisible until a national study was done on the professional nurse role in ambulatory care” (Haas & Swan, 2014, p. 72). Cook et al. (2013) supported this notion by identifying associated competencies directly linked to three core areas of nursing practice; these include 1) providing information and education, 2) providing emotional and supportive care, and 3) facilitating coordination and continuity of care. Nurses are well-positioned to serve in the care coordination role in improving how health care is delivered (ANA, 2012).

Section 2703 of the ACA, which added Section 1945 to the Social Security Act, requires states to identify patients with chronic conditions, including a behavioral health condition, at risk for at least one other chronic condition, and who are at risk for poor health outcomes in determining eligibility for the health home model (CMS, 2010). This type of care coordination requires a patient-centered multidisciplinary collaborative team in which nurses are ideally positioned to serve in the care coordinator role and need to be recognized as the leader (Haas et al., 2013). Nurses are available to patients and can connect with patients in ways that doctors are unable. Nurses have the ability to work with patients to make health care more accessible (Ehrlich, Kendall, & Muenchberger, 2012). While it is clear that nurses are well-suited to lead such efforts, the value of care coordination activities and nurse's role and contributions in this process is not clear. (ANA, 2012; Lee, 2012).

Concept Definition

Concepts are abstract or generic ideas that call to mind something which may not be known in detail. Examples of a concept are love, happiness, or health. Concepts need to be clearly defined, and how they are used in theory or practice should also be clearly delineated so that anyone who reads or uses these terms can understand what is intended (Walker & Avant, 2005). In this instance, there is a need to define care coordination to help with organization of clinical practice environments and experiences (Foskett-Tharby, 2014).

Merriam Webster's dictionary has three separate definitions for coordination ("Coordination," 2015). The first is a general definition that states "the process of organizing people or groups so that they work together properly, the process of causing things to be the same or to go together well, and the ability to move different parts of your body together well" (para. 1). The second is a medical definition that states "the harmonious functioning of parts (as muscle and nerves) for most effective results" (para. 6). The third is a Latin definition that states co- + ordination, or ordinatio which means arrangement, or from ordinare which means to arrange. The word care is defined as making efforts to do something correctly and safely in an effort to keep someone healthy, safe and in good condition. It is also defined as to feel an interest in something or affection for someone ("Care," 2015).

Other disciplines also speak to the unifying or linking nature of the term coordination. In chemistry, coordination is defined as the formation of a covalent bond, which describes the linking of atoms (Chemicool, 2015). In the field of management, coordination is defined as "the unification, integration, synchronization of the efforts of group members so as to provide unity of action in the pursuit of common goals. It is a hidden force which binds all the other functions of management" (Management Study Guide, 2015, para. 1).

Coordination must be completed between other providers and entities during the patient's course of treatment as an interdependent management of specified activities (Lee, 2012; Röttger, Blümel, Fuchs, & Busse, 2014).

McDonald et al. (2014, p. 6) provides the following broad definition:

> Care coordination is the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care.

Ehrlich et al. (2012) defined coordinated care as a core function of team-based primary and community care with a goal of helping people manage complex chronic disease care needs. This definition further expands to include coordination and management of an individual's health care services, providers, and service delivery organizations to create an integrated network. Coordination of care is also the process in which patient care is delivered in an organized fashion by a team of professionals of various disciplines or provider organizations. It is a defining principle of primary care but requires far more effort than a physician alone can deliver. McDonald et al. (2014) found that care coordination means different things to different people and that there is no consensus definition, both of these issues contribute to the lack of clarity about the term's meaning.

Attributes of Care Coordination

Identifying the attributes of a concept is important in helping to convey meaning and give insight to help identify the defining characteristics (Walker & Avant, 2005). There are four main attributes noted for care coordination.

1. Communication - there must be a reliable and clear communication mechanism within the team, with other providers outside of the team, and with the patient. Communication needs to be well-designed, structured, frequent, and accurate as good communication allows the team to work more efficiently, helps to create relationships, and assures a common understanding of the patient's care and their direction of care. Bisiani and Jurgens (2015) indicated that cultural background, language barriers, and health literacy need to be evaluated and addressed in order to effectively communicate with the patient. Additionally, communication needs to be able to address other social determinants that may impact the patients care and must be considered a two-way communication process among other providers of health care or social services ((McDonald et al., 2014; Röttger et al., 2014). Carney Moore et al. (2015) noted that communication of clinical notes and other clinically relevant information must be completed in a timely fashion as delays and inaccuracies may negatively impact the patient.

2. Patient-centered - this is done by engaging the patients, treating them with dignity, and assuring they have provider and treatment choices. The primary goal with person-centered care and patient engagement is to have the patient more involved in the medical decision-making process and to improve their understanding of health care (Ehrlich et al., 2012). This team-based activity focuses on the needs of patients and helps them to navigate effectively and efficiently through the health care system. The purpose is to achieve their health care goals to facilitate the delivery of high quality care (McDonald et al., 2014).
3. Unified team approach - this requires every team member to bring their expertise to the team in an effort to collaborate and advance the patient care model. As part of the process, each member needs to understand how their discipline contributes to successful care coordination, what the roles and responsibilities are of the other team members, and how this fits into the larger system of care (Haas et al., 2013). Roles and resources must be clearly identified, and each team member should know what they are expected to complete, what to expect of the other team members, and what role the patient will play. Active patient participation is the preferred approach; however, for some, patients roles and participation by be limited by lack of ability (Foskett-Tharby, 2014).
4. Organized delineation of tasks - this includes the organization of activities or events which require thought, planning, and a strategy to manage linkages between providers, services, and the patient in providing quality health care.

This process provides unity and clear direction in how the patient's care is to be managed and allows for care to be modified in response to changing needs (McDonald et al., 2014).

Antecedents to Care Coordination

Antecedents are certain events or items that must be in place or set up before the concept of care coordination can occur (Walker & Avant, 2005). These are important to identify prior to launching a health home to assure the model has a good foundation. The antecedents include:

1. A health home model provides a comprehensive system of care framework for which all individuals on the multidisciplinary team must understand and agree to follow. A health home integrates and coordinates all primary and acute physical health care, behavioral health care, and long term care for individuals with chronic conditions. The health home provider is also responsible for providing linkages to other services and social supports (CMS, 2013). While nurses are well-suited to lead a health home, it should be acknowledged that no single professional is able to perform all required care activities themselves (McDonald et al., 2014; Foskett-Tharby, 2014).
2. A patient plan of care based on the patient assessment that is person-centered, provides information to the team, and is aligned with the health home model (McDonald et al., 2014). The plan of care must also include a mechanism for appropriate follow-up care and be amended with any patient change in condition. Additionally, the plan of care needs to include information from all

providers, which includes both physical and mental health services (Carney Moore et al., 2015).

3. Mechanism to identify the at-risk patients with chronic conditions or at risk of adverse outcomes who are in need of care coordination and who are willing to participate in such efforts. The goal of care coordination is to improve how health care is delivered with the end goal of improving health care outcomes. This notion is especially true for patients with chronic conditions as they typically need health care from multiple providers (McDonald et al., 2014).
4. Organizational structure and support that provides the foundation to allow for the creation and the implementation of a primary care, evidenced-based health home model as well as the ability to facilitate health care transitions. Care coordination does include a broader system of care process and being able to integrate health and social care services. It is also important to be able to support those individuals who may have behavioral health issues that need to be addressed and coordinated between physical health and mental health providers (McDonald et al., 2014; Haas et al., 2013; Carney Moore et al., 2015).
5. Electronic health records (EHR) and information systems that have interoperability and links to community resources is something that providers should have in coordinating care (Ehrlich et al., 2012). EHRs allow providers to have immediate access to clinical notes, lab values, and other health care services information as well as the ability to immediately transmit health care information to other health care providers. This can play a significant role in

improving care coordination processes, is less reliant on patient's abilities to remember and report health care information, and reduces duplication of services. (Carney Moore et al., 2015; CMS, 2013). It certainly is preferable to have the needed technology in place in helping to coordinate care; however, care coordination can still exist without it.

Comparison of Case Management and Care Coordination

McDonald et al. (2014) acknowledges that the terms case management and care coordination have been used interchangeably in various literature sources; however, there appear to be some general differences that may provide clarification as to how these terms do differentiate. Case management is defined as an assessment of the patient to determine medical, educational, social or other service needs. This is a collaborative process of assessment and facilitation in developing a plan of care that specifies the patient care goals, which include meeting an individual's health needs to promote quality, cost-effective outcomes. Case management is frequently based on a partnership relationship between the patient and case manager with the main objective to deliver a patient-centered and collaborative approach to discharge planning from a health facility. Other goals of case management largely refer to utilization of services such as preventing inappropriate hospital admissions and improving discharge planning and patient outcomes. Referrals to other services can be made as needed, but the responsibility for managing care is completed by the case manager (McDonald et al., 2014; Bisiani & Jurgens, 2015).

The term care coordination can be used more broadly to encompass a wider range of health care elements that integrates all resource knowledge that go beyond the provider and the patient. Here the term is used to identify a set of care coordination models in which the term case management or care management are included, and as such, is labeled a care coordination program. While the case management model has been considered a care coordination program, part of case management does include coordinated care as a component of this model (CMS, 2013; Wideman, 2014). Certainly, this adds to the confusion about how the two terms are interpreted.

The list of care coordination definitions provided in this article suggests that care coordination is a large encompassing term used to describe all of the components that are needed to ensure access to and receipt of health care. Terms such as care management, EHRs, ancillary services, lab results, and transitional care fall under the umbrella of the care coordination definition (McDonald et al., 2014). In Section 1945 of the Social Security Act, care management and care coordination are listed separately under the service description of a health home model, which suggests they are two separate and distinct services (CMS, 2013).

Furthermore, the US Office of Veterans Affairs (VA) indicates that care coordination efforts are used to supplement current health care practices, such as case management to enhance health care services. The VA is working to provide support programs targeted to improve care coordination services, which suggests that care coordination is a process outside of case management (McDonald et al., 2007).

Another issue that is used to separate these terms deals with the essence of time and specificity to a particular disease. Wideman (2012) stated “Case management services are growing in the healthcare arena but are most often for one particular point of care versus coordination along the continuum of care across time and settings” (p. 553).

Wideman (2012) expressed concern over how the role of some care coordination activities falls to family members or others who have not received proper training and do not feel they can meet the patients' needs in the caregiver role. Care coordination is described as the activities necessary to ensure that the patient's needs, health care goals, and preferences for health services are provided over time. This includes information sharing among different types of providers, insurers, and others involved in their health care. Care coordination is part of provider care, but in a broader sense it is also a general responsibility of any system of care (McDonald et al., 2014).

Consequences of Care Coordination

Walker and Avant (2005) describe consequences as the outcome or result of the concept occurring. The consequences of care coordination can lead to better health outcomes and economic advantages as there is a direct link between coordinated care and improved efficiency of health care utilization and quality of care (Lee, 2012). Consequences of a well performing care coordination model include improved patient satisfaction of care, a partnership in health care, improved provider-patient communication, a reduction of inappropriate emergency room utilization, enhanced clinical outcomes, cost savings, and fewer unmet needs. Patients will be more engaged and educated in their health care decision-making process, will show improved coping skills, will have higher patient compliance with attending appointments, and will decrease their use of inappropriate emergency room visits. Well performing models have shown to decrease medical errors and duplication of services, which leads to decreased costs (Dougherty & Larson, 2010; Haas & Swan, 2014).

Empirical Referents

Empirical referents allow for the measurement of a concept or to determine if it is present, which helps an individual to identify the concept (Walker & Avant, 2005). There are a number of empirical referents for care coordination that can be seen or measured. First, one can see an evidenced-based, well-developed health home model that includes a patient specific plan of care. Such documentation should also include information as it relates to team member input. A second item includes documentation that care was provided and the actions of the team in the provision of care. Third, a policy and procedure manual describing how to conduct team meetings to discuss care coordination approaches should be present; there should also be documentation that such meetings occurred. Fourth, a patient satisfaction survey can be completed to determine the impact the coordination has on patient experience, the perceptions of the health home model, and whether they believe it had a positive impact. Studies have shown a higher level of patient satisfaction and decrease stress when their health care is well coordinated (Cook et al., 2013).

Finally, monitoring of health outcomes and service utilization such as decrease use of the emergency room, decreased hospitalizations, and a decrease in the number of prescriptions are items that can be measured. Care coordination health home models have shown improvement pertaining to better use of the health care system, better health outcomes, and decreased costs (Oliva, 2010).

Conclusion

Care coordination is not simply management of a disease or providing information from point A to point B. It is a function and product of a team approach to providing seamless, safe, quality care for an individual by linking systems and people to improve health outcomes. Understanding how care coordination is defined and how its application to improving the delivery of health care services provided in the outpatient care setting is something our health care system needs. At-risk patients with chronic conditions need assistance in understanding how to better manage their conditions and navigate their way through the system (Lee, 2012).

Creating health home models to improve coordination of care and to improve health outcomes is part of the current ACA health care reform efforts as well as health industries' desire to improve how health care is delivered. These models have shown great promise of improving health care while cutting costs. Nursing is at the core of this model as this discipline serves to keep the model intact and assure fidelity. Health care providers face many challenges when providing health care that go well beyond their office setting. Socioeconomic issues that include lack of food, shelter, transportation, poor health care literacy, and mental health care are also part of the health care equation. These issues must also be addressed when providing evidence-based treatment for at-risk patients with chronic health problems (Haas & Swan, 2014).

While challenges exist and must be overcome, nursing care coordination efforts can and will greatly influence how health home models are designed and delivered. The nurse is integral to the care coordination model in helping patients overcome barriers to health care and reach their health care goals. There are many opportunities for researchers to further explore and define the concept of care coordination and to further clarify the nurse's critical role in this process.

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Chapter Three

Implementing a Health Home: Michigan's Experience

Abstract

As the number of individuals in the U.S. with chronic conditions and the associated costs in caring for these individuals continues to rise, there is a need to transform how health care services are delivered. Under Section 2703 of the Affordable Care Act of 2010, the federal government provides state Medicaid programs the opportunity to improve care coordination for people with chronic conditions in a person-centered approach through the establishment of health homes. Given the complexity of care for Medicaid beneficiaries with chronic conditions, addressing the social determinants of health and providing integrated care are central to effectively improving health outcomes and generating cost-savings. Although launching a health home model is a step towards improving care coordination and care management for high-risk individuals, there are myriad components to implementing such a program. The purpose of this article is to explain the process that Michigan policymakers undertook to implement its Section 2703 Medicaid health home initiative, named the MI Care Team. Authors present lessons learned for policymakers and stakeholders in other states seeking to implement a Medicaid health home. And they explain how the nursing profession is integral for health homes.

Keywords – care coordination, health homes, Medicaid, chronic conditions, social determinants, nursing

The prevalence of individuals with chronic diseases continues to grow as our population ages. In 2009, over 145 million Americans had one or more chronic conditions. If current trends continue, by 2030 more than 171 million Americans will have a chronic condition (Thorpe & Philyaw, 2012). A chronic disease is a permanent, nonreversible condition that may require continued medical management and observation. People with multiple chronic conditions are at greater risk for disability and poor functional status. Accompanying this increased trend in the prevalence of chronic conditions is the rising cost of providing health care for these individuals. Chronic disease management consumes roughly 84% of all public and private national health care expenditures (Anderson, 2010; Bleich et al., 2015; Majers, 2016).

The US spends more on health care per capita than any other country (Majers, 2016). In 2015, health expenditures comprised 17.8% of the nation's gross domestic product (GDP) (Centers for Medicare & Medicaid Services [CMS], 2015). By 2020, approximately one-fifth of the US GDP will be spent on health care (Kaiser Family Foundation, 2012; Papanicolas, Woskie, & Jha, 2018). These escalating costs and increases in the numbers of individuals with chronic conditions demonstrate the need for new and innovative models of care to improve care management for those with chronic conditions, while also containing health care costs (Majers, 2016).

The preceding notion is aligned with the Affordable Care Act's (ACA's) state option of implementing a Section 2703 Medicaid health home (CMS, 2010). Given the issues surrounding cost and management of individuals with chronic conditions, the health home option was an ideal project for Michigan to implement through its state Medicaid program. The purpose of this article is to identify the steps the Michigan

Department of Health and Human Services completed to implement its Section 2703 health home, called the MI Care Team.

Background

Medicaid was enacted into law in 1965 under Title XIX of the Social Security Act. Medicaid is a health care insurance program that serves low-income children, pregnant women, seniors, and individuals with disabilities. In 2017, the US Centers for Medicare and Medicaid Services (CMS) reported that Medicaid provides health coverage to roughly 69 million people. Medicaid is administered by states in accordance with federal regulations and requirements. The program is funded jointly by states and the federal government (CMS, 2015; CMS, 2017). As of April 2017, Michigan had roughly 2.3 million individuals enrolled in its Medicaid program. Michigan's Medicaid program is administered by the Michigan Department of Health and Human Services, Medical Services Administration (Michigan Department of Health and Human Services, 2017a).

The potential state and federal government cost savings associated with health homes for Medicaid enrollees are considerable, especially if the health care model can develop ways to successfully address both physical and behavioral health chronic conditions (Cantor et al., 2014). Compared to those with coordinated care, patients with chronic conditions who lack care coordination are more apt to seek care at emergency rooms and have hospitalizations that could have been avoided (Bleich et al., 2015; Glynn et al., 2011).

The goal of the ACA's Section 2703 health home (herein referred to as a health home) is to redesign how primary health care services are structured for individuals with physical health and behavioral health chronic conditions. The preferred health home result is to improve the effectiveness and the efficiencies in managing individuals with chronic conditions through enhanced continuity, care coordination, and increased accessibility. Health home funding is designed to support the establishment and strengthening of organizational partnerships to ensure bi-directional care coordination across settings during care transitions to prevent readmission and avoidable usage of high cost health care settings like the emergency department (CMS, 2013; Michigan Department of Health and Human Services, 2016a).

The health home model also allows for increases in Medicaid payment rates for clinicians who provide such services, which includes an initial payment followed by monthly management payments (Michigan Department of Health and Human Services, 2016a; Pourat, Charles, & Snyder, 2016). Health homes also allow clinicians to more effectively address social determinants of health, which acknowledges that health is partly determined by access to various social and economic opportunities and resources in homes, neighborhoods and communities. This may also include access to good quality schools, protecting workplace safety, and enhancing the nature of social interactions and relationships.

Social determinants of health that can negatively affect Medicaid recipients include homelessness, poor health literacy, lack of transportation to and from medical services, and difficulty obtaining affordable healthy foods—all of which may accompany poverty (Michigan Department of Health and Human Services, 2016c; Office of Disease Prevention and Health Promotion, 2017). Individuals eligible for the health home model tend to have more difficulty accessing health care services and obtaining basic elements of security (e.g., housing and nutrition) compared to the general Medicaid population. As a result, those eligible for health homes under Medicaid tend to have higher rates of avoidable inpatient and emergency department utilization (CMS, 2013; Michigan Department of Health and Human Services, 2016a).

Cantor et al. (2014) identified the efficacy of high-user care management and care coordination approaches for low-income Medicaid beneficiaries with medically complex chronic conditions. Such programs are most successful when they target individuals with high emergency room and inpatient service utilization. Finding ways to improve care while lowering health care costs for people with multiple chronic conditions is a pressing concern of state and federal policymakers. This is one of the reasons for health care shifting from volume-based to value-based health care under the ACA (Bleich et al., 2015).

Health Home Option for State Medicaid Programs

CMS provides state Medicaid programs with the option of implementing a health home to create a comprehensive person-centered system of care coordination for Medicaid eligible enrollees with chronic conditions. States have a significant financial incentive to implement the Medicaid health home option. If a state's health home plan is approved, the federal government provides a two-year enhanced 90% federal match to the state for health home services provided to eligible Medicaid enrollees (CMS, 2013). This can significantly reduce a state's financial obligation and allows for the reimbursement of services not traditionally considered reimbursable.

As part of the Medicaid health home federal oversight process, states must submit to CMS an assessment of program implementation, lessons learned, quality improvements, clinical outcomes and cost-savings estimates. This is to be completed once after the first two years of program implementation (CMS, 2013).

Michigan Health Home Funding and Federal Requirements

In line with the premise that health homes are intended to improve integration of mental and physical health care in primary settings, Michigan's Medicaid health home program planning began in 2014 when the state legislature appropriated funding through the gubernatorial-established Mental Health and Wellness Commission to implement primary care health homes in the state's Federally Qualified Health Centers (FQHCs). The purpose was to address gaps between the provision of physical health care in the primary care setting and the delivery of mental health services either through FQHCs or local Community Mental Health Services Programs. Michigan's health home program emphasizes health system transformation through practice-level integration and health information technology (IT) advancements.

An annual appropriation was awarded to the health home project from the State of Michigan's Mental Health and Wellness Commission (Mental Health and Wellness Commission, 2013). In addition, the Michigan Health Endowment fund provided a one-time grant to be used for the health homes (Michigan Health Endowment Fund, 2014). Together, these two funding sources comprise Michigan's state share to use as the state's 10% match for the health home project (Michigan Department of Health and Human Services, 2016a). With this funding, Michigan worked closely with CMS to design a health home program that is aligned with existing patterns of health care delivery.

CMS provides general guidance regarding practitioner roles, eligible population, design elements, payment structure, and expectations of a health home program. States have the flexibility to tailor their programs so that they meet specific needs of the health home's target population. CMS also gives states latitude in determining the patient diagnoses that are eligible for their Medicaid health home (CMS, 2010; CMS, 2013).

Section 1945(h) of the US Social Security Act identifies the minimum eligibility criteria that states must use when enrolling Medicaid beneficiaries in a health home model (CMS, 2013). States can decide if their health home model will include Medicaid individuals who have either two chronic health conditions, one chronic health condition and the risk of developing a second, or a serious and persistent mental health condition. A chronic condition may include, but is not be limited to: mental health conditions, substance use disorders, asthma, diabetes, heart disease, and a body mass index of greater than 25. States are given the option of targeting additional conditions with approval from CMS (CMS, 2013).

After significant analyses of healthcare utilization and cost trends of the population served by the state's FQHC primary care providers, Michigan elected to include individuals with a diagnosis of depression and/or anxiety in addition to one of the following conditions: asthma, diabetes, hypertension, heart disease, or chronic obstructive pulmonary disease. This enabled Michigan policymakers to effectuate a broad yet targeted program impact for individuals with a physical and behavioral health chronic conditions (Michigan Department of Health and Human Services, 2016a).

State Plan Amendment Process

A Medicaid state plan functions as a formal agreement between a state and the federal government, which the state must follow to receive federal Medicaid funds. In order to receive the 90% federal match rate for Medicaid health homes, a state must submit an amendment to its state plan, which CMS must approve. This higher match rate is a significant incentive for states as they pursue a Medicaid health home option (CMS, 2010).

CMS approved the Michigan state plan amendment in March 2016. But before receiving federal approval, a state must undergo a rigorous process of confirming that certain structures are in place and that state officials have taken certain steps to disseminate information about the plan to the public at large. Michigan and CMS staff worked closely throughout the development and submission of the health homes state plan amendment. This entailed monthly calls with federal staff who provided technical assistance needed to complete the submission of the state amendment plan.

Wide dissemination of the state plan includes notifying and soliciting comments from the state's Tribal Chair and Health Directors and completing a notice for the general public about the proposed plan. This process is completed by sending written notification to the Tribal Chairs and Health Directors, posting information on the Michigan Department of Health and Human Services website, and printing information in newspapers throughout the state. Additionally, dissemination to the public requires providing information about the costs, and programmatic details of the health home project and assuring that state matching funds have been appropriated and are available.

Prior to submitting a state plan amendment to CMS for consideration of a Medicaid health home, states are required to seek consultation with the US Substance Abuse and Mental Health Services Administration (SAMHSA). The consultation should address needs of the population to be served and issues pertaining to care coordination and management of behavioral health services. CMS and SAMHSA collaborate with each state during the state plan amendment development process to provide technical assistance to further assist states in program development. CMS created a web-based state plan amendment template to assist states with their state plan amendment submission process (CMS, 2013).

CMS grants states the flexibility to administer their health home programs with existing IT resources and structures (CMS, 2013). The state plan amendment requires each state to define these core components, describe the scope and provision of the core benefits, and explain how health IT will be utilized with these services. Additionally, states must report the federal core quality measures that they will use to evaluate care across their health home programs. States are also required to create their own quality monitoring and improvement plans outside of the federal core measures. Combined, these measures allow CMS, states, and providers to assess health home progress (CMS, 2013).

Preparing the Health Home Providers

Prior to Michigan's July 1, 2016 launch of its Medicaid health home, Michigan provided a two-day training with the selected health home providers in an effort to assure fidelity to the model. The Michigan Department of Health and Human Services partnered with the Michigan Primary Care Association (MPCA) in completing the provider training and conducting a readiness assessment for each health home organization.

The training allowed individual providers and the Michigan Department of Health and Human Services staff to discuss the theoretical aspects of the model, goals, IT training, billing, and other programmatic issues. Trainings will continue through the first two years of health home operations until July 2018, and then the need for trainings will be reassessed. In addition, Michigan created health home networks allowing various members of the health home core team to convene via conference calls to share their experiences and best practices.

The use of health IT is critical to the success of Michigan's health home. Michigan modified and tailored two different IT software packages that providers must use for this project. This included the waiver support application (WSA) and Care Connect 360 (CC360). The WSA facilitates the enrollment process; CC360 is utilized for care management and coordination by the MI Care Team provider.

For the enrollment process, the Michigan Department of Health and Human Services identifies all of the potentially eligible beneficiaries by reviewing claims data for those beneficiaries who are already receiving services at a health home site, but are not enrolled in the health home. Then the Michigan Department of Health and Human Services staff, using the WSA, provides a list to each health home provider so they can enhance outreach and ascertain if the beneficiary is interested in enrolling in the health home program.

Once an individual is enrolled, the health home providers can access the CC360 application, which affords comprehensive access to the enrollee's past five years of Medicaid claim and utilization data. This is an important IT application developed by the Michigan Department of Health and Human Services because it provides health home clinicians and administrators with enrollees' admission, discharge, and transfer information. It enables providers to track data for services such as laboratory, pharmacy, and care from other clinicians or health care delivery settings. The Michigan Department of Health and Human Services staff anticipate that by using the electronic health record and CC360 information, providers will have methods to track, follow-up, and evaluate referrals to Medicaid health home services (Michigan Department of Health and Human Services, 2016b).

CC360 also identifies beneficiaries who have high emergency department utilization and inpatient hospital admissions rates. Health home providers can query the data for specific health care patterns, which includes use of medications, preventive and, inpatient care. State staff are available on an ongoing basis to provide any needed technical assistance.

Prior to implementing the health home project, the Michigan Department of Health and Human Services had to formally promulgate the policy. This entailed announcing its initial comment phase, followed by a 30-day public comment period, during which any provider, stakeholder, or other individual could review and provide comment on the proposed policy. After all comments were reviewed, the final policy was released for a July 1, 2016 start date (Michigan Department of Health and Human Services, 2016b).

Implementation of Michigan's Health Home

There are many programmatic issues that must be addressed when implementing a Medicaid health home. The structure, financing and overall care coordination processes needs to be ready prior to starting services. Michigan state officials and MPCA staff worked diligently to assure the health home providers were prepared and ready.

After receiving federal heath home state plan amendment approval, state officials worked on establishing the core services, care teams, and payment mechanisms; arranging regular meetings with health home teams to assure model fidelity; and completing other aspects of implementing the Medicaid health home. State and federal core health home services include: (a) comprehensive care management, (b) care coordination and health promotion, (c) comprehensive transitional care, to assure a smooth, safe and efficient transition from a hospital or other settings to the next site of care (Bleich et al., 2015; CMS, 2013); (d) patient and family support; (e) referral to community and social support services, if relevant; and (f) use of health information technology (IT) to link services (CMS, 2013; Michigan Department of Health and Human Services, 2016b).

Michigan's eligible Medicaid health home providers include its FQHCs and Tribal Health Centers (THCs). Eligible providers must adhere to state-defined qualification and standards in order to maintain active status. The MI Care Team provides the core health home services through use of an interdisciplinary health care professional team. Per federal guidance and state policy, the Michigan health home teams must include primary care physicians, behavioral health consultants, nurse care managers, community health workers, health home coordinators and access to a psychiatrist or psychologist for consultation purposes (CMS, 2010; Michigan Department of Health and Human Services, 2016b). If appropriate, physicians can delegate assignments to nurse practitioners or physician assistants who are qualified to function in a medical clinician role. The provider team must convene regularly to monitor patient care and progress. The team should also coordinate care with dentists, dieticians, pharmacists, peer support specialists, and other providers that are not part of the core group. This helps to assure that care coordination is completed when rendered by providers outside of the MI Care Team (Michigan Department of Health and Human Services, 2016b).

The heath home provider’s role is to give each enrolled beneficiary access to an interdisciplinary care team that will design a care plan specific to the beneficiary's mental and physical health needs. This person-centered approach is designed to assure that the beneficiary's identified needs will guide the level and scope of each individual provider's involvement (Michigan Department of Health and Human Services, 2016a). Michigan also requires each participating FQHC to achieve Patient-Centered Medical Home recognition through a national organization (e.g., the National Committee for Quality Assurance) or an equivalent state-developed recognition process.

Selecting Health Home Providers

Michigan selected the FQHC health home providers for its health home through an Invitation to Bid (ITB) process, whereby interested providers submitted applications that a review committee based on standardized criteria. Because Michigan has a cap on the funding for the state’s share of the health home match, Michigan’s ITB process was instituted to limit health home FQHC provider participation to selected qualified applicants. Michigan Department of Health and Human Services’ officials estimated that the state could serve up to 12,000 individuals annually for the first two years of the project. Because Michigan’s health home model involved the provision of care coordination, which was a new type of distinct provider service, a revised Memorandum of Agreement had to be signed by the State of Michigan and each participating FQHC (Michigan Department of Health and Human Services, 2016c).

The enrollment process is an opt-in approach, meaning eligible beneficiaries decide if they are interested in participating in the Medicaid health home model. To encourage enrollment, FQHC clinicians explain to potentially eligible individuals the benefits of a health home (Michigan Department of Health and Human Services, 2016a).

Patient Engagement

Each state is required to have a uniform process for identifying potentially eligible enrollees and notifying them about the nearest Medicaid health home. Because enrolling in a Medicaid health home is an opt-in process, it necessitates beneficiary action (CMS, 2013). Michigan identified and sent letters to roughly 110,000 eligible individuals statewide. The FQHCs also conduct outreach to facilitate participation in the health home regularly.

Beneficiaries who choose to participate in a health home program must sign enrollment consent forms that allow health home staff to share health information with other providers in an effort to facilitate care coordination and communication. Beneficiaries are allowed to disenroll from the MI Care Team benefit at any time and without penalty (Michigan Department of Health and Human Services, 2016b). As of November 2017, 3,482 individuals were enrolled in the MI Care Team (Michigan Department of Health and Human Services, 2017b).

Payment and Financing

Michigan’s payment methodology for health homes builds on the tenet of value-based purchasing and provides a reimbursement mechanism for services that cannot be traditionally billed on a fee-for-service basis. Value-based purchasing refers to building accountability by integrating cost and quality with the goal of improving outcomes of care (Mkanta, Katta, Basireddy, English, & de Grubb, 2016). This tenet is predicated on improved care coordination, formation of health home teams, provision of services by community health workers, use of phone calls to beneficiaries, and actions addressing certain social determinants of health (Michigan Department of Health and Human Services, 2016a).

Michigan pays its health home FQHCs a monthly case rate. Initially, the Michigan Department of Health and Human Services will pay a once-in-a-lifetime-per beneficiary Health Action Plan rate when a provider has completed the initial health home assessment and developed a care plan. The second rate is an ongoing care coordination rate for executing the objectives outlined in the patient's health action plan. The ongoing care coordination rate is paid after a core health home service has been completed during the months subsequent to creation of the initial patient health action plan. Most broadly, the goal of the health home model is for clinicians to have regular and consistent contact with beneficiaries to proactively help manage their chronic conditions.

Cost Savings

A patient's overall health care costs tend to increase with the number of chronic conditions an individual has acquired (Glynn et al., 2011). Cost savings can be measured in several different ways. States can assess the costs of the cohort of health home enrollees prior to and after enrollment to determine if purported changes in health care utilization patterns are realized. This may include decreases in emergency visits and inpatient hospital admissions, as the health home shifts care from such settings and to a primary care home (CMS, 2013). Additionally, the Michigan Department of Health and Human Services can compare health care costs of health home enrollees to a control group. Combined, these evaluations allow states and CMS to analyze the effectiveness and costs of the health home intervention.

Other states with Medicaid health homes have found significant cost savings. For example, New York found that inpatient hospital services costs decreased by approximately 30% for a subset of individuals who were continuously enrolled in Medicaid health homes. Missouri's Community Mental Health Center (CMHC) integrated health care home showed an annual reduction in hospital and emergency department admissions (12.8% and 8.2%, respectively). Moreover, Missouri's two health home programs generated a cost savings of $2.9 million in 18 months (CMS, 2013). In addition to savings, CMS (2013) reported that preliminary impacts of the health home program on enrollees show an improvement in patient empowerment, care coordination, access to health care and other community-based services, and improved care transitions.

One of the most significant communication challenges is establishing formal relationships between health home providers and hospitals staff for purposes of information sharing. This could help ensure that health home providers are notified about health home enrollees' admissions to and discharges from the hospital setting. To improve transitional care coordination, it is necessary for health home providers to be notified of admissions and emergency room utilization in a timely manner. For this reason, CMS and the states work together to build strong health IT solutions that allow providers to access data efficiently.

Health Homes Evaluation

As part of the health home monitoring process, states are required to have an independent external entity complete an evaluation of the program. The Michigan

Department of Health and Human Services staff are working with the University of Michigan's Institute for Healthcare Policy and Innovation (U-M IHPI) to conduct this evaluation. U-M IHPI will compare health care utilization expenditures for beneficiaries enrolled and receiving services in the health home project and compare this population with Medicaid beneficiaries who are eligible for the health home but choose not to enroll. In addition, U-M IHPI will complete an FQHC health home provider implementation survey to inform the evaluation process.

The Michigan Department of Health and Human Services and MPCA realized that ongoing training and technical assistance is essential to the success of the health home initiative. To assure providers' adhere to the model design and to provide operational support, ongoing technical assistance is made available to the MI Care Team providers through additional trainings; creation of a public webpage, which is housed in the Michigan Department of Health and Human Services' website; regular care coordination conference calls; and health home topical webinars. The MI Care Team webpage (http://www.michigan.gov/micareteam) is regularly updated as more information becomes available.

Discussion and Conclusion

Implementing a heath home model entails a shift from the traditionally reactive, fee-for-service health care approach towards one that is proactive, encouraging individuals to be more engaged in their health care. It includes a payment and reimbursement model that allows providers to improve care coordination with the goal of attaining better patient outcomes (Thorpe & Philyaw, 2012).

Michigan recognized the merits of implementing such a model, allocating financial and human resources to launch it, and providing ongoing support to MI Care Team providers. While chronic conditions cannot be cured, improved care coordination can enhance patient outcomes and quality of life, and reduce health care costs.

Limitations

The Michigan Department of Health and Human Services created a MI Care Team manual and promulgated Medicaid policy for providers. One limitation with implementing the program with 10 different providers is that there may be some differences with provider proficiency. The expectation is that all providers will adhere to the specifications as outlined in the manual and the policy; however, interpretations and implementation of the program or patient engagement techniques may vary (Creswell, 2014). The MI Care Team is providing services in 10 FQHCs in Michigan; therefore, this is not a statewide program.

This article describes the process for implementing a health home under federal and state regulations. Although it pertains to one state, it could be applicable to other states where policymakers seek to implement a similar program. But the state specific issues and options will vary depending on state demographics and policy contexts.

Implications for Nursing Practice and Policy

Care coordination for individuals with chronic diseases, which is fundamental to the health home function, is central to the role of nursing. Haas and Swan (2014) noted that nurses have performed health care coordination activities for more than 20 years. The nurse historically has been a primary care coordinator and leader who has the knowledge and expertise to lead the care coordination efforts. Coordinated care is a core function of team-based primary and community care that delivers regular and supportive care to people with complex chronic disease care needs (Ehrlich, Kendall, & Muenchberger, 2012).

Nurses make important contributions to the MI Care Team model. The state plan specifies that nurse care managers play a central role in the health home model. Providing health home services requires a patient-centered multidisciplinary collaborative team in which nurses are well- positioned to serve in the care coordinator role and need to be recognized as leaders. Their primary MI Care Team function is to facilitate communication with medical providers, monitor assessments and screenings to assure findings are integrated in the care plan, participate in initial care plan developments, and assure patient education is completed.

The nurse’s role in a health home or other types of medical home models cannot be underestimated. Nurses are trusted by patients and can connect with patients in ways unlike other health care providers. Through their role in a health home, nurses have the ability to work with patients to make health care more accessible and improve patient engagement (Ehrlich, Kendall, & Muenchberger, 2012). While it is clear that nurses are well positioned to lead care coordination efforts, the value of such activities and the nurse’s role and contributions in this process is not well studied and should be further evaluated (ANA, 2012; Lee, 2012; Prokop, 2016).

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Chapter Four

Nursing Impact in Medicaid Chronic Disease Health Homes: A Mixed-Methods Study

Abstract

Purpose: To identify nurses' perceptions and the impact of their role on Medicaid health home (MHH) patients' health-care management, and to determine if the MHH influenced patients' health-care service-use patterns.

Participants: Registered nurses providing care in an MHH for greater than 6 months were included in the qualitative component. The focus group included 11 nurses and 7 nurses participated in individual interviews. The quantitative component included a total of 874 individuals (437 who participated in an MHH and 437 who chose not to participate in an MHH).

Methods: Guided by Donabedian's quality framework, an exploratory mixed-methods study was completed. A focus group and individual interviews comprised the qualitative study arm, and an ex post facto pretest–posttest design composed the quantitative study arm.

Results: Content analysis of qualitative data revealed six themes related to the nurse's role in an MHH: establishing trust and building relationships, listening to patients, patient engagement and goal setting, addressing social determinants of health, education, and having access to the nurse. Mann–Whitney U (*p* = .004) and Wilcoxon Signed-Ranks tests ($p = .042$) indicated that emergency room usage was statistically lower between and within the intervention group and the comparison group, and paired samples *t*-tests indicated that office-visit rates were significantly higher ($p = .013$) in the intervention group.

Keywords: chronic diseases, medical health homes, Medicaid, care coordination, mixed methods

The United States has one of the world’s most expensive health-care systems with some of the lowest health-care outcomes among developed countries. In addition to the disparity between cost and quality, the current health-care system may not be able contain costs and meet the ever-increasing chronic-care needs of the aging population (Carver & Jessie, 2011). Individuals with chronic diseases account for approximately 84% of national health-care expenditures, and by 2018, approximately one-fifth of the gross domestic product will be spent on health care (Bleich et al., 2015; Majers, 2016; Thorpe & Philyaw, 2012). The U.S. health-care system provides more than one billion primary care office visits annually, yet this care is the least studied and is not well understood (Haas, Swan, & Haynes, 2013).

In 2009, more than 145 million Americans had one or more chronic diseases, and current trends indicate that by 2030, more than 171 million Americans will have a chronic disease. The prevalence of individuals with chronic diseases continues to grow as the U.S. population ages (Thorpe & Philyaw, 2012). The cost of treatment and the prevalence of individuals with chronic diseases demonstrate the need for new and innovative models of care coordination and health-care management in the primary care setting (Cantor et al., 2014; Majers, 2016). Patients with chronic diseases who lack proper medical management are more apt to seek care in an emergency room (ER) and experience more hospitalizations that could have been avoided (Bleich et al., 2015; Glynn et al., 2011).

Problem and Significance

Unlike acute illnesses, chronic diseases do not resolve, and treatment is ongoing with a need for health-care management. The U.S. health-care system has wide variances in how health care is delivered (Carver & Jessie, 2011), perhaps partially attributable to a general lack of emphasis on primary care chronic-disease management in the U.S. system. The Commonwealth Fund reported that higher performing countries place more emphasis on primary care in their health-care-delivery systems (Davis, Schoen, & Stremikis, 2010). Health-care-management strategies vary in their application and can be limited for individuals with access to care barriers, who are low-income, and who lack health-care resources (Antos, 2013; Horwitz, 2015).

Improving chronic-disease health-care management for individuals with limited resources aligns with the Affordable Care Act (ACA) state option of implementing a Section 2703 Medicaid health home (MHH; Centers for Medicare & Medicaid Services [CMS], 2010). The Michigan Department of Health and Human Services (MDHHS) implemented a CMS-regulated Section 2703 MHH program on July 1, 2016 for patients with chronic diseases. The MHH provides care to Medicaid enrollees who are diagnosed with a behavioral health disease (i.e., mild to moderate depression or anxiety) and a physical health disease (i.e., diabetes, hypertension, heart disease, chronic obstructive pulmonary disease [COPD] or asthma). In general, Medicaid provides health-care coverage to low-income individuals. The goal of the MHH is to improve health-care outcomes and service use through enhanced patient-centered care coordination and health-care management for low-income individuals with both behavioral and physical-health chronic diseases to reduce costly ER visits and hospitalizations while improving access to primary care office visits. The nurse is a key MHH team member, as this discipline serves as the primary patient health-care manager (Cantor et al., 2014; CMS, 2016; MDHHS, 2016a).

Using the Donabedian quality framework with adaptation from the medical outcomes study conceptual framework (Agency for Health Care Research and Quality [AHRQ], 2007; Donabedian, 2005; Tarlov et al., 1989) to guide this research, the purpose of this exploratory mixed-methods study was to determine nurses' perceptions and the impact of their role on MHH patients' ER, hospital, and office-visit health-care service-use outcomes.

Review of Literature

The purpose of the review of literature was to identify current information, significant findings, and outcomes related to the assessment of Michigan's MHHs. This information helped identify what was known about the impact of MHHs, gaps in the literature, and other methodological issues. Information accrued from articles that discussed health homes, medical homes, disease-management models, and MHHs, as these terms aligned with enhanced care coordination and the nurse's role in the MHH. The terms found in the literature indicate enhanced care coordination in the primary care setting. Health homes and medical homes describe a primary care setting that manages the health of individuals with chronic diseases, whereas disease-management models focus on a specific disease (AHRQ, 2007; CMS, 2010). Limited articles described Section 2703 health homes and no articles related to Michigan's MHH.

Michigan offered Section 2703 health home services to individuals who met certain disease-eligibility criteria. The health home provider's role was to give each enrolled beneficiary access to a nurse-led multidisciplinary care-team-designed health-care plan specific to the beneficiary's behavioral and physical health needs (MDHHS, 2016a; Tarlov et al., 1989). The goal was to provide enhanced care coordination, improved access to care, and health promotion, while encouraging patient participation and family support. Community and social support services were used, if relevant, and health homes used health information technology to link services, where applicable (CMS, 2013; MDHHS, 2016b). The Section 2703 health home provider closely monitored each beneficiary through monthly contacts with the beneficiary either through an office visit or telephonically. Providing MHH services in 21 counties throughout the State of Michigan were 10 federally qualified health centers (FQHCs).

Nurses’ Perceptions of Their MHH Role

The FQHC provided core MHH services through the use of a health-care professional team affiliated with the designated center. The MHH team included primary care physicians, behavioral-health consultants, nurse care managers, community health workers, health-home coordinators, and access to a psychiatrist or psychologist for consultation purposes. The physician could delegate the medical clinician role to a nurse practitioner or a physician assistant, where appropriate. This team convened regularly to monitor patient care and progress. The team was also responsible for coordinating care with dentists, dieticians, pharmacists, peer-support specialists, and other providers outside of the core group, as appropriate. This format helped assure that care coordination was completed when care was rendered by providers outside the MHH (MDHHS, 2016b).

The concepts of health homes and care coordination are central to the role of nursing. Nurses have performed health-care-coordination activities for more than 20 years (Haas & Swan, 2014). Coordinated care was a core function of team-based primary and community care that delivers regular and supportive care to people with complex chronic-disease care needs (Ehrlich, Kendall, & Muenchberger, 2012). Nurses had a central role in the MHH, specifically identified as a health-care manager. The nurse is a primary care coordinator and leader who has the knowledge and expertise to lead the care coordination efforts (Haas & Swan, 2014). Providing MHH services requires a patient-centered, multidisciplinary collaborative team in which nurses are ideally positioned to serve in the care-coordinator role and need to be recognized as leaders. Their primary function was to facilitate communication with medical providers, monitor assessments and screenings to assure findings were integrated into the care plan, participate in initial care-plan developments, and assure patient education was completed (MDHHS, 2016a). A growing number of registered nurses are managing the health care of patients with chronic diseases, leading complex care-management teams to improve patient care and decrease cost of care, and are providing overall care coordination in the primary care setting and in other health-care settings (Granger, 2016).

The role of the nurse in a primary care setting is understudied and that role ambiguity was evident between nurses and among their multidisciplinary team members (Oelke, Besner, & Carter, 2014). Further work was needed to better understand and optimize the nurse’s role. Limited information is available regarding the nurse’s perceived role in a health home and no information was found in relation to an MHH.

Section 2703 MHH Impact on Chronic-Disease Outcomes

More than 40 million uninsured Americans now have insurance and access to primary care as a result of the ACA. Many of these newly insured people have one or more preexisting behavioral-health or physical-health diseases that would make them ideal candidates for an MHH (Haas & Swan, 2014; Mason, Gardner, Outlaw, & O’Grady, 2016; MDHHS 2016a). The United States continues to face challenges in managing health care for people with complex needs, as well as managing the associated costs (Christensen, Grossman, & Hwang, 2009; Haas et al., 2013; Oliva, 2010).

When health care professionals better coordinated health care services, some health homes have seen large reductions in chronic-disease exacerbations. By improving maintenance therapy and improving care coordination in managing patients' health care, Blanchette, Gross, and Altman (2014) found a 16 to 17% reduction in the incidence of exacerbations in the intervention group compared with the placebo group that did not receive an intervention. Glynn et al. (2011) found a significant effect of increasing age and lower socioeconomic status on prevalence of multimorbidity and other researchers have noticed this pattern as well. Health-care use and costs significantly increased among patients with multimorbidity ($p < .001$), and the addition of each chronic disease led to an increase in primary care consultations ($p = .001$, 11.9 versus 3.7 for greater than four diseases versus zero diseases) and hospital admissions ($p = .01$, adjusted odds ratio of 4.51 for greater than four diseases versus zero diseases).

Fillmore, DuBard, Ritter, and Jackson (2014) looked at the impact of a health home from 2007 to 2011 for Medicaid disabled adults under 65 years of age. Through the review of Medicaid paid-claims data, they found that disabled adults on Medicaid represented 26% of the population, but accounted for 65% of program expenditures. An AHRQ (2007) analysis indicated that lack of care coordination often results in poor clinical outcomes such as repeated hospitalizations, excessive use of prescription drugs, medical errors, and patient dissatisfaction with care. Medicaid health-home models designed to provide care coordination have shown improvements in patient outcomes, as well as cost savings (Aysola, Bitton, Zaslavski, & Ayanian, 2013; Shane, Nguyen-Hoang, Bentler, Damiano, & Momany, 2016).

Health Home Service Impact on ER Use

A significant amount of literature identifies how health homes or coordinated care can reduce ER visits and how low-income individuals with behavioral health issues (e.g., diagnoses such as depression or anxiety) used the ER more than privately insured individuals (AHRQ, 2007; Antos 2013). Medicaid beneficiaries used the ER 50 to 100% more than privately insured individuals, and 26% of ER visits had a cooccurring behavioral health diagnosis on the claims reviewed (Antos, 2013; Cantor et al., 2014).

Homeless individuals averaged four ER visits per year compared to 1% of the general population having four ER visits, and 5% of the Medicaid population having four ER visits (Bharel et al., 2013). Over one third of ER visits related to behavioral-health disorders. Social determinants related to ER use, illustrating the need to provide coordinated health care. Health is determined in part by access to various social and economic opportunities and resources available in homes, neighborhoods, and communities (Bharel et al., 2013; Office of Disease Prevention and Health Promotion, 2017). Health homes allow providers to more effectively address social determinants of health. Relevant Medicaid social determinants of health include homelessness, poor health literacy, insufficient reliable transportation to and from medical services, and lack of access to healthy foods that may impact nutrition; each often accompanying poverty (MDHHS, 2017a; Office of Disease Prevention and Health Promotion, 2017). Homeless individuals have no or limited income and are Medicaid eligible in states participating in the Medicaid-expansion option (Cantor et al., 2014; CMS, 2013).

Medical homes can decrease ER visits and inpatient admissions by better coordinating care for individuals with chronic diseases (Bleich et al., 2015). For example, ER visits were higher for individuals enrolled in a health home initially, then decreased and became insignificant (Fillmore et al., 2014). Statistics suggested that initially, medical homes may accompany an actual increase in ER use, and the literature is inconsistent. Wang, Srebotnjak, Brownell, and Hsia (2014) looked at asthma related ER visits to determine ER-use patterns for asthma care for those who are insured, low-income, or uninsured. The researchers found that asthma-related ER visits were disproportionately common among low-income and uninsured people; those with incomes less than 100% of the federal poverty level used the ER most. When looking at the Medicaid, uninsured, and Medicare groups, a distinct difference in asthma-related ER visits emerged. Individuals receiving Medicaid had 54% of the asthma-related ER visits, uninsured individuals had 32%, and individuals with Medicare made up 14% of asthma-related ER visits.

Shane et al. (2016) completed a paid-claims analysis of Iowa’s Medicaid program beneficiaries (adjusted for age, sex, and Medicaid eligibility criteria) in their respective MHHs for ER visit use. The sample included 60,618 in the general Medicaid group and 5,808 health-home beneficiaries. The authors found that mean ER-use rate for the MHH group was 0.08 (*SD* = 0.267) during the study timeframe compared with the general Medicaid-group ER use of 0.03 (*SD* = 0.181). Cantor et al. (2014) found that among high ER users (defined as those having more than six ER visits over the 3-year study period), ER use for Medicaid individuals was double (15.7 average ER visits) compared to the all-payer population rate (7.7 average ER visits). Cantor et al. found that low-income individuals with chronic diseases had an increased incidence of using the ER (AHRQ, 2007).

Health-Home-Service Impact on Reducing Hospitalizations

A significant amount of literature identified how health homes can reduce inpatient admissions for individuals with chronic diseases, and how low-income individuals and individuals with behavioral-health issues have more inpatient admissions than privately insured individuals. Hospital admissions were quite expensive and added to the fragmentation of providing health care if they were not properly followed up (Christensen et al., 2009). As the number of chronic diseases increased, the number of hospital admissions increased (Glynn et al., 2011). Half of the hospitalizations in a study were attributable to behavioral-health disorders (Bharel et al., 2013).

Antos (2013) found that Medicaid beneficiaries had more inpatient hospitalizations than individuals with private insurance, whereas Cantor et al. (2014) found the high-user rate among Medicaid patients was not substantially different from the insured population. Therefore, the literature was conflicted. When individuals were enrolled in a health home, rates of hospitalizations were lower ($p < .001$), as rates declined from 420 per thousand per year (PTPY) to 384 PTPY for the enrolled population. This figure was considerably lower when compared to 552 PTPY hospitalizations for those in the unenrolled population (Fillmore et al., 2014).

Other MHH models showed improvements in reducing inpatient admissions. The AHRQ (2007) indicated that patients who experienced a decrease in hospitalization rates also reported improved functional status. The State of New York found that inpatient service costs decreased by approximately 30% for individuals enrolled in an MHH.

Missouri's Community Mental Health Center MHH showed a 12.8% reduction in hospital admissions for the study population, and a decrease of 8.2% for ER use (CMS, 2013). Consistent with these MHH models, Cantor et al. (2014) found that 38.6% of hospitalizations had a cooccurring behavioral-health diagnosis, and successful MHH models reduced inpatient admissions by 29% (CMS, 2013).

Health Home Service Impact on Office Visits

Limited literature discussed office-visit frequency for individuals in a health home. Literature reports were inconsistent: Fillmore et al. (2014) noted that office visits for the health-home enrolled group increased ($p < .001$) compared to office-visit use prior to entering the health home. Other literature sources indicated that the number of office visits decreased once someone was established in a health-home model. Pourat, Charles, and Snyder (2016) indicated that little evidence exists to assess the impact of these health home principles on the frequency of office visits. Glynn et al. (2011) compared the number of office visits with the number of individuals' chronic diseases and found that the mean number of office visits increased significantly as the number of individuals' chronic diseases increased ($p < .001$). Having health care managed in the primary care setting enabled patients to choose who delivered their health care and how it was coordinated (AHRQ, 2007; Glynn et al., 2011).

Gaps in Research

Limited articles described MHHs and most of the quantitative information was gleaned from medical-home-related articles. The MHH is relatively new to the health care industry, as MHHs emerged with the enactment of the ACA in 2010. Currently, 20 states have implemented a health-home program (CMS, 2016). Although models related to create health homes exist, a dearth of information pertained to nurses' perceptions of their role and impact in health homes. No research articles using content analysis, focus groups, or other qualitative methods related to nurses' perceptions or influence on health-home patients with chronic conditions. Therefore, this research presented a viable opportunity to learn from this population (Haas et al., 2013; Lee, 2012).

Theoretical Framework

Donabedian's quality framework, with adaptation from the Medical Outcomes Study's (MOS) conceptual framework (Donabedian, 2005; Tarlov et al., 1989) guided this research (see Appendix A and Figure 1). The Donabedian quality framework focuses on improving health care quality and the associated effects on patient outcomes. This model builds on the pillars of structure, process, and outcomes. The first pillar, structure, references the physical and organizational aspects of care settings. Examples of structure include improving information-technology solutions to identify issues that need action, or adding staff to perform additional functions (AHRQ, 2007; Donabedian, 2005).

The MOS conceptual framework included five items that are relevant to the structure of the MHH. The first was organization and how MHHs were administered in an FQHC that met specific criteria to become a health-home provider. The second was improved access to care in relation to the clinic setting, and that each MHH patient had a nurse care coordinator. The third was financial incentives, related to how MHHs received a monthly payment for providing enhanced care-coordination services (Kelly, Huber, Johnson, McCloskey, & Maas, 1994; MDHHS, 2017b; Oelke et al., 2014, Tarlov et al., 1989). The fourth required specific patient diagnoses to be eligible for the MHH. Comorbid diseases represented the fifth unique element of the model; individuals must have had both a behavioral-health and a physical-health chronic condition to be eligible (Kelly et al., 1994; MDHHS, 2017b; Tarlov et al., 1989). The MHH was provided in a community health center that was already positioned as a safety-net provider. With enhanced MHH funding to support the structure, the FQHC could further address health care issues by creating a multidisciplinary health care team (MDHHS, 2016a, 2017a).

The second pillar, process, required that agencies required modifications to improve how information flowed and designated staff roles and responsibilities. Processes relied on structure in providing resources and mechanisms for health care workers to carry out patient-care activities in promoting health, recovery, and functional restoration (Donabedian, 2005). Processes aligned with MHH goals for care delivery and care coordination. The MOS conceptual framework included three elements that influenced the process of care delivery, highlighted in the structure of the MHH. The first element was a patient-centered approach that focused on providing holistic care, tailored to the individual (MDHHS, 2017b; Oelke et al., 2014; Tarlov et al., 1989). The second element was nurses’ impact on health-service use in receiving certain services and not using services inappropriately, such as the ER (Cantor et al., 2014). The third element was patient participation or patient engagement and the importance of assuring patients had a say and were active participants in making health care decisions (Tarlov et al., 1989).

The third pillar represented outcomes—the positive or negative changes attributed to the healthcare intervention—which were concrete and precisely measured (Donabedian, 2005). In the MHH, these clinical outcomes related to service-use patterns such as ER visits, inpatient hospitalizations, and office visits (AHRQ, 2007).

Conceptual and Operation Definitions of Quantitative Study Variables

Table 1 presents the independent and proposed dependent variables used to measure the concepts of the Donabedian quality framework, with adaptation from the MOS conceptual framework related to MHH outcomes. These variables were part of the qualitative portion of this exploratory mixed-methods study. Other dependent variables—mental health visits, pharmacy prescriptions, and immunizations—were added based on the outcome in the qualitative phase.

Table 1

Conceptual and Operational Definitions of Independent and Dependent Variables

Conceptual definition	Independent variable	Operational definition
The structures of health care were the physical and organizational attributes of the health care settings (e.g., facilities, equipment, personnel, operational and financial processes supporting medical care (AHRQ, 2007; Donabedian, 2005). The processes of patient care were the modifications and activities performed to improve care delivery and coordination. Process relies on structure to provide resources and mechanisms for providers to carry out patient-care activities. (AHRQ, 2007).	Implementation of MHH: Section 2703 Medicaid Health Home, as defined in the ACA, provides the organizational structure and financial incentives to create a health care setting to address patients with complex health issues. The health home provided care to individuals with select behavioral-health and physical-health diagnoses, to provide enhanced access to care. This allowed the provider structure to better address and manage health care comorbid conditions (AHRQ, 2007; CMS, 2010), Donabedian, 2005; Tarlov et al., 1989). The health home process was the intervention that consisted of improved care delivery and enhanced care coordination. These were provided through a multidisciplinary team using a patient-centered approach specific to the beneficiary’s disease and health care needs consistent with the Donabedian quality framework (AHRQ, 2007; MDHHS, 2016a).	Michigan’s legislature appropriated MHH funding for FQHCs in the state that met the structure and process criteria outlined by the state Medicaid agency. There were 10 FQHCs that provided the core health-home services through the use of a multidisciplinary team. The FQHC health home team provided (a) comprehensive health care management, (b) care coordination and health promotion, (c) comprehensive transitional care from different health care settings, (d) patient and family support, (e) referral to community and social support services, and (f) use of health IT to link services (MDHHS, 2016b; CMS, 2013).

Conceptual definition	Independent variable	Operational definition
Health outcomes were the patient changes attributed to the health care intervention (AHRQ, 2007; Donabedian, 2005).	ER Visits: ER visits were services that occurred in the hospital outpatient ER setting that provided prompt treatment of acute illness, physical trauma, or other medical emergencies. Some visits were emergent and needed immediate medical attention, whereas others were considered nonemergent and could have been managed in the primary care setting (Antos, 2013; Cantor et al., 2014).	ER visits were measured through the review of paid claims data for emergent and nonemergent use of the ER. Only ER visits where services were provided were counted. ER visits were analyzed for individuals' pre- and postenrollment in the MHH model and for unenrolled individuals' pre- and post-MHH implementation in the comparison group.
	Hospital Admissions: Hospital admissions occurred when a patient's condition required inpatient hospital care. Patients were admitted to a hospital when they were extremely ill or had severe physical trauma (Bleich et al., 2015; Christensen et al., 2009).	A hospital admission was when an individual had a minimum of an overnight hospital stay to stabilize their condition. The patient met admission criteria to be included. Hospital admissions were identified by the diagnoses-related-group information through paid claims data and were analyzed for individual's pre- and post-MHH enrollment and for unenrolled individuals' pre- and post-MHH implementation in the comparison group.
	Office Visits: An office visit was an encounter or meeting between a patient and a physician, a physician assistant, or a nurse practitioner to obtain healthcare advice or treatment for either a behavioral-health or a physical-health condition (Pourat et al., 2016).	Office visits were obtained from paid claims data by looking for office-visit codes billed within 1 year before the individual enrolled into the MHH model and then comparing this number to the number of office visits received within 12 months post MHH enrollment. Office visits were identified for individual's pre- and post-MHH enrollment and for unenrolled individuals' pre- and post-MHH implementation in the comparison group.

Note. AHRQ = Agency for Health Care Research and Quality, MHH = Medicaid health home, ACA = Affordable Care Act, CMS = Centers for Medicare & Medicaid Services, MDHHS = Michigan Department of Health and Human Services, FQHC = federally qualified health centers, ER = emergency room.

Research Questions

The research included one qualitative question, three quantitative questions, and one mixed question. Information gleaned from answering the qualitative question was used to guide the quantitative study. The research questions used follow:

1. How do nurses perceive their MHH role to influence patients’ health-service use patterns?
2. What are the differences in ER use, hospital use, and the number of office visits for MHH patients pre- and post-MHH enrollment?
3. What are the differences in ER use, hospital use, and the number of office visits for unenrolled patients eligible for Michigan’s MHH pre- and post-MHH implementation?
4. Is there a difference in ER, hospital, and office-visit use between the MHH-enrolled group and the unenrolled MHH group before and after MHH implementation?
5. The overall mixed-methods research question was, how does the nurse’s role influence the patient’s health-service use and did use patterns change after MHH implementation?

Design

An exploratory mixed-method study design was used for this research. This study used a two-phase sequential design that started with qualitatively exploring the topic before moving toward the second quantitative phase. The linking of qualitative and quantitative approaches created a more comprehensive understanding than could be achieved by employing either method alone, thereby allowing greater insight into the area of research (as suggested by Creswell & Plano Clark, 2011; Fetters & Molina-Azorin, 2017).

The qualitative research design was conducted with a focus group and individual interviews with MHH nurses to better understand nurses' perceived role in relation to patient health-care-service use. Additionally, the qualitative method was used to verify the chosen quantitative dependent variables and to determine if other variables should be measured or if other additional areas of data exploration should be conducted (aligned with Creswell & Plano Clark, 2011). Data accrued through a qualitative inquiry with a focus group and individual interviews (Patton, 2015). Content analysis allowed for a subjective interpretation of the content of text data through a systematic classification process of coding to identify and count themes or patterns (as in Hsieh & Shannon, 2005). The first aim of the qualitative phase was to gain knowledge and understanding of how nurses perceived their role in an MHH model that manages the health care of individuals with chronic diseases.

Patient-service-use data from prior to the implementation of the MHH and post implementation of the MHH provided the quantitative component, whereas nurses' responses comprised the qualitative phase. The two groups compared for this research were the intervention population, consisting of individuals enrolled in the MHH, and the comparison population, consisting of individuals who were eligible for the MHH but chose not to enroll. Information from each research question was further analyzed to determine if differences emerged between the intervention group and the comparison group. The comparison group enabled analysis to determine if selected clinical outcomes were different for individuals who met eligibility criteria for the MHH, but chose not to enroll.

Examining the outcomes between the two groups provided information about the impact of the MHH. These data also allowed determination of alignment with the outcomes specific to Donabedian's quality framework, which indicates that structure and processes of care for improved care coordination can result in improved health outcomes, evidenced by decreased health-care-service-use patterns (Donabedian, 2005). The third aim of this study was to integrate the findings from the qualitative and the quantitative components to aid in understanding the impact of nurse's roles in a chronic-disease health home. Appendix B includes a schematic of the exploratory mixed-methods process and time line.

Methods

Sample for Qualitative Study

A total of 18 registered nurses from eight of the 10 MHHs in Michigan participated in the study. The qualitative phase included semistructured interviews with seven MHH nurses from seven different MHHs. One interview included two nurses in a face-to-face format and the remaining five interviews were conducted telephonically. The interviews lasted between 35 and 60 minutes. A focus group of 11 nurses took place at an MHH site. The focus group included a purposive sample of 11 MHH nurses, completed in 1.25 hours. In total, 18 nurses from eight different MHH sites participated in the qualitative phase that spanned a 10-week time period from mid-November 2017 through January 2018.

The registered nurses who participated in the interviews and the focus group were actively serving in an MHH as a nurse health care manager or case manager and had been working in this role for a minimum of 6 months. Nurse participants were recruited by e-mail and by working with the Michigan Primary Care Association (MPCA) staff, who interacted regularly with MHH staff. All focus group and individual phone interview participants received a $25 gift card from the researcher.

As of March 2018, a total of 3,640 patients had enrolled in the MHH. Health care staff were known as the MI Care Team (MDHHS, 2018b). Nurses participating in this qualitative phase worked at eight different health homes that collectively represented 96% of the patients enrolled in MHHs. Several attempts were made to contact nurses from the other two MHH sites, but none of the nurses responded. No further attempts were made to contact these nurses, as data saturation was reached.

Sample for the Quantitative Study

The MHH patient-sample population was divided into two groups: an intervention group and a comparison group. The intervention group included Medicaid enrollees who received care-coordination services through an MHH. Individuals in the intervention population were enrolled in Medicaid for a minimum of 12 months pre-MHH enrollment, and were also enrolled in the MHH for a minimum of 12 months after enrollment.

Individuals in the comparison group included Medicaid enrollees who met the MHH behavioral-health and physical-health diagnoses-eligibility criteria, but chose not to enroll. Patients were included if they had been Medicaid eligible for a minimum of 12 months pre- and post-MHH implementation. Once the number of individuals for the intervention group was identified, a sample of equal size was randomly selected from the total eligible comparison group.

All data used for the research came from Medicaid paid-claims data. These data were stored in the MDHHS data warehouse and were accessible through a data query. All of a Medicaid enrollee’s health services that were billed to the state were housed in the data warehouse, including all services provided in the ER, hospital, and office-visit settings. Therefore, recruiting individuals for this portion of this research was unnecessary. Including the entire eligible sample also increased the likelihood of the homogeneity of each group (Field, 2013).

To avoid a type II error, a power analysis using G*Power was used to determine the size of the convenience sample needed for this study (as in Faul, Erdfelder, Lang, & Buchner, 2007). Because decreasing ER use was central to MHH outcomes, this was the dependent variable with the effect size used to calculate the sample size. The pre intervention ER-use rate for an MHH in Iowa (0 = no ER visits/month and 1 ≥ 1 visit/month), the population mean, and the *SD* for individuals in an MHH (*M* = 0.08, *SD* = 0.267), were reviewed and compared to the regular Medicaid population (adjusted for age and program eligibility criteria, *M* = 0.03, *SD* 0.181), as reported by Shane et al. (2016). The researcher calculated an effect size of 0.22 using the formula for Cohen’s *d* (CMS 2013; Field, 2013). With a power of .80, alpha of .05, and an effect size (Cohen’s *d* = 0.22), a total sample of 514 (257 in each group) was needed to conduct paired-samples *t*-tests and independent *t*-tests to calculate within and between group outcome mean comparisons for the intervention and comparison groups (Field, 2013; Portney & Watkins, 2009).

The convenience-sampling approach included all individuals who met the intervention-group sample requirements, identifying a total of 437 individuals. This sample included all patients who enrolled in the MHH in July (*n* = 90), August (*n* = 114) and September (*n* = 233) of 2016 and met the pre- and continuous post enrollment requirements. This number exceeded the projected 257 needed for the study. The researcher included all eligible MHH patients in each month until the desired sample size was reached.

Individuals in the comparison group included Medicaid enrollees who met MHH eligibility criteria but chose not to enroll. The sample included those individuals who were Medicaid eligible for a minimum of 12 continuous months pre- and post-MHH implementation. The 10 MHH FQHCs provided care in 21 counties in Michigan; therefore, the comparison group was randomly selected from the same 21 counties. The random sample was computer generated using Microsoft Excel, assigning random numbers to each patient. Then the sample was drawn proportionally and randomly from the same counties as the intervention sample to assure the comparison population drew from similar geographical locations in various parts of the state. A total sample size of 437 was randomly selected from the total eligible comparison group of 8,343. The overall sample of 874 exceeded the 527 required sample; however, larger samples foster statistical-conclusion validity (Creswell, 2014). Individuals who had a Medicaid spend-down or had other insurance coverage were excluded from the sample.

To reduce data-abstraction-related bias, the comparison sample 12 months pre- and post implementation claim review was staggered to include claims data from the same timeframes as the intervention sample. Claim information used July (*n* = 90), August (*n* = 114), and September (*n* = 233) of 2016 as the base months to review pre- and post health-care-use patterns. The base month was the month in which claim activity was reviewed 12 months prior and is the first month included in the 12-month post implementation date. Every individual in the comparison sample met the pre- and 12-month continuous post enrollment requirements for the month they were assigned. Obtaining dependent variable data from the same timeframes helped ensure that any limitation associated with claim lag or other claim-related delays occurred equally to both groups.

Protection of Human Subjects

The Institutional Review Boards (IRBs) at The University of Texas at Tyler and the MDHHS approved the study proposal (see Appendices C and D). All nurses participating in the focus group or individual phone interviews signed a consent form prior to participating (see Appendix E).

Health-care-services data were analyzed in the aggregate and did not identify individuals specifically. No direct interaction with participants took place; therefore, no consent was required. Health Insurance Portability and Accountability Act (HIPAA) of 1996 guidelines were followed to assure participants' rights were protected. This included deidentifying data so health information would not identify or provide any reasonable basis to identify a person, which in turn removed the restrictions on the use or need for disclosure of such health information (U.S. Department of Health and Human Services [USDHHS], 2016b). By following HIPAA's data-use operational guidelines, MDHHS was able to provide the data needed for this research as it was considered part of department operations (USDHHS, 2016a). The researcher completed and submitted a data-use agreement with MDHHS staff for review and approval. Once the data-use agreement was approved, the researcher was able to access the data (C. Green-Edwards, personal communication, August 1, 2017),

Instruments

The data used for this research study accrued from the MDHHS data warehouse. The data warehouse was the centralized repository of the historical paid-claims data, as well as other public health data used to support state agencies' business processes. The state extracted data from various systems, transformed the data into the proper format, and loaded it into the data warehouse. State agency staff used analytical tools to query data stored in the data warehouse to generate state and federal reports, perform trend reports, and evaluate claims data (Green-Edwards, n.d.). Data were queried from the data warehouse; therefore, no instrument was needed for the study.

Data-Collection Procedures

Qualitative

Data collection began, following IRB approval. The data accrued through semistructured, open-ended focus-group interviews and individual interviews with MHH nurses, then analyzed using inductive content analysis. All focus-group members received information about the purpose of the study verbally and in writing, prior to the meeting start. Participation was voluntary. All participants were assured they would remain anonymous. Written informed consent was obtained prior to the study (Patton, 2015; Shorideh, Ashktorab, & Yaghmaei, 2012). The session was audio-recorded and transcribed verbatim. Individuals had the opportunity to submit an idea or a response by writing it down and handing it to the researcher while the focus group was in progress.

This helped assure participants could submit their thoughts in the event they did not feel comfortable voicing their opinion. Two nurses in the focus group exercised this option.

Individual interviews were completed telephonically and in person. Interviews were audio-recorded and transcribed verbatim. The same interview questions were used for the focus group and the individual interviews (see Appendix F).

Quantitative

Data collection began after IRB approval and after the researcher received a signed MDHHS data-use agreement (see Appendices D and G). The data used for the quantitative phase of the research study were obtained from the MDHHS data warehouse. The query used to pull paid claims data for ER visits, hospital admissions, and office visits was the same query used for the intervention group and the comparison group. This assured the same process was used to obtain data for the both groups. In addition, the data were pulled on the same day for both groups to assure the data were consistent and to equalize validity and reliability of data to be analyzed (Green-Edwards, n.d.). Every individual in each group had 12 months of data pre- and post-MHH implementation included in the analysis. The dependent variable data was pulled from the 12 months preceding the MHH enrollment date for the intervention group or from the assigned month for the comparison group (e.g., if an individual was assigned or enrolled in September of 2016, data from September 2015 through August 2016 were included) and compared to what happened 12 months after (e.g., data from September 2016 through August 2017).

The ER-visit data were abstracted by identifying claims with revenue codes 450–459; hospitalization data were abstracted by identifying claims with any diagnostic related group data; and office-visit data included claims with any of the current procedural terminology office-visit codes identified in Appendix H (MDHHS, 2017b). Demographic information—age, race, gender, county of residence in Michigan, and Medicaid program eligibility—was collected. Additionally, risk-score information was collected. Risk scores were calculated for individuals who were eligible for the MHH. Scores were calculated by (a) factoring and weighting diagnoses recorded on a medical claim, (b) episodes of care that included unique occurrences of a medical condition or a disease and the health-care services involved in diagnosing and managing the health-care treatment, (c) pharmaceutical use, and (d) patient age. Risk scores allowed for a comparison of risk between members and was a measure of relative resources expected to be required for their medical care. The higher the risk score, the greater the need for health-care resources. A relatively small number of high-risk individuals consume medical resources. Consistent methodology was used to calculate risk across all populations (OptumInsight, 2016).

Analysis

Qualitative Method

Content analysis was used to analyze nurses' perceptions of their role in an MHH in improving health-service-use outcomes with the information obtained from the focus group, the individual interviews, and information submitted in writing from the nurses. The interviews and the focus-group conversation were recorded and transcribed verbatim. Transcripts were rechecked by playing the tape and assuring the recorded text matched what was stated, in an effort to verify findings.

The researcher identified information related to nursing perceptions and their role in a health home and information related to the impact on the dependent variables. The text was highlighted and then moved to a separate document where the text was grouped by nursing perceptions and dependent-variable impact. The large quantities of nursing-perception text were organized into categories and analyzed to identify themes common to the nurse's role. In total, six themes emerged. The themes were labeled and quotations grouped to allow further analysis in determining relationships between categories (Graneheim & Lundman, 2004; Hsieh & Shannon, 2005). Themes were consistent between the interviews and the focus group.

Text related to the dependent variables and the nurses' predictions of what would happen were categorized by each variable. Three additional categories were added: mental health visits, pharmacy prescriptions, and immunizations. The dependent-variable categories were subdivided to provide information indicating opposing viewpoints, where applicable. The researcher's interpretations and potential policy impacts were added to the analysis results. The data obtained from the qualitative sources were used to verify and explain the quantitative results (as suggested by Creswell & Plano Clark, 2011).

The information was summarized for each theme and included several quotations that highlighted each theme. The qualitative information pertaining to the dependent variable information was also reviewed. Although the nurses confirmed and supported the analysis of the suggested dependent variables, the direction of the predicted results varied and included opposing viewpoints that were included in the results. For example, some nurses indicated hospitalizations would increase, whereas other nurses indicated hospitalizations would decrease. Both viewpoints and their rationales are reported. Nurses suggested additional dependent variables (Creswell & Plano Clark, 2011).

The results were compiled and reviewed in a face-to-face meeting with an experienced qualitative researcher. The processes of collecting information, categorizing and organizing the text, identifying themes, verifying the dependent variables, and presentation of the information were discussed. The qualitative researcher verified that the approach was sound and the themes derived from the analysis were appropriate. Some suggestions included how to address nurses' quotation that fit into more than one theme.

Next, the researcher contacted the MHH nurse participants and provided them with an opportunity to review and verify the research findings, which was an important process to help increase study credibility (Kim, 2011; Koch, 2006; Patton, 2015). The information was e-mailed to the 18 MHH nurses who were asked to assure the information presented reflected their thinking and what they stated. They were given 3 weeks to complete this process and several nurses responded to confirm the accuracy of the information. Three nurses verified that the themes identified were appropriate and accurate. Nurses provided no comments or suggested changes.

Quantitative Method

Data related to demographics and the dependent variables were queried from the MDHHS data warehouse 18 months post-MHH implementation. This information was used to identify population characteristics and was included in the results to produce descriptive statistics about the study sample and measures (Portney & Watkins, 2009). After the data were queried from the MDHHS data warehouse, they were stored in an Excel format on a BitLocker password-protected flash drive. The data were reviewed, deidentified by assigning numbers to each individual, and cleaned. Although the data were deidentified, the researcher ensured HIPAA guidelines were followed (USDHHS, 2016b).

Each data variable was analyzed to determine if parametric assumptions were met, and depending on the outcome of meeting these assumptions, the appropriate statistical test was performed for within-group and between-group comparisons. The statistical analysis was completed using SPSS with a 95% confidence interval. The Excel data file was imported into SPSS and saved in a SPSS file format to enable running various statistical tests (Field, 2013).

The research question for this study was designed to determine if a difference emerged between ER, hospital, and office-visit rates between the intervention group and the comparison group and in the intervention group and comparison group pre- and post-MHH implementation. The dependent variables, which included ER visits, inpatient hospitalizations, and office visits (mental health office visits were added after the qualitative study), were all continuous variables. The chi-square and binomial tests were used to analyze categorical demographic data and additional independent *t*-tests were used to analyze continuous demographic data (Portney & Watkins, 2009). In the event the parametric assumptions were not met, a Wilcoxon Signed-Ranks Tests or a Mann–Whitney U test was used and reported as appropriate (Field, 2013). Pharmacy data were also collected and descriptive information was provided.

Integration

The qualitative findings were used to determine the final dependent variables of the quantitative component. Once the statistical analysis was completed on the dependent variables, the information was reported, along with the salient qualitative findings that provided further insight into the quantitative results. The qualitative findings were used to help further understand why a certain variable may have increased or decreased. These findings depict the integration of results from both methods (as in Creswell & Plano Clark, 2011). Appendix B provides a procedural diagram of the study and how the information was triangulated and integrated.

Procedures to Enhance Control and Rigor

When conducting a qualitative study, it is important that researchers clearly describe how they identified themes and how they built and applied codes to support study rigor. The researcher completed the following to assure a rigorous analysis was completed. First, the researcher comprehensively explored as much data related to qualitative technique as possible. This exploration was completed by assuring that nurses from eight of the 10 FQHC MHHs were included in either the focus group or individual interviews. Interviews were conducted before and after the focus group and continued until the researcher achieved information saturation. The researcher completed member checking to assure all participants in the qualitative study were nurses in an MHH for a minimum of 6 months.

Second, the researcher sent the findings of the qualitative study to all participants to allow them to provide input and confirmation. After the findings were confirmed by participants, the researcher sought input from external experts, which included MDHHS staff who worked on the MHH project and staff from the MPCA. The MPCA represents the FQHCs in business matters and partnered with MDHHS to implement the program. MDHHS and MPCA staff agreed with the findings and offered suggestions to improve program outcomes. Third, the researcher merged the information provided from all sources and reported confirming and disconfirming evidence (Creswell, 2014).

For the quantitative component, data were abstracted the same day for the comparison and intervention groups to assure the data had an equal chance of being updated. Data elements were abstracted well after MHH implementation to account for issues related to claim lag. The MDHHS data warehouse was updated daily as Medicaid-paid claims were adjudicated daily (Green-Edwards, n.d.).

These data also included a comparison group of individuals not enrolled in an MHH to account for any concurrent trends in health-care use that would not be attributable to the MHH nurse health-care-management experience. This process helped to address confounding factors related to changes made as a result of health-care patterns occurring outside of the MHH (Creswell, 2014). In addition, analysis of demographic data was conducted to compare and contrast key attributes, such as age and gender, to assure major differences did not arise between the intervention and the comparison group. This process helped address threats to internal validity (Creswell, 2014).

Qualitative Component

The exploratory sequential mixed-methods design was a two-phase design that started with completing a qualitative study and collecting information to build or reframe the quantitative part of the study (Creswell & Plano-Clark, 2011). The qualitative component was designed to address the following two research questions:

1. How do nurses perceive their MHH role to influence patient healthcare service use?

2. How does the nurse’s role influence the patient’s health-service use and did use patterns change after MHH implementation?

The first aim of the qualitative phase was to gain knowledge and understanding of how nurses perceived their role in the MHH model. The second aim was to confirm the dependent variables and to determine if additional variables should be added. The researcher used the qualitative information obtained to (a) identify common themes related to the nurse’s role, (b) confirm the importance of the dependent variables to be used for the quantitative study, (c) understand how and why the variable outcomes may be influenced by the nurse’s role, and (d) determine if other variables should be evaluated.

Six Common Themes

Analysis of data generated from the nurse interviews and the focus group yielded six themes that were common to nurses’ perceived role to impact patients’ health care use of services.

Theme 1: Establishing Trust and Building Relationships

Several nurses commented that the MHH model allowed them the time to establish relationships with their patients. They believed that patients were able to form a trust or a bond with staff and they talked to them for lengthy periods of time. Through these conversations, an MHH nurse was able “to find out where they are at. … They have a connection, or they are making a connection.” The nurses recognized that establishing relationships included using culturally appropriate language, proper etiquette, having more time to make the patient feel safe, following through on phone calls, making appointments, and building support. The staff did not feel rushed to get the patients through, as the MHH model provides financial support to take time for form relationships.

The nurses tried to understand what patients may have been experiencing and worked with them if they did not always make it to an appointment in a timely manner. “If they are late to an appointment or need to be seen right away, we don’t turn them away.” The nurse added that sometimes a patient had to take a bus to attend an appointment and it was understandable that a patient could have missed a bus and had to wait a period of time for the next one to come. Establishing relationships can have a direct impact on how patients identify health issues and how they use the health care system (Last, 2015). One nurse recalled a patient who was suicidal, in the ER with ketoacidosis frequently, and had neuropathy. This patient would only talk to certain people at the clinic. When the patient said he was “not feeling well,” he really meant he was suicidal. The nurse quickly recognized a cultural and a language barrier in the process of establishing a relationship with the patient. With improved communication, the nurse screened him for severe depression and worked collaboratively to establish a treatment plan. He talks to the nurse once a month or more often if he is “not feeling well.” He has not had an ER visit since. Other nurses stated the following:

> We had to work on openness, you know everyone has a story that we need to understand.
>
> They are reaching out to us than they’re letting us know how they’re doing and they trust us.
>
> It goes back to prioritization, which is what we are taught to do. If someone comes in and they are homeless, they don’t even have a place to store insulin let alone manage their diabetes. It is not a good use of time to teach them how to store their insulin.

> They know there are a lot of issues going on and they don’t have time to figure it out. They ask us to talk to them and try to figure out what is going on. We form those relationships and find out what is going on.
>
> Some patients are more willing to open up to the nurses. They have a different relationship with the nurses than with the doctors. … We are more approachable then other providers. There are some factors that make them more comfortable with us than the doctors.
>
> I want patients to feel more comfortable, then they will feel more comfortable and they will open up more to me.
>
> We try to understand where people are coming from and the difficulties they face.
>
> Patients are really different. Some will come in for everything and others won’t.

Theme 2: Listening to the Patient

The nurses indicated that the MHH structure provided them the opportunity to spend time with patients, get to know them, and listen to them. The following quotations from the nurses describe their ability and experience when listening to patients.

> If we listen, we can hear everything that is going on. Then we can go forward to help them to manage their care.
>
> It allows us the opportunity to talk to the patient to see what they need, to see what they actually can do, and where they are.
>
> I’ve had someone say ‘oh my gosh, thank you for listening to me’ because nobody ever listens to me.
>
> Helps us understand why things are what they are, why are the patients not doing something. Like not taking meds, it could be they just cannot get to the pharmacy.
>
> We have to meet the patient where they are at.
>
> They’re focusing on what is the most important thing.

Theme 3: Patient Engagement and Goal Setting

The MHH nurses stressed the need to approach chronic conditions from a holistic perspective and to consider other nonmedical factors, such as social determinants of health, when setting up a treatment plan. This was evident when a nurse stated, “Sometimes what we think the patient needs to do isn’t what they need to do.”

Working on a multidisciplinary team and managing the health care of these patients can help identify and address barriers to care. Health-home nurses recognized this theme as a process and indicated the following:

> They have to take initiative and be responsible for themselves, because we will enable them if we continue to tell them what to do and try to tell them to do it.
>
> We need to find out what’s the number one thing right now that is important to the patient, because that is what we need to do. What’s important to them?
>
> We focus on the work the patient is doing and empowering them.
>
> We do goal setting with our patients. We are able to sit down with them and hear from the patients what their concerns are and we can agree with them together as to what the next thing is to work on. Sometimes the goal is as simple as attending the next MI Care Team visit or picking up the phone when the MI Care Team calls. As time goes on we can start to address other concerns. Definitely picking one concern at a time and prioritizing and getting that next thing done and then going from there. That is really helpful for patients.
>
> They’re coming in every three months [for hypertension follow-up].
>
> Before it’s not coming to the doctor’s office at all and just going to the ER, now they’re coming to the doctor’s office, they’re getting their hypertension and diabetes follow up, or their COPD follow-up.
>
> Keeping the goals obtainable. They don’t want to be set up for failure.
>
> Small goals can be huge for people.
>
> If there is a lot going on with a patient, you have to break it down. Start small. We have to individually work with patients to determine if they can handle multiple goals or if they can only do small goals.

The nurses further stated that they work hard to support patients and focus on self-management goals. They keep goals obtainable, recognize when patients are working hard, celebrate minor successes, and make sure they do not set individuals up for failure.

A nurse provided an example of how engaging a patient and setting realistic goals resulted in a change. The nurse explained,

> We had a patient who smoked two packs per day, she got down to two cigarettes per day. She was upset with herself that she could not stop. She had a very stressful home life. We said that two cigarettes is much better than two packs per day. We have to keep the expectations realistic. If they fail, they will lose the motivation to improve their health or do anything. We use small increments and lots of positive feedback … you can't do too much. You know, you have to make sure they are ready.

The MI Care Team nurse assessed the patient's needs and planned the next visit with all of the appropriate individuals who needed to help manage the patient's health care. This promoted efficient use of the provider's and patient's time.

Theme 4: Direct Access to and Contact with the Nurse

Many nurses commented on the importance of being available, or for patients being able to reach them when needed. They believed patients were willing to be open with them and would call if they could have direct contact. Several MHH nurses provided patients with their direct number, which saved the patients the time from having to go through the call tree before they could speak to someone. The nurses mentioned the following regarding giving out a direct number:

> We make sure that they have the phone number if they have any questions. We tell them that you can call this number, it is my direct line ... It rings directly to me.
>
> Patients do call us, like, and they know that they have a contact at the doctor's office. They like someone that they can call.
>
> Instead of going to the ER we're asking them to call our office first. We tell them don't go to the urgent care or ER when you get strep throat. Give us a call first. We have same day appointments if you call, you know we can get you in.
>
> Being available immediately by phone, rather than having to go through the call center is really helpful to encourage our patients to touch base with us before they are going to make a decision to go to make an appointment or go to the ER.

One of the nurses had established a good relationship with an enrolled MI Care Team patient. When they began discussing the patient MI Care Team benefits with the spouse of the enrolled patient, the spouse, who also had chronic conditions, wanted to know if she was eligible for the MI Care Team. She liked the program and stated “I want my own nurse.”

It is important to note that some of the nurses indicated that providing a direct contact was not always feasible. If a patient called them and left a message, they had a concern that the nurse might have been out of the office for a few days and would not respond to the message in a timely manner. Some clinics did not provide this direct access.

Theme 5: Addressing Social Determinants of Health

Issues related to social determinants of health were mentioned in all seven nurse interviews and the focus group. Managing related health care issues became part of the equation for providing holistic care. Nursing comments related to the social determinants of health and how having a team approach to solve issues was key.

> Social determinants has a big impact on our patients.
>
> Oh my gosh social determinants! There you go. You know and that has a huge impact on our patients.
>
> We have decreased homelessness and many people feel they are safe.
>
> We provide them with any help or resources, food pantries anything that can help them with their chronic condition.
>
> We have the right people on the team to take care of their problem … we have the community health worker and we have a social worker that also has that critical piece to connect with resources. It is wonderful having a team that you work together with because they bring things to the table that I can’t.

> We do the education but we also find out why. Why it’s not working. Because if a patient is homeless, guess what? They’re not going to care about their diabetes no matter what we do. That doesn’t matter.

Theme 6: Education

All of the nurses indicated that the MHH allowed them more time to educate patients and how important this has been for them. This was especially true in managing health care for individuals with a behavioral health condition that needed additional attention. Furthermore, education was not limited to the patient; it also included educating providers about the patient’s issues. The nurses stated the following:

> We have patients who just need teaching, some patients need a lot of teaching.
>
> Take the time to tell patients how important it (preventive care service) is.
>
> Make sure that you understand everything that we’re doing and we’re talking about.
>
> We are able to spend more time and get down to their level. We are able to educate the community health workers and the providers as to what the barriers are … as to what the patient is seeing.
>
> Patients with asthma and diabetes don’t have the education, but the MI Care Team provides them with education, goes over their medication list, and helps with doctor follow-up.
>
> You know, [a patient] and I actually met for a medication reconciliation and it turns out he was not really taking very many of his medications because he did not know what they were. He had quite a few that were expired and were sitting around for a long time. We went through and organized them and he felt a lot better about knowing what he needed to take. He began taking them. That was helpful to address some of his concerns.
>
> Lots of education. We have incorporated a lot of healthy lifestyle programs and other classes that are geared towards diabetes or healthy eating or exercising classes as well. Those have been really helpful to quite a few of our patients. Especially those who enjoy being engaged.
>
> The opportunity to teach, I like the one-on-one with diabetes teaching.
>
> We get a lot more information when we are with those patients, we are with them a lot longer. We can bring this back and help to create a plan that will work for

> them. We can individualize care a lot better. We go through their meds and look at prescription refills and make sure they have what they need. If they have a med on the med list, the providers think they are taking it. Then we talk to them and find out that they are not taking the medications or have not had the prescription filled in a long time. It opens up an opportunity for education. Then we go back to the provider and let them know what we had found. We can spend more time with the patients. Then we go back to the provider and tell them what is needed and they can add that to their plan.

A number of nurses highlighted education of the team and educating the physician about the patient. The MI Care Team provided the nurse with additional resources to impact patient care. It includes advocating for patients with a chronic condition to other members of the health care team, which seemed to have a positive impact on patient care.

Nursing Role

Defining the nurse's role in the MHH was challenging as the nurse must identify and adapt to the patient's issues to effectively work with them in managing their health care conditions. Primary themes focused on taking the time to connect with the patient and thereby influence patient behavior change. The nurses also commented further as to how they saw their role from an overarching perspective and how the MHH model allowed them to provide enhanced care-coordination services.

> The nurse, we are the liaison between the patient, the community and the provider. Helping the patient to understand the provider when the patient perceives they are not being understood or not receiving what they are entitled too. Or when the patient feels they are not receiving a certain type of service.
>
> It is being able to slow down and give that personal touch for our patients who may be rushed through their regular office visit. For us as nurses in the health home model, we are able to really slow down and hear their story. Hear why they're struggling to meet some of our expectations of them or why they are not hearing or why they are not able to reach their optimal health goals. To hear what their barriers are and to address them.
>
> We had a patient come in who was in her mid-forties. Her HgbA1c was 12.9 in September 2016. She did not know what to eat or how to exercise. She came in twice a week. We set up meal plans and a food journal and types of exercises …

> by March of 2017, her HgbA1c was down to 7.1 with just diet and exercise. She was very motivated.

Quantitative Component

The qualitative portion of the exploratory mixed-methods study was used to determine if the dependent variables identified for the quantitative research were appropriate to analyze, what impact the nurse's role in the MHH would have on the dependent variables, and to determine if other dependent variables should be considered as part of this study. The research questions that pertained to the quantitative study were the following:

1. Is there a difference in ER, hospital, and office-visit use for MHH patients before and after MHH enrollment?
2. Is there a difference in ER, hospital, and office-visit use for unenrolled MHH patients before and after MHH implementation?
3. Is there a difference in ER, hospital, and office-visit use between the MHH enrolled group and the unenrolled MHH group before and after MHH implementation?

The three dependent variables discussed included ER visits, inpatient hospital stays, and office visits. The nurses provided feedback on these variables and suggested several other variables of their role that they believed impacted the outcome. The nurses' responses to each dependent variable and why they believed the rates would change are integrated with the following quantitative findings. Table 2 contains the descriptive statistics for both groups.

Table 2

Population Descriptive Statistics

	Intervention group _N_ = 437				Comparison group _N_ = 437				Between group sig.(2-tailed)
Variable	_M_	_SD_	_n_	%	_M_	_SD_	_n_	%	
Age	48.07	9.46			44.23	11.61			*_p = .000_
Minimum	20				18				
Maximum	63				63				
Gender									
Male			135	30.89			147	33.64	**_p = .385_
Female			302	69.11			290	66.36	**_p = .385_
Within group by gender									
Sig.(2-tailed)	***_p = .000_				***_p = .000_				
Race									**_p_ = .931
White			223	51.03			215	49.20	
Black			169	38.67			172	39.36	
Hispanic			18	4.12			22	5.03	
Native American			3	0.69			2	0.46	
Other			24	5.49			26	5.95	
Risk score	5.74	4.89			4.77	3.87			*_p_ = .001
Minimum	0.50				0.11				
Maximum	44.47				39.59				

Note. *Independent _t_-test, **Pearson's chi-square, ***Binomial test.

Assumption testing for the age variable sample indicated the data were normally distributed. The intervention and comparison age-group descriptive statistics (intervention group skewness = -.612 and kurtosis = -.219, comparison group skewness = -.370, and kurtosis = -.875) and review of the histograms for both groups indicated the data were normally distributed. An independent _t_-test was performed and indicated that the age of individuals in the intervention group (_M_ = 48.07, _SD_ = 9.46) was significantly higher than the age of the comparison group (*M* = 44.23, *SD* = 11.61); *t*(837.82) = -5.36, *p* = .000. The results were corrected for nonequal variance.

A binomial test was performed to determine if a difference in gender emerged in each group. Results indicated a significant difference in gender in both groups (intervention group = χ^2 (1) = 437, *p* = .000, comparison group = χ^2 (1) = 437, *p* = .000). A chi-square test revealed no significant differences between the intervention and comparison groups by gender χ^2 (4) = 874, *p* = .385. Both groups had a higher percentage of women (intervention group 69.11% female, comparison group 66.36% female) in the sample. Analysis of race data between groups was completed using a chi-square test. The results show no difference by race between the groups χ^2 (4) = 874, *p = .931.*

Assumption testing for risk scores by group indicated the data were not normally distributed. Risk scores for the intervention and comparison groups (intervention-group skewness = 3.40, kurtosis = 16.50, comparison-group skewness = 2.87, kurtosis = 16.72) and the risk score histograms for both populations were positively skewed and leptokurtic. Although the assumption of normal distribution was not met, a parametric *t*-test was performed to determine if a significant difference arose. An independent *t*-test indicated that the risk score of patients in the intervention group (*M* = 5.74, *SD* = 4.88) was significantly higher than the risk score of the comparison group (*M* = 4.77, *SD* = 3.89); *t*(872) = -3.25, *p* = .001. Results confirmed a nonsignificant Levene's test (*p* > .05) for risk score, supporting that the assumption of equal variance was met. These findings were important to note, as the intervention group was older and had a higher level of health care use than the comparison group. This would suggest that the intervention group had a higher level of disease acuity.

Emergency-Room Use

The nurses who participated in the focus group and interviews agreed that looking at ER use was a good idea. They believed that the health home influenced ER rates for patients, but were not sure if results would be noted in the first year of health-home operations. Table 3 provides the findings.

Table 3

Emergency Room Utilization

	Intervention group (*n* = 436)			Comparison group (*n* = 436)			Difference Between groups sig.(2-tailed)
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	
Total ER visits before	1,010	2.32	3.93	1,286	2.95	4.99	***p* = .336
Minimum	0			0			
Maximum	50			49			
Total ER visits after	983	2.27	4.14	1,247	2.86	4.59	***p* = .004
Minimum	0			0			
Maximum	46			45			
Difference within group sig.(2-tailed)		**p* = .042			**p* = .872		

Note. ER = emergency room, *Wilcoxon Signed-Ranks Test, **Mann–Whitney U.

The ER data were not normally distributed, as evidenced by visual inspection of the data displayed in the histograms and the skewness and kurtosis data. The histograms were positively skewed and leptokurtic. The descriptive statistics indicated outliers in each group. The researcher removed all cases with greater than 50 ER visits before MHH implementation. This resulted in the removal of one individual from both groups before performing statistical analysis of the ER dependent variable. A Wilcoxon Signed-Ranks test indicated that post-MHH implementation ER scores for the intervention group were significantly lower than pre-MHH implementation scores $Z = -2.03$, $p = .042$. The comparison group pre- and post-ER rates were not significantly different $Z = -.259$, $p = .872$.

No statistical difference emerged between the pre-MHH ER-visit rates between groups. However, a Mann–Whitney U test indicated that the MHH intervention group post-ER visits (*Mdn* = 1) were less than the comparison group post-ER visits (*Mdn* = 1), $U = 84707.5$, $p = .004$.

Overall, nurses thought ER visits would decrease, but they were not sure what length of time it would take before a reduction would be realized. They felt that for some patients, it took a significant amount of education to change behavior or they had to learn why the patient was using the ER frequently before they were successful in impacting their use patterns. The changes were often individualized to the patient's circumstance and not a population issue. Some nurses commented regarding their ER-reduction success stories by stating the following:

> We become the go to person to call rather than go to the emergency room.
>
> The team has definitely improved the access, improved primary care. Less ER and less inpatient utilization. We have done this by empowering the patients.
>
> ER will go down and office visits will go up because now we have them coming into the office instead.
>
> Some just go to the ER and don't call; it becomes another reason why they're going to the ER. We had one person who was going to the ER because he gets a free sandwich...now we know that we have a food problem for him. So then you know what we did? We got him set up with meals on wheels … You know what is funny, it was as simple as that, but we didn't know unless we ask.
>
> One patient did not have family and went to the ER because they did not want to be home alone. They were homeless, so they *[MI Care Team members]* provided them with housing resources and a food pantry, and gave them a bus stop ticket so they can come to clinic if they are in any pain or if they needed help with

> something. It is more than just the chronic conditions. There are problems at home and that all tends to lead to why they cannot manage their chronic conditions and maintain them or the outcomes. There are other problems that they are dealing with that are stopping them from managing their chronic conditions.

Although some success was seen in the first year of implementation, some nurses expressed concern about not being able to make an impact on a patient's ER use. They commented that they were still trying to figure out how to address this issue. The following statements provided additional information about what nurses were experiencing in the clinical setting regarding some patients with whom they were still working to reduce ER usage.

> We try to educate them, but then they still go to the ER right after. They keep going to the ER all of the time. We are still struggling with that to figure out what we can do in those instances.
>
> We have several patients that we have tried to educate several times about their ER use. We check with them to make sure they don't go to the ER and then they come in and see us. Then after, they go to the ER as soon as they see us.
>
> We talk about appropriateness of using the ER, but I think it could be a cultural thing. Their families always went to the ER, so they do too. They just want to go to the ER to get it taken care of.
>
> A lot of our patients will still go for a simple cold. They want medicine and they want it right now. They don't think about the insurance aspect. If you know you don't have a co-pay and your office is closed, you will go and be treated. If they know they don't have to pay out of pocket, they will just go. The ambulance won't take them to urgent care, but they will take them to the ER.
>
> We had a patient with *[medical condition]*, so I made a same day appointment for her. Two hours later she left a message saying 'I have to take care of my dog first, and then I will just go to the ER after. She canceled her appointment.
>
> Several patients go the ER for blood pressure medication refills and that is not necessarily something that you should use the ER for. They need more work on behavioral health. It is hard to work with the high ER utilizers. The issue is sometimes beyond what we as nurses can do.

Despite the challenges the nurses and the MHH health care team face with high ER users, they continued to search for and identify ways to reach patients in changing their health care behavior. The MHH also used electronic data sources to facilitate their outreach and educational efforts. One MHH nurse coordinator put together a one-page flyer that had a list of reasons why someone should go to the ER, reasons why someone should go in for an office visit, and reasons why someone go to urgent care. The health-home staff targeted all people who had six or more ER visits in the last 18 months.

Inpatient Hospitalizations

The nurses agreed that looking at inpatient-hospitalization (IPH) use would be interesting and a good idea. They felt that the MHH influenced IPH rates for patients, but were not sure if results would be noted in the first year of the health home. Table 4 provides information related IPH statistics.

Table 4

Inpatient Hospitalization Utilization

	Intervention group (*n* = 437)			Comparison group (*n* = 437)			Difference Between groups sig.(2-tailed)
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	
Total IPH visits before	160	0.37	0.84	154	0.35	0.78	***p* = .724
Minimum	0			0			
Maximum	7			8			
Total IPH visits after	145	0.33	0.88	152	0.35	0.87	***p* = .307
Minimum	0			0			
Maximum	6			7			
Difference within group sig.(2-tailed)		**p* = .387			**p* = .971		

Note. IPH = inpatient hospitalization, *Wilcoxon Signed-Ranks Test, **Mann Whitney U.

The IPH data were not normally distributed, evidenced by visual inspection of the data displayed in the histograms and the skewness and kurtosis data. The histograms were positively skewed and leptokurtic. A Wilcoxon Signed-Ranks test result indicated that the intervention group's pre- and post-IPH rates were not significantly different $Z = -0.836$, $p = .387$. The comparison group's pre- and post-IPH rates were not significantly different $Z = -0.036$, $p = .971$. Although statistically no difference emerged between the two groups pre- and postimplementation, it was noteworthy that 15 fewer inpatient hospitalizations took place for the intervention group when compared to only two fewer in the comparison group. This was important as the intervention group had a higher mean risk score and was older than the comparison group. This was an area of study that should be evaluated over a longer period of time.

When nurses were asked about inpatient-hospital use and their impact on patient behavior, they had mixed responses. Nurses indicated that hospitalizations related to disease exacerbations should go down; however, they felt that patients had some pent-up demand for elective hospitalizations. IPH pent-up demand refers to instances where a patient needs an elective health care procedure requiring an inpatient stay, but something is preventing them from having the procedure. Reasons such as lack of health care coverage or the patient is not medically stable can cause a delay in receiving the necessary elective inpatient procedure. It stands to reason that IPH may fluctuate based on a number of circumstances. The nurses' IPH-related comments included the following:

> This is okay to look at, most of the time people go to the hospital it is for a good reason. Not much here. Unless it is related to poor monitoring.
>
> If they don't have to go into the hospital, they won't.
>
> We have partnered them up with people to decrease their anxiety after surgery. They are afraid of the way they may be treated in the hospital.

> Look at preventable versus elective if you can. [Some nurses felt there was some pent up demand.]
>
> Inpatient typically starts with an ER visit and then they go inpatient. So if we can decrease those ER visits, we can decrease the inpatient as well.
>
> Inpatient stays have decreased because we are making frequent contacts with patients. Instead of them sitting at home feeling sick, we have been calling them and if they are sick, we have them come in and take care of things before it gets worse. I think this has helped to decrease inpatient stays.
>
> We have a couple of patients that their goals are to decrease their HgbA1Cs so they can have their elective procedures done.
>
> Follow-up from the admission is really crucial to try to make sure that if they do go to the hospital we have a connection when they have an ER visit and inpatient visit. If they're inpatient with *[a local hospital]* we are connected to their electronic medical records and we can pull it up now.

Office Visits

All the nurses agreed that looking at office visit information was important. Most nurses thought the number of office visits would probably increase. Many nurses suggested conducting a separate analysis of mental health-related visits when seeing a social worker. When looking at physician office visits and mental health office visits, data were pulled to identify the number of current procedural terminology codes completed. A list of codes used for the data-abstraction process can be found in Appendix H.

Table 5

Office Visit (OV) Visit Use

Variable	Intervention group (*n* = 437) *n*	*M*	*SD*	Comparison group (*n* = 437) *n*	*M*	*SD*	Difference Between groups sig.(2-tailed)
Total OV before	5,570	12.75	7.50	3,874	8.86	6.62	***p* = .000
Minimum	0			0			
Maximum	46			39			
Total OV after	5,928	13.57	8.00	3,992	9.14	6.43	***p* = .000
Minimum	1			0			
Maximum	53			35			
Difference within group sig.(2-tailed)		**p* = .013			**p* = .341		

Note. OV- office visit, *Independent *t*-test, **Paired samples *t*-test.

The office-visit data and the mental health office-visit data were not normally distributed, evidenced by visual inspection of the histograms and the skewness and kurtosis data. The histograms were positively skewed and leptokurtic. Although the data from neither the intervention group nor the comparison group were normally distributed, a paired samples *t*-test was performed. In the intervention group, a paired samples *t*-test indicated a significant increase in the number of office visits completed after MHH implementation (*M* = 13.57, *SD* = 8.00) compared to before implementation [(*M* = 12.75, *SD* = 7.50); *t*(436) = -2.50, *p* = .013]. Conversely, in the comparison group, a paired samples *t*-test indicated no differences in office visit frequency (before implementation *M* = 8.86, *SD* = 6.62 and, after implementation [*M* = 9.14, *SD* = 6.43; *t*(436) = .954, *p* = .341]. This outcome suggests intervention-group patients had greater access to care and increased health care management in the physician's office than the comparison group. Nurses indicated that patients tend to come into the office for disease health care management follow-up more consistently or were more apt to come into the office rather than going to the ER. After improved chronic-health-care management occurs with the patient, reevaluating this dependent variable would be of interest to determine if the frequency of office visits declines over time.

Another interesting finding was that the number of ER visits was higher in the comparison group (*M* = 2.86), whereas the number of office visits (*M* = 9.14) was lower. These same dependent variables have opposite outcomes for the intervention group in that the number ER visits (*M* = 2.27) were lower, whereas the number of office visits (*M* = 13.57) were higher. This outcome aligned with what the nurses predicted.

> So [before it was they were] not coming to the doctor's office at all and just going to the ER, now they're coming to the doctor's office, they're getting their hypertension and diabetes follow up, or their COPD follow-up.
>
> We have patients that call our office and let us know that they are out of their meds. They call us if they don't understand something instead of going to the ED we have some, many of the patients now call to try to get an appointment and to let me know that they're thinking according to ED. but maybe they should come see us first.
>
> They can get visits in the same day if they call the clinic.

Mental Health Office Visits

Having a diagnosis of anxiety or depression was one of the two behavioral health diagnoses that were required to become eligible for MHH services (MDHHS, 2016b). Several nurses commented that the number of mental health office visits provided by a social worker would increase and suggested looking at this variable to determine if differences emerged between the intervention and comparison groups. The nurses discussed their role in helping facilitate the patient–provider relationship. Additionally, they highlighted their role in having patients take their behavioral health medications regularly and assuring they had their prescriptions filled regularly. Several nurses highlighted managing a patient's mental health issues.

> If a patient is going through depression or anxiety, and they have hypertension, treatment of hypertension is not going to mean anything.
>
> Now some of them will see a behavioral health person every month. That is what they need.
>
> We are connecting them with the social worker and they are getting more mental health services.
>
> We are identifying more conditions that we are treating. They are talking to us and we are getting to know them. They are opening up. They may have their initial nurse visit to set their goals and then we ask them about their depression and anxiety, and lot of them kind of open up more about that at each visit. Then we refer them and they are able to get the counseling that they need.
>
> If people never had services before and we do their PHQs [depression screening] and refer them for mental health services.
>
> If they have many stressors, they have to work through this. If mental health is recognized, and they can talk to someone who can give them healthy coping skills. Many are surprised that someone has recommended that they see someone, we help to remove the stigma. Many patients are getting more support and this impacts their overall health.

Table 6 provides information related to mental health office visits. Although the assumptions of normality were not met, a paired samples *t*-test was completed to assess mental health office visits. A paired samples *t*-test for the intervention group indicated a significant increase in mental health office visits completed after MHH implementation (*M* = 5.84, *SD* = 6.41) compared to before implementation [(*M* = 4.66, *SD* = 5.84); *t*(436) = -3.90, *p* = .000]. Similarly, in the comparison group, a paired samples *t*-test indicated a significant increase in mental health office-visit frequency (before implementation (*M* = 2.69, *SD* = 4.99) compared to after implementation [(*M* = 3.33, *SD* = 4.75); *t*(436) = -272, *p* = .007].

Table 6

Mental Health (MH) Office Visit Utilization

	Intervention group (*n* = 437)			Comparison group (*n* = 437)			Difference Between groups sig.(2-tailed)
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	
Total MH OV before	2,037	4.66	5.84	1.177	2.69	4.99	**p* = .000
Minimum	0			0			
Maximum	27			33			
Total MH OV after	2,551	5.84	6.41	1,457	3.33	4.75	
Minimum	0			0			
Maximum	48			35			
Difference within group sig.(2-tailed)		***p* = .000			***p* = .007		
Total MH visits 6 months before	1,099	2.51	3.27	720	1.65	3.24	**p* .000
Minimum	0			0			
Maximum	20			33			
Total MH visit 1–6 months after	1,295	2.96	3.48	707	1.62	2.76	
Minimum	0			0			
Maximum	31			20			
Difference within group sig. (2-tailed)		***p* = .010			***p* = .834		

Note. MH = mental health, OV = office visit, *Independent *t*-test, **Paired samples *t*-test.

Although office-visit frequency did increase for both groups, it was not known if this happened by chance or was influenced by a policy change that occurred several months prior to MHH implementation. In June of 2016, the Michigan Medicaid program implemented a new policy that allowed social workers and psychologists to complete mental health office visits and bill them directly to Medicaid (MDHHS, 2018a). This policy change resulted in increased access for Medicaid patients to mental health providers throughout Michigan.

Additional analysis was conducted to determine if a difference emerged between the two groups in short-term mental health office-visit use in relation to the new policy. This analysis focused on what occurred shortly after the new policy was implemented to see if a significant difference arose between groups. In the intervention group, a paired samples *t*-test was conducted to review mental health office-visit use patterns from 6 months prior to MHH implementation to the first 6 months after MHH implementation. The paired samples *t*-test indicated a significant increase in mental health office visits completed in the first 6 months following MHH implementation (*M* = 2.96, *SD* = 3.48) compared to before implementation [(*M* = 2.51, *SD* = 3.27); *t*(436) = -2.61, *p* = .010]. In the comparison group, a paired samples *t*-test indicated no change in mental health office-visit frequency completed 6 months prior to and after the MHH implementation timeframe (before implementation M = 1.65, *SD* = 3.24, after implementation [(*M* = 1.62, *SD* = 2.76); *t*(436) = .210, *p* = .834]. This finding suggests that when the policy became effective, patients had an immediate response and increased mental health office visits. Within the first 6 months of the MHH implementation time period, no significant increase in mental health visits arose for the comparison group; however, intervention-group mental health visits continued to increase.

Nurses believed that one of their roles in helping patients with their behavioral health issues was getting them connected with a social worker or another behavioral-health specialist. The nurses coordinated this care after completing a screening.

Immunizations

Influenza and pneumococcal immunizations were discussed with the nurses as to whether this would be effective to measure. Most nurses indicated this would not be beneficial to review. They indicated that no difference in immunization rates would emerge. They provided the following:

> [Immunizations] might not be worth measuring, they are offered everywhere and at every visit. … Immunizations are not a MI Care Team thing.
>
> [Immunizations are] not something that’s different. It’s always been offered in the past and it continues to be always offered in the future.

Immunization data were abstracted from the data warehouse to see if differences were noted. The data were not normally distributed and most data values were 0 or 1; therefore, a nonparametric test was completed. A Wilcoxon Signed-Ranks test was completed for the intervention and comparison groups pre- and post-MHH implementation. The Wilcoxon Signed-Ranks test indicated that the intervention post-MHH implementation ranks were not significantly higher than the pre-MHH implementation rate ranks for either group, (intervention $Z = -.154$, $p = .878$; comparison group $Z = -.241$, $p = .810$). This suggests the MHH did not impact immunization rates as nurses suggested.

Pharmacy

Most nurses suggested looking at pharmacy data. Many comments related to how some prescriptions would increase, whereas other comments indicated they would decrease. A list of therapeutic drug classes reviewed for each prescription variable can be found in Appendix J. Tables 7 and 8 provide prescription information from a pre- and post-12-month time period.

Table 7

Prescription Use

Variable	Intervention group (*n* = 437) *n*	*M*	*SD*	Comparison group (*n* = 437) *n*	*M*	*SD*	Difference Between groups sig.(2-tailed)
Total Rx before	36,947	84.55	51.54	25,423	58.18	45.34	
Total Rx after	40,362	92.36	52.76	27,615	63.19	49.26	

Note. Rx = Prescriptions.

Table 8

Pharmacy Prescription Use by Pharmacy Drug Class Comparing Use Before and After MHH Implementation

	Intervention group (*n* = 437)				Comparison group (*n* = 437)			
Variable	Before	After	% Change	*n*	Before	After	% Change	*n*
BH Rx	4,197	4,138	-1.41	-59	3,183	3,261	2.45	78
Asthma Rx	2,140	2,432	13.64	292	1,427	1,597	11.91	170
Asthma Rescue Rx	1,158	1,197	3.37	39	822	855	4.01	33
Opioid Rx	2,320	2,039	-12.11	-281	2,134	1,673	-21.60	-461
HTN Rx	2,090	2,214	5.93	124	1,312	1,423	8.46	111
Diabetes Rx	1,991	2,242	12.61	251	1,039	1,216	17.04	177

Note. BH = Behavioral health, Rx = Prescriptions, HTN = hypertension.

Findings related to the decrease in behavioral-health prescriptions may have inversely related to office visits for mental health, which was statistically higher after MHH implementation. In addition, opioid prescriptions decreased dramatically for both groups. This may be partially attributed to Michigan's efforts to decrease opioid prescription use (MDHHS, 2018c).

When nurses were asked if the number of pharmacy prescriptions would go up or down, most said they would go up, at least initially. Many commented that, over time, the number of prescriptions should go down, and indicated the following:

> Yes, it will go up. We are making sure their prescriptions are being refilled.
>
> A lot of times they don't take their meds or they stop their meds because they are feeling better.
>
> We also have worked with people to help with other management techniques. We worked with this big guy who was over 6 foot 2 and was using yoga and deep breathes to manage his anger. It was amazing how this big guy would talk about doing yoga rather than using the anxiety meds.
>
> They have slowed down their opioid usage.
>
> [Diabetes] may go up as we find more people with this disease, but it will go down as people are managing their diabetes better through lifestyle modifications. People are coming with HgbA1Cs at 13. Many patients are borderline diabetics and their goal is to get off their meds.
>
> It will decrease. They don't have to take as much medication. We do monitor medications on a monthly basis, so it may go down.
>
> I would say there is not much of a change. Similar to the office visits, some patients might be going down because they are getting better control of their disease. Some patients it may be going up because they are coming in and we realize they should be on some medication.
>
> We have seen a change (in opioids) overall, seen a decrease. A lot of our patients do come in with a lot of pain. We are integrated pretty well with our recovery center, they are our behavioral health providers. They do quite a bit of counseling for chronic pain and that has been really helpful for a lot of our patients. A lot of our MI Care Team patients are involved with different behavioral type of groups in our counseling center. They are using other methods to control pain. Our behavioral health team is very helpful.
>
> Depending on the patient this may go up or down. If they are bipolar they will probably always be bipolar and will always need some management medication to manage their disease. If we manage the disease properly they may not need the PRN medications, like Ativan. Those rates should go down after a while. Some people will always need their meds.

Other Statistics

A Pearson's correlation analysis was completed to determine if a relationship existed among age, risk scores, ER, and inpatient data for the comparison and intervention groups. The two outliers noted in the ER data were removed from this analysis (removing one outlier for the intervention group and one outlier for the comparison group). Tables 9 and 10 show the results.

Table 9

Comparison Group Pearson's Correlations (n = 436)

	Variable	Age	Risk scores	IP before	IP after	ER before	ER after
Age	Pearson Correlation						
	Sig. (2-tailed)						
Risk score	Pearson Correlation	.194**					
	Sig. (2-tailed)	.000	—				
IP before	Pearson Correlation	.054	.466**				
	Sig. (2-tailed)	.260	.000	—			
IP after	Pearson Correlation	-.001	.370**	.368**			
	Sig. (2-tailed)	.979	.000	.000	—		
ER before	Pearson Correlation	-.101*	.367**	.250**	.144**		
	Sig. (2-tailed)	.036	.000	.000	.002	—	
ER after	Pearson Correlation	-.051	.283**	.184**	.314**	.680**	
	Sig. (2-tailed)	.291	.000	.000	.000	.000	—

Note. IP = inpatient, ER = emergency room, *Correlation is significant at the $p < .05$ level, **Correlation is significant at the $p < .01$ level.

Table 10

Intervention Group Pearson's Correlations (n = 436)

	Variable	Age	Risk score	IP before	IP after	ER before	ER after
Age	Pearson Correlation						
	Sig. (2-tailed)	—					
Risk score	Pearson Correlation	$.200^{**}$					
	Sig. (2-tailed)	.000	—				
IP before	Pearson Correlation	-.007	$.415^{**}$				
	Sig. (2-tailed)	.886	.000	—			
IP after	Pearson Correlation	.076	$.550^{**}$	$.378^{**}$			
	Sig. (2-tailed)	.111	.000	.000	—		
ER before	Pearson Correlation	$-.169^{**}$	$.247^{**}$	$.207^{**}$	$.323^{**}$		
	Sig. (2-tailed)	.000	.000	.000	.000	—	
ER after	Pearson Correlation	-.059	$.275^{**}$	$.221^{**}$	$.439^{**}$	$.445^{**}$	
	Sig. (2-tailed)	.221	.000	.000	.000	.000	—

Note. *Correlation is significant at the $p < .05$ level, **Correlation is significant at the $p < .01$ level, IP = inpatient data.

The comparison and intervention groups had a significant positive correlation between age and risk score (comparison group Pearson's $r(436) = .194$, $p < .001$, intervention group Pearson's $r(436) = .200$, $p < .001$). A significant negative correlation emerged between age and ER usage before the implementation of the MHH [comparison group Pearson's $r(436) = -.101$, $p < .001$, intervention group Pearson's $r(436) = -.169$, $p < .001$]. The comparison and the intervention group results indicated a significant positive correlation between risk score and ER visits and inpatient hospitalizations before and after MHH implementation. These findings confirm that individuals with higher risk scores (or more chronic conditions) used the ER and had more hospitalizations. Age negatively correlated with use of the ER, which indicated that younger individuals with chronic conditions were more apt to go to the ER.

Discussion

Many factors highlighted nurses’ role in Medicaid chronic-disease health homes and their impact on patient-health outcomes. Results helped address the knowledge gap and have significant implications for the nursing profession. With the changing health care system-delivery environment and efforts to conserve financial resources, a need persists to fully understand the economic impact of nurses in outpatient settings (Trehearne, Fishman, & Linn, 2014). The information provided by MHH nurses along with the data from the first year of MHH operations suggests that nurses can impact patient satisfaction, build relationships and trust, and may impact ER use through specific interventions.

This study identified six themes related to the role of the nurse. The first theme was establishing trust and building relationships. Nurses can use a wide range of effective communication strategies and interpersonal skills to appropriately establish and maintain a nurse–patient relationship (Cudney, Weinert, & Kinion, 2011). However, the current health care climate, with its reduced appointment times and emphasis on economics, have made it difficult for health care providers to establish relationships with patients and provide the health care support needed. Developing a rapport with and involving a patient in their health care are important and these relationships made a difference in how health care was delivered in the MHH. Patients’ cultural, religious/spiritual, social, language, and decision-making needs should be addressed as part of the process and may involve family members as applicable (Boucher, White, & Keith, 2016). Nurses are well-positioned to establish health care relationships with patients, as nursing has been ranked the most trusted profession for 15 years in a row (Cudney et al., 2011; Morrow, 2018).

Listening was the second theme. Souza Carneiro et al. (2016) referenced listening as being silent while letting individuals talk about their reality, daily life issues, interpersonal relationships, and health status. A strong need existed for nurses to listen to and hear what the patient and their significant others were saying (Cudney et al., 2011). Listening, in turn, facilitated the ability to better support the patient to more successfully adapt to living with a chronic illness and served as grounds for health care planning. This theme helped nurses to "hear everything that was going on" with the patient to learn "where the patient was at."

The third theme, patient engagement and goal setting, was defined as a nurse-sensitive indicator that gave nurses a pivotal role in eliciting discussions with patients and their families on goals of health care, followed by carefully planned execution of interventions designed to increase patients' involvement in their care (Esposito, Rhodes, Beshoff, & Bonoel, 2016; Last, 2015). The nurses stressed the importance of engagement and how goals needed to be attainable. Several cautioned to ensure patients would not be set up to fail.

The fourth theme was direct access to the nurse and how important it was for patients to be able to reach someone in a timely manner. Individuals with chronic conditions may have medical issues that need to be addressed quickly. Nurses reported that patients would call them to help resolve problems or before going to the ER. Nurses must get to know and try to understand patients and their families in the context of their daily lives and consider their beliefs and habits in planning health care interventions (Souza Carneiro et al., 2016). Nurses are available to patients, can connect with patients in ways unlike doctors, and have the ability to work with patients in making health care more accessible (Ehrlich et al., 2012; Prokop, 2016).

The fifth theme, addressing social determinants of health, and the sixth theme, education, closely related. Social determinants of health and health outcomes link and it may be necessary to address these issues to improve a patient's health (Ebell, Marchello, & O'Connor, 2017). Social determinants of health may impact the provision of health care for low-income patients with chronic conditions and identifying these issues was necessary to improve health care management (Ebell et al., 2017). The nurses clearly indicated what impact homelessness or lack of food had on their provision of health care. Health literacy connects with social determinants and education. Health education is foundational to the nursing profession and was a theme nurses frequently mentioned. Many MHH patients needed additional education and guidance to help navigate the health care system. The MHH model provided the structure that allowed nurses to provide education and to assess how well the patient understood and applied the information (Last, 2015).

With the predicted increase of individuals with chronic disease (Thorpe & Philyaw, 2012), health care systems should consider a greater role for nurses. A need persists to build collaborative care models to manage health care for patients with chronic conditions to achieve improved clinical outcomes and more appropriate use of health services. The nurse's role in health care continues to evolve, requiring more clinical action (Matumoto & da Silva Manso, 2015; Trehearne et al., 2014).

The researcher confirmed the importance of evaluating ER-visit rates, inpatient hospital stays, and office-visit rates, and added the review of mental health office-visit rates, immunizations, and pharmacy use as dependent variables in the study. Results from the first year following MHH implementation indicated that some positive health care outcome changes occurred in the intervention group. Statistical differences arose in the intervention group with a reduction of ER use, an increase in office visits, and an increase in mental health-related office visits. These findings aligned with nurses’ general predictions, consistent with Glynn et al. (2011), indicating that office visits would go up in the first year of a patient’s enrollment in a health home.

Despite no statistical differences found in inpatient hospital stays, the total number of inpatient hospital visits decreased more in the intervention group than the comparison group. These findings were important because the intervention group had a significantly older patient population with higher risk scores. Further data analysis indicated that as risk scores go up, ER use also increased; however, an inverse relationship emerged between age and ER usage in the intervention group. This suggested that younger people with chronic conditions were more likely to use the ER. The intervention-group age and risk scores were statistically higher than those of the comparison group, suggesting that the model is reaching older and higher acuity patients.

Several authors indicated that the nurse’s role in the primary care setting was not clearly defined. It was hard to specifically define the nurse’s role in an MHH model as it tended to be diverse, depending on the patient’s need. The nurse was the person who assessed the patient’s needs, established and built a trusting relationship, made themselves accessible, developed the plan and direction for the patient’s overall health care, educated the patient, and directed the health care team. The nurse had to reassess their role and change as the needs of the patient and health care team changed. It is important that the nurse and the team change to meet the needs of the patient, and not expect the patient to change to meet the needs of the health care team.

Strengths and Limitations

Strengths

This exploratory mixed-methods study resulted in information that could not be obtained through one method alone (aligned with Creswell & Plano-Clark, 2011). The strength of the qualitative component was that new concepts or themes were identified related to the nurses' perceptions of their MHH role. New knowledge and understanding of this phenomenon was gained, as no studies have been published on this method. A strength of the ex post facto quantitative design was inclusion of data from all eligible intervention participants in the study. Results provide information about how well Michigan's MHH impacts health-service-use outcomes and adds to the MHH literature. Patients did not know their health-use patterns were being researched, which helped to prevent internal validity issues such as diffusion of treatment, compensatory rivalry, or testing (as in Creswell, 2014).

Threats to external validity were reduced by using the entire eligible population in performing the data analysis in Michigan (Portney & Watkins, 2009). This process helped make the results more generalizable to the population; however, results may be limited to MHH patients and may not reflect findings in other states. An ex post facto quantitative-study-design approach reduced the time and resources required to complete the study. This design builds on the premise of research that investigators attempt to determine the cause or consequences of differences that exist between groups (Center for Innovation in Research and Teaching [CIRT], 2016). The MHH enrollees who met the sample requirements through the first 3 months of implementation were included in the study.

To assure providers implement and operationalize the model as designed, Michigan completed a number of measures to assure model adherence. The state selected FQHC MHH providers though an invitation-to-bid process, where an interested provider submitted an application to be scored by a review committee, based on standardized criteria. Only the FQHCs that met the invitation-to-bid criteria were allowed to become MHH providers. The MDHHS realized that ongoing training and technical assistance would be essential to the success of the MHH initiative. To assure providers adhere to the model design and to provide support, ongoing technical assistance is made available through additional trainings, regular care-coordination conference calls, allowance for providers to submit questions, and MHH topical webinars (MDHHS, 2017b). The MDHHS conducts periodic onsite reviews to monitor MHH implementation uniformity. MDHHS created a website specific to this project that is regularly updated. In addition, MDHHS developed an MHH policy and an MHH manual that provides detailed information related to MHH-provider expectations. Providers are very engaged in the process and welcome oversight from the department (Borrelli, 2011; MDHHS, 2017b).

Selection of patients was completed through review of paid-claims data to assure they had been in the MHH for 12 months postimplementation. The study’s coding process was uniform in querying claims in determining health care use pre- and postimplementation. The data were queried for the intervention and comparison groups at the same time, to equalize the amount of time a claim may have been submitted and adjudicated.

Limitations

Limitations of this study may include threats to internal and external validity. The lack of a firm content-analysis definition and procedures could potentially limit the application of this process (Hsieh & Shannon, 2005). Another qualitative threat to internal validity may be due to how the nurse's role in the 10 FQHC MHH models may differ and may not adhere to the original model designed by the MDHHS. From a researcher point of view, an internal qualitative threat related to drawing incorrect inferences, which could also present an issue (Creswell, 2014).

From a quantitative standpoint, the greatest threat to time series with a pretest and posttest approach is history, as no control exists of a coincidental occurrence of some extraneous event that may occur at the same time that treatment is initiated (Portney & Watkins, 2009). New Medicaid policies were introduced over the course of the study timeframe that may have impacted how care was delivered. This was evident for mental health office visits, as an initial increase emerged in the provision of these services for both groups after the implementation of a new policy providing access to mental health services. Also, a historical threat related to opioids; Michigan has launched a campaign to improve the way opioids are prescribed (MDHHS, 2018c). However, these threats were equally distributed across the intervention and comparison groups.

Implementation of MHH models involves a number of different providers. It was difficult to assure that all providers implementing the model did so in a uniform fashion and maintained fidelity to the model, which can create a potential proficiency bias (aligned with Portney & Watkins, 2009). The MDHHS had frequent contact with each MHH staff and conducted periodic site visits to limit variability (MDHHS, 2017b).

Another threat to internal validity was selection. Individuals were selected based on their history of behavioral-health and physical-health chronic diseases through the use of International Classification of Diseases, 10th edition, diagnosis data-coding sets. The accuracy of the data was influenced by provider identification of diseases and the biller's accuracy of coding. If an individual had one of the MHH diagnoses on the claim, yet did not actually have this disease, they could have been selected for the study inappropriately. The opposite problem could have occurred if an individual had one of the diagnoses that qualified them for the MHH, but their provider did not include the correct diagnosis on their service claims. As a result they would not have been included in the study. Also, a concern related to inequality of the intervention and the comparison group. When looking at ER and hospital claims, the groups may have varied in how the claims were coded for diagnosis and procedure-code billings, and additional concern related to timely billing and payment of claims. It was possible that a provider took up to a year to submit a claim; therefore, the individual may not have been included in the study, which would impact study results. Data were queried on the same day for both groups to equalize this potential limitation (as suggested by Creswell, 2014; Green-Edwards, n.d.).

Another issue with selection related to comparing individuals who decided to enroll in an MHH versus those who did not. When comparing results, it may be possible that individuals in the MHH are more willing to change their health-care-use behavior. Despite efforts to improve health care use, if the patient is not fully engaged, negative outcomes may occur or no behavioral modifications would occur, which creates a potential compliance bias (Portney & Watkins, 2009). Preexisting factors and other influences are not considered because variables are less controlled in an ex post facto design research. If other variables are not controlled, the researcher cannot be assured that the treatment was the sole factor causing the outcome. A pretest and posttest does help control for some of these limitations (CIRT, 2016; Creswell, 2014).

Another threat to internal validity is attrition, where individuals decide to end their enrollment in the MHH, thereby reducing the intervention population numbers (Portney & Watkins, 2009). Lack of randomization can lead to unequal test groups, which can lead to external-validity issues, making the study results less generalizable (Portney & Watkins, 2009). Generally, conclusions about causality are less definitive in ex post facto designs (CIRT, 2016). This may have been less of an issue in this study because the study included all eligible individuals statewide. A final threat to validity relates to disease maturation; however, some of this threat was mitigated through the use of a comparison group, as disease maturation should have occurred equally to both groups and would have impacted the statistical outcomes similarly (Creswell, 2014).

Summary

Given the need to help people manage their chronic diseases and the opportunities that exist to effect change, conducting research to learn from nurses practicing in a health home was extremely beneficial. The information gleaned helped fill the literature gap by providing information related to nurses' perceptions of how their MHH role impacted the health care provided to individuals with chronic diseases. The study also discerned the impact of this care on use-rate changes specific to ER, inpatient hospitalizations, office visits, and mental health office visits.

Care-coordination interventions through an MHH model represented a wide range of approaches at the service-delivery and systems level. Determining their effectiveness depended on an appropriate match between the intervention, the care coordination, the provider, and the individual (AHRQ, 2007). The six themes provided insight as to nurses' perceived role in an MHH and how they impacted health outcomes. The overarching message addressed connecting with the patient and taking the time to find out what was important to them. Unfortunately, the current health care climate, with its reduced appointment times and emphasis on economics, has made it difficult for health care providers to "find out where the patient is at," as indicated by MHH nurses. The early findings indicated that the nurse–patient connection made a difference in health-care-use patterns.

The patient population served in the health home included individuals who were low-income and had chronic conditions. Factors related to health equity as it relates to the social determinants of health and the need to address issues related to homelessness or lack of food resources became part of the purview of the MHH staff. Patients felt the fair distribution of social resources to achieve well-being, creating an environment of acceptance and social justice (Canady, 2018). Additional research is warranted to further identify the nurse's role in a health home and to identify needed policy improvements that will increase the role and contributions of nursing to improve health outcomes in individuals with chronic conditions.

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Chapter Five

Summary and Conclusion

The current U.S. health care system with its reduced appointment times and emphasis on economics have made it difficult for health care providers to adequately provide services to low-income patients with chronic conditions. Somewhere along the way, the business of health care has lost human contact needed to really understand where a patient is in their health care management process. This issue is further complicated when there is both a mental and a physical chronic health condition and health inequities.

Health home models serve to fill the gap in health care by engaging these patients and encouraging better health outcomes. Clearly defining roles and what the care coordination process entails is a necessary first step in improving health care management. A second step is the process of designing and implementing a health home. Michigan’s experience in implementing a health home program served to identify the many complexities health policy makers need to address to change how the primary health care system is designed and reimbursed. This too is a necessary step in the process to reach a fragile, low-income population.

Finally, the nurse’s role in a MHH is very important and their role cannot be underestimated. Nurses are trusted by patients and can engage and connect with patients in ways unlike other health care providers. The nurses frequently commented on how listening to the patient and “figuring out where they are at” was an important first step in improving the health care of patients with chronic conditions. Six major themes were identified related to the nurse’s role. The nurse is able to spend more time with patients and provide this type of care under the MHH payment structure. Results in the first 12 months of the MHH indicate that patients have more access to care in the primary care setting, are having more mental health office visits, and their ER usage is going down as compared to the comparison group.

Implications for Nursing Practice

The implications for nursing practice in a Medicaid health home can be far reaching. Care coordination for individuals with chronic diseases, which is fundamental to the health home function, is central to the role of nursing. The nurse historically has been a primary care coordinator and leader who has the knowledge and expertise to lead the care coordination efforts. Coordinated care is a core function of team-based primary and community care that delivers regular and supportive care to people with complex chronic disease care needs. Nurses made important contributions to the MHH and connected with the patients. Providing health home services requires a patient-centered multidisciplinary collaborative team in which nurses are well-positioned to serve in the care coordinator role and need to be recognized as leaders.

The nurse is central to the model and it is through this position that the care and team management is organized. Management of patients with chronic conditions is not an easy process. The nurse is a trusted professional and is the key to connecting with the patient and identify their needs. The primary role that nurse's perform in the MHH is to identifying and filling the gaps in patient care. Each patient has their own story, and as a result, their own unique gaps. The nurse works to support the patients and their caregiver's ability to address health care or social determinants of health and then addresses those remaining gaps where patient deficits exists.

Next Steps

Understanding the importance of care coordination and building a MHH is a complex process, but is worthwhile given the outcomes of this study. Although some promising results were found, an important next step in determining the effectiveness of the MHH is to conduct a cost analysis to determine if this process will lead to budget savings. Other points to consider include better understanding of the impact the MHH may have on opioid usage. Typically it takes longer than 12 months to see any substantive changes in health outcomes after a health home is initiated; therefore, repeating the quantitative portion of this study after 24 months of the MHH implementation would provide a better understanding of longer term impacts of the health home.

It will also be important to understand how a MHH is viewed from a patient perspective. Gaining knowledge from the patient’s perspective regarding the impact of the MHH on their health care utilization behavior, and learning what impact the MHH has made in quality of life is another step. How the role of nursing influenced them would be important information to learn. Finally, it would also be beneficial to look at other health outcome data such as changes in HgbA1cs, blood pressure readings, and body mass index (BMI). This information would have to be obtained from each MHH electronic health record systems individually.

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Appendix A: Theoretical Framework

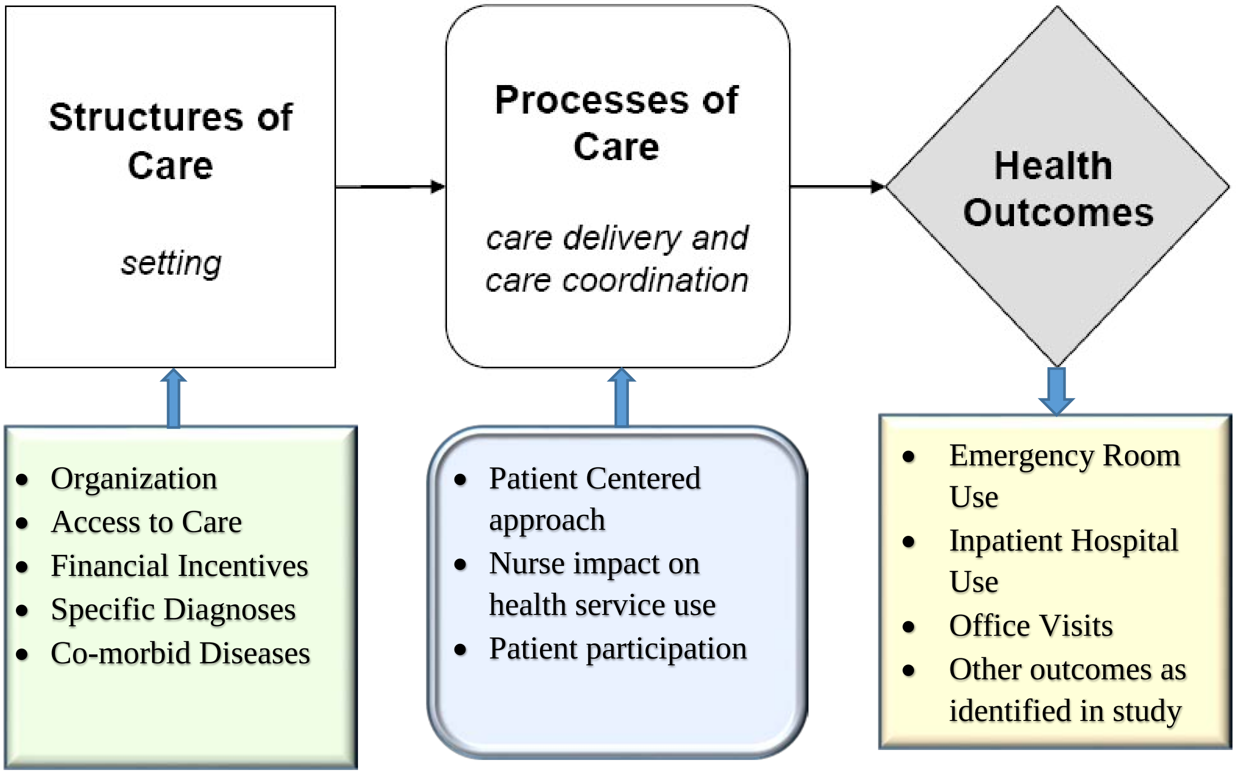


Figure 1. Donabedian's Quality Framework Adapted by Medical Outcomes Study Framework.
Source: Agency for Health Care Research and Quality (2007), Donabedian (2005), with adaptation from the Medical Outcomes Study, Tarlov et al. (1989).

Appendix B: Procedural Design Diagram

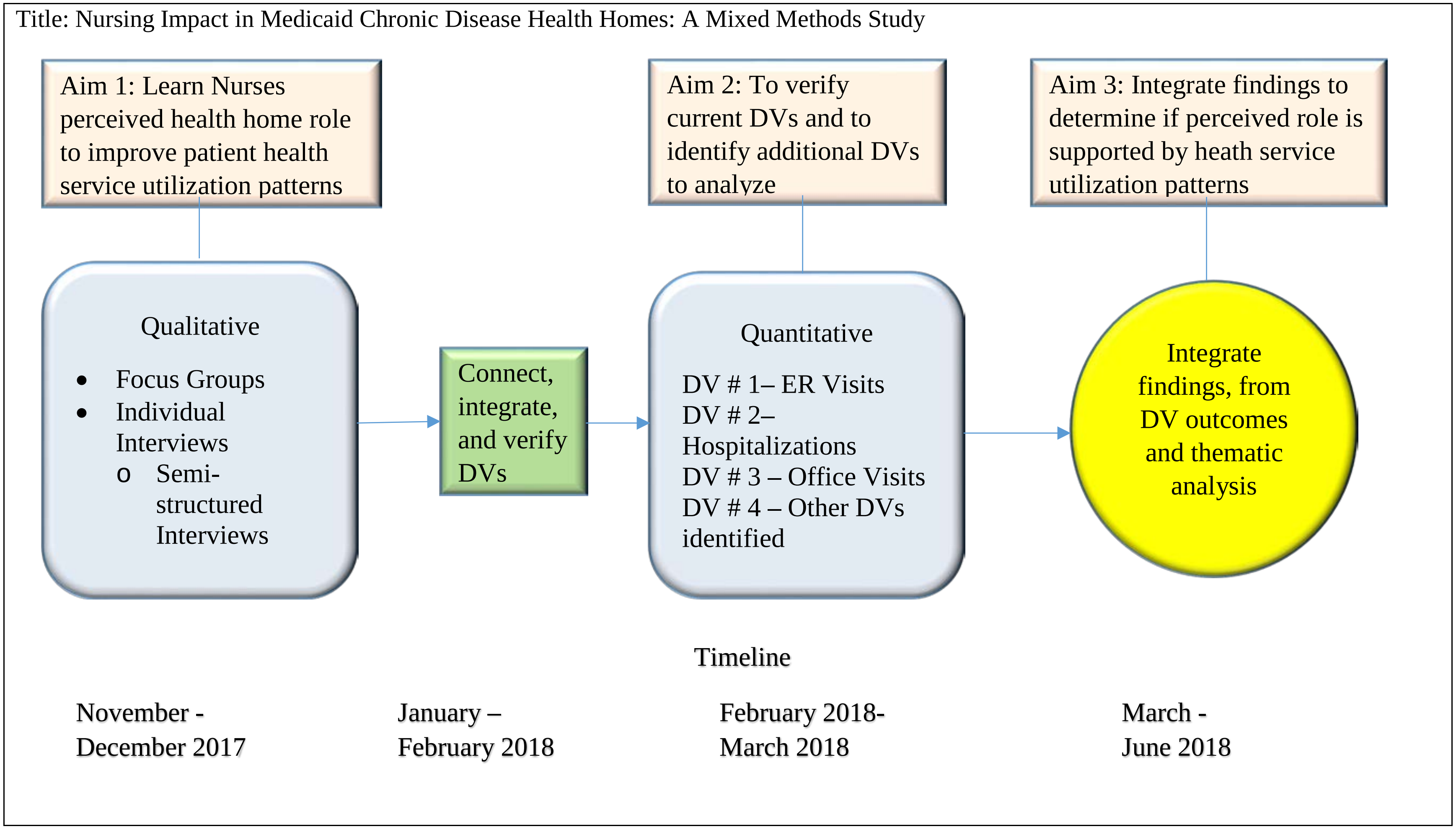


Figure 2. Procedural Design Diagram

Appendix C: IRB Approval University of Texas at Tyler

THE UNIVERSITY OF TEXAS AT TYLER
3900 University Blvd. • Tyler, TX 75799 • 903.565.5774 • FAX: 903.565.5858

Office of Research and
Technology Transfer

Institutional Review Board

October 6, 2017

Dear Ms. Prokop,

Your request to conduct the study: *Nurse's Perceptions and Impact on Chronic Disease Health Home Patient's Healthcare Service Utilization Outcomes,* IRB #F2017-21 has been approved by The University of Texas at Tyler Institutional Review Board under expedited review. This approval includes the written informed consents that are attached to this letter, and your assurance of participant knowledge of the following prior to study participation: this is a research study; participation is completely voluntary with no obligations to continue participating, and with no adverse consequences for nonparticipation; and assurance of confidentiality of their data.

In addition, please ensure that any research assistants are knowledgeable about research ethics and confidentiality, and any co-investigators have completed human protection training within the past three years, and have forwarded their certificates to the IRB office (G. Duke).

Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:

- This approval is for one year, as of the date of the approval letter
- **<u>The Progress Report form must be completed for projects extending past one year.</u>** Your protocol will automatically expire on the one year anniversary of this letter if a Progress Report is not submitted, per HHS Regulations **prior** to that date (45 CFR 46.108(b) and 109(e): http://www.hhs.gov/ohrp/policy/contrev0107.html
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity

Appendix C: (Continued)

- **<u>Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others</u>**

EQUAL OPPORTUNITY EMPLOYER

- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

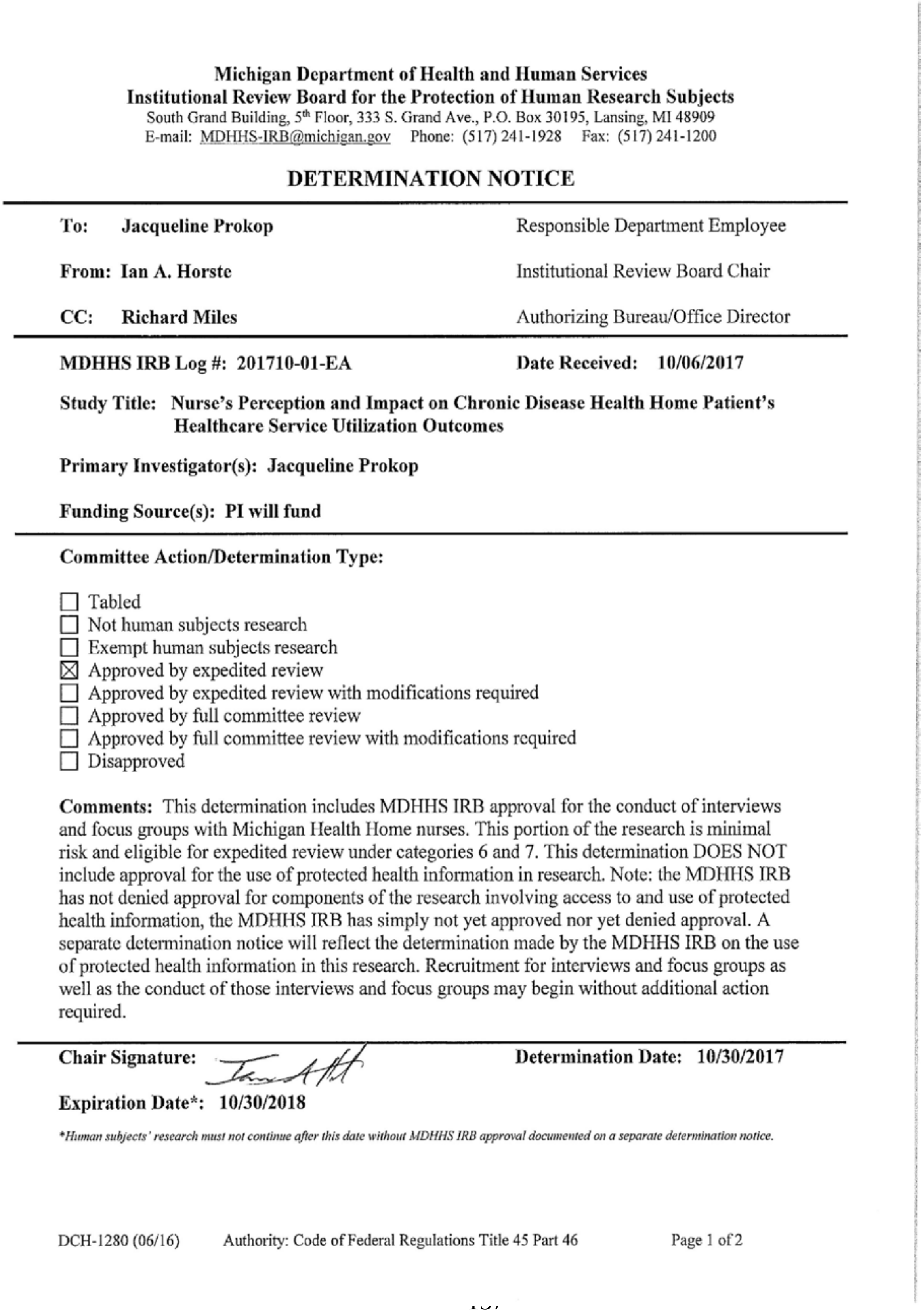
Sincerely,

Gloria Duke, PhD, RN

Gloria Duke, PhD, RN

Chair, UT Tyler IRB

Appendix D: Qualitative and Quantitative IRB Approval State of Michigan



Michigan Department of Health and Human Services
Institutional Review Board for the Protection of Human Research Subjects
South Grand Building, 5th Floor, 333 S. Grand Ave., P.O. Box 30195, Lansing, MI 48909
E-mail: MDHHS-IRB@michigan.gov Phone: (517) 241-1928 Fax: (517) 241-1200

DETERMINATION NOTICE

To: Jacqueline Prokop Responsible Department Employee

From: Ian A. Horste Institutional Review Board Chair

CC: Richard Miles Authorizing Bureau/Office Director

MDHHS IRB Log #: 201710-01-EA **Date Received: 10/06/2017**

Study Title: Nurse's Perception and Impact on Chronic Disease Health Home Patient's Healthcare Service Utilization Outcomes

Primary Investigator(s): Jacqueline Prokop

Funding Source(s): PI will fund

Committee Action/Determination Type:

☐ Tabled
☐ Not human subjects research
☐ Exempt human subjects research
☒ Approved by expedited review
☐ Approved by expedited review with modifications required
☐ Approved by full committee review
☐ Approved by full committee review with modifications required
☐ Disapproved

Comments: This determination includes MDHHS IRB approval for the conduct of interviews and focus groups with Michigan Health Home nurses. This portion of the research is minimal risk and eligible for expedited review under categories 6 and 7. This determination DOES NOT include approval for the use of protected health information in research. Note: the MDHHS IRB has not denied approval for components of the research involving access to and use of protected health information, the MDHHS IRB has simply not yet approved nor yet denied approval. A separate determination notice will reflect the determination made by the MDHHS IRB on the use of protected health information in this research. Recruitment for interviews and focus groups as well as the conduct of those interviews and focus groups may begin without additional action required.

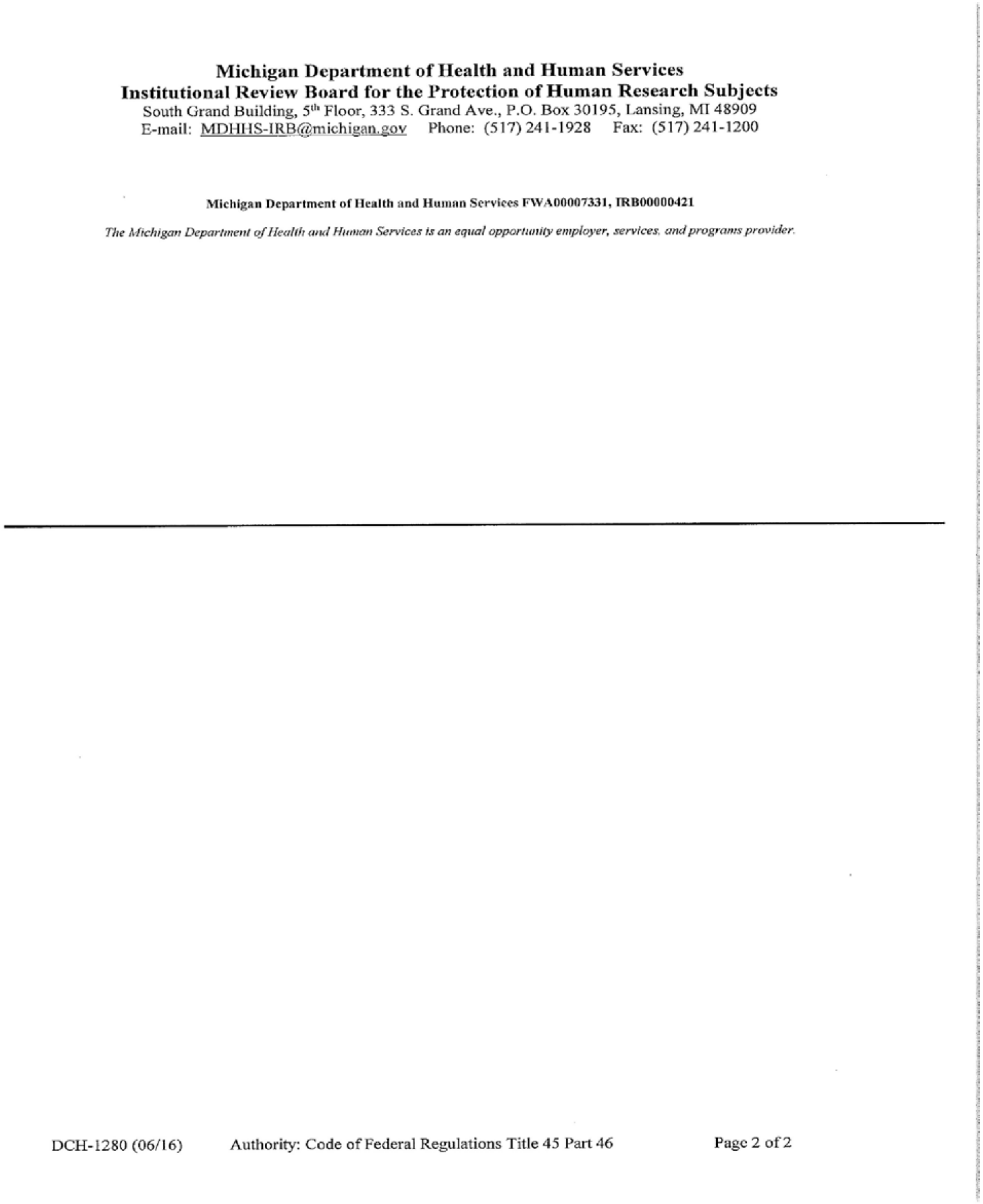
Chair Signature: **Determination Date: 10/30/2017**

Expiration Date*: 10/30/2018

**Human subjects' research must not continue after this date without MDHHS IRB approval documented on a separate determination notice.*

DCH-1280 (06/16) Authority: Code of Federal Regulations Title 45 Part 46 Page 1 of 2

Appendix D: (Continued)



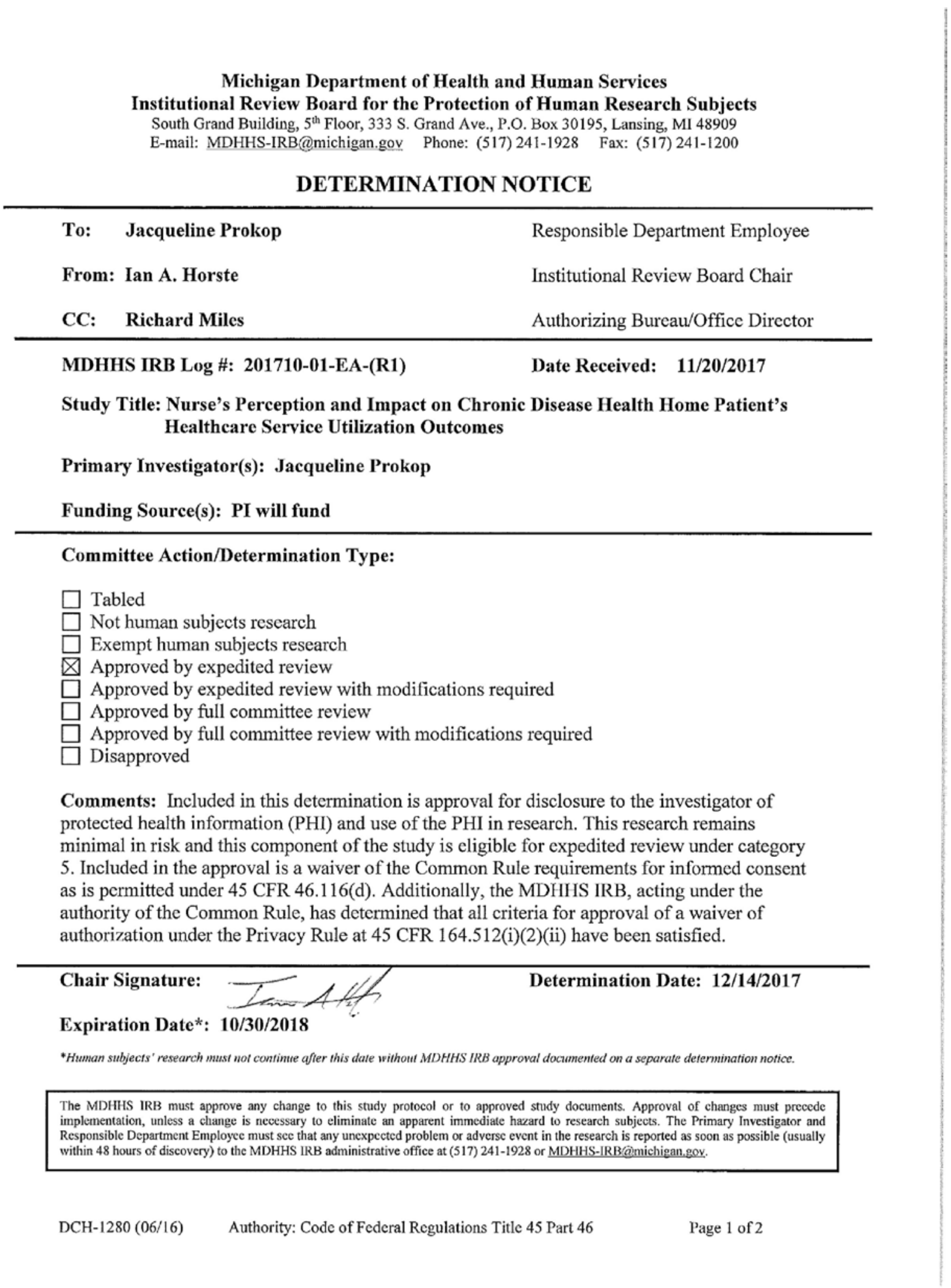
Michigan Department of Health and Human Services
Institutional Review Board for the Protection of Human Research Subjects
South Grand Building, 5th Floor, 333 S. Grand Ave., P.O. Box 30195, Lansing, MI 48909
E-mail: MDHHS-IRB@michigan.gov Phone: (517) 241-1928 Fax: (517) 241-1200

Michigan Department of Health and Human Services FWA00007331, IRB00000421

The Michigan Department of Health and Human Services is an equal opportunity employer, services, and programs provider.

DCH-1280 (06/16) Authority: Code of Federal Regulations Title 45 Part 46 Page 2 of 2

Appendix D: (Continued)



Michigan Department of Health and Human Services
Institutional Review Board for the Protection of Human Research Subjects
South Grand Building, 5th Floor, 333 S. Grand Ave., P.O. Box 30195, Lansing, MI 48909
E-mail: MDHHS-IRB@michigan.gov Phone: (517) 241-1928 Fax: (517) 241-1200

DETERMINATION NOTICE

To: Jacqueline Prokop Responsible Department Employee

From: Ian A. Horste Institutional Review Board Chair

CC: Richard Miles Authorizing Bureau/Office Director

MDHHS IRB Log #: 201710-01-EA-(R1) **Date Received: 11/20/2017**

Study Title: Nurse's Perception and Impact on Chronic Disease Health Home Patient's Healthcare Service Utilization Outcomes

Primary Investigator(s): Jacqueline Prokop

Funding Source(s): PI will fund

Committee Action/Determination Type:

☐ Tabled
☐ Not human subjects research
☐ Exempt human subjects research
☒ Approved by expedited review
☐ Approved by expedited review with modifications required
☐ Approved by full committee review
☐ Approved by full committee review with modifications required
☐ Disapproved

Comments: Included in this determination is approval for disclosure to the investigator of protected health information (PHI) and use of the PHI in research. This research remains minimal in risk and this component of the study is eligible for expedited review under category 5. Included in the approval is a waiver of the Common Rule requirements for informed consent as is permitted under 45 CFR 46.116(d). Additionally, the MDHHS IRB, acting under the authority of the Common Rule, has determined that all criteria for approval of a waiver of authorization under the Privacy Rule at 45 CFR 164.512(i)(2)(ii) have been satisfied.

Chair Signature: **Determination Date: 12/14/2017**

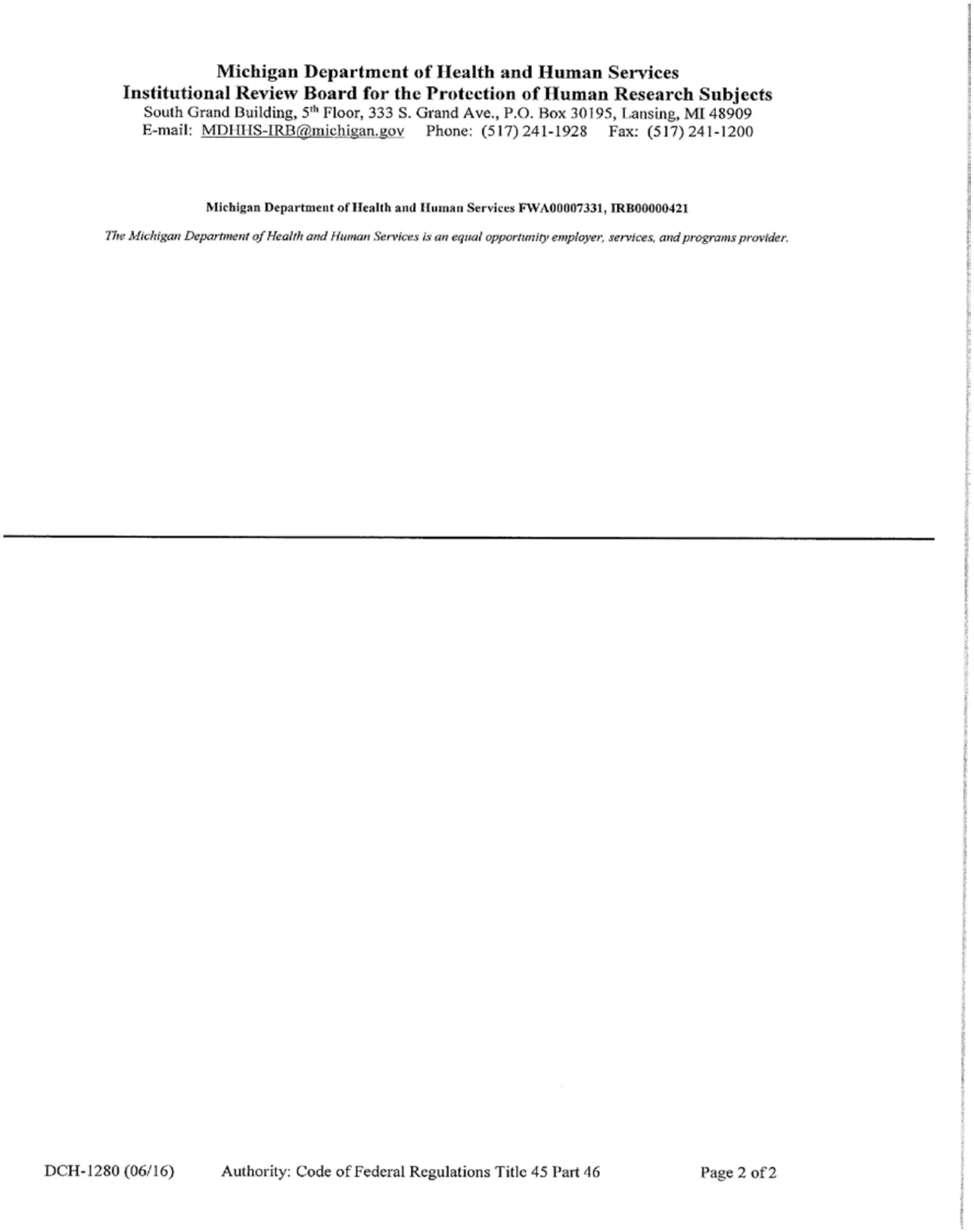
Expiration Date*: 10/30/2018

**Human subjects' research must not continue after this date without MDHHS IRB approval documented on a separate determination notice.*

The MDHHS IRB must approve any change to this study protocol or to approved study documents. Approval of changes must precede implementation, unless a change is necessary to eliminate an apparent immediate hazard to research subjects. The Primary Investigator and Responsible Department Employee must see that any unexpected problem or adverse event in the research is reported as soon as possible (usually within 48 hours of discovery) to the MDHHS IRB administrative office at (517) 241-1928 or MDHHS-IRB@michigan.gov.

DCH-1280 (06/16) Authority: Code of Federal Regulations Title 45 Part 46 Page 1 of 2

Appendix D: (Continued)



Michigan Department of Health and Human Services
Institutional Review Board for the Protection of Human Research Subjects
South Grand Building, 5th Floor, 333 S. Grand Ave., P.O. Box 30195, Lansing, MI 48909
E-mail: MDHHS-IRB@michigan.gov Phone: (517) 241-1928 Fax: (517) 241-1200

Michigan Department of Health and Human Services FWA00007331, IRB00000421

The Michigan Department of Health and Human Services is an equal opportunity employer, services, and programs provider.

DCH-1280 (06/16) Authority: Code of Federal Regulations Title 45 Part 46 Page 2 of 2

Appendix E: Consent Form

THE UNIVERSITY OF TEXAS AT TYLER

Informed Consent to Participate in Research

Institutional Review Board # F2017-21

Approval Date: October 3, 2017

Project Title: Nurse's Perceptions and Impact on Chronic Disease Health Home Patient's Healthcare Service Utilization Outcomes

1. **Principal Investigator:** Jackie Prokop, PhD(c), MHA, RN

2. **Participant's Name:** ________________________________

3. **To the Participant:**

You are being asked to take part in this study at The University of Texas at Tyler (UT Tyler). This permission form explains:

- Why this research study is being done.
- What you will be doing if you take part in the study.
- Any risks and benefits you can expect if you take part in this study.

After talking with the person who asks you to take part in the study, you should be able to:

- Understand what the study is about.
- Choose to take part in this study because you understand what will happen

4. Description of Project

This project will help me as a nurse researcher to better understand your role regarding the impact of the Medicaid Health Home (MHH) on patient healthcare outcomes. In order to do this, I will be interviewing you either as part of a group of 6-10 other nurses, or individually.

After the interviews, I will analyze what was said and use that information to determine quantitatively the MHH impact on emergency room utilization, hospitalization, office visit utilization, and other data factors.

5. Research Procedures

If you agree to be in this study, we will ask you to do the following things:

- Participate voluntarily in a focus group or individual interview that will be audio recorded

- Location of the interviews will be at a hotel conference center, and individual interviews will be per telephone at a mutually agreed upon time between you and the researcher
- Interviews will last about 30 minutes to 1 hour
- Provide your phone number and email address so you may be contacted via text message or email with further information about the study.
- Agree to review and comment on the findings of the focus group and interviews.
- Agree to communicate with the researcher if more information is needed.

6. Side Effects/Risks

Minimal risks associated with this study may involve concerns with access to personal data such as participant name, phone number, and email address. All personal identifying information will be removed before it is used in the study. While in the results the researcher may quote something a participant said, the participants' identities will remain confidential and known only to the researcher. Beyond that, there are no known risks to participating in this study other than the time it will take to complete the focus group or interview and review results to clarify and/or ensure accuracy of transcripts.

7. Potential Benefits

While completing the survey may not benefit you individually, you will be helping researchers understand what impacts nurses have on a MHH and their perception of their care coordination role. This will add to what is known about the nurse's role in managing individuals with chronic conditions.

8. Understanding of Participants

a) I have been given a chance to ask any questions about this research study. The researcher has answered my questions.

b) If I sign this consent form I know it means that:

  - I am taking part in this study because I want to. I chose to take part in this study after having been told about the study and how it will affect me.

  - I know that I am free to not be in this study. If I choose to not take part in the study, then nothing will happen to me as a result of my choice.

  - I know that I have been told that if I choose to be in the study, then I can stop at any time. I know that if I do stop being a part of the study, then nothing will happen to me.

c) I have been promised that that my name will not be in any reports about this study.

d) I also understand that any information collected during this study may be shared as long as no identifying information such as my name, address, or other contact information is provided).

e) I understand The UT Tyler Institutional Review Board (the group that makes sure that research is done correctly and that procedures are in place to protect the safety of research participants) may look at the research documents. These documents may have information that identifies me on them. This is a part of the monitoring procedure used to ensure that my rights as a research participant are protected. I also understand that my personal information will not be shared with anyone.

f) I have been told about any possible risks that can happen with my taking part in this research project.

g) If I have any questions concerning my participation in this project, I will contact the principal researcher: Jackie Prokop (517-512-3936) or email (jprokop@patriots.uttyler.edu).

8. If I have any questions concerning my rights as a research subject, I will contact Dr. Gloria Duke, Chair of the IRB, at (903) 566-7023, gduke@uttyler.edu, or the University's Office of Sponsored Research:

The University of Texas at Tyler
c/o Office of Sponsored Research
3900 University Blvd
Tyler, TX 75799

I understand that I may contact Dr. Duke with questions about research-related injuries.

9. CONSENT/PERMISSION FOR PARTICIPATION IN THIS RESEARCH STUDY

I have read and understood what has been explained to me. I give my permission to take part in this study as it is explained to me. I give the study researcher permission to register me in this study. I have read, understood, and printed a copy of the above consent form and desire of my own free will to participate in this study.

______________________________ Participant Name	__________________ Date
______________________________ Witness	__________________ Date

Appendix F: Interview Guide

Open-ended questions for the focus group and individual interviews

A. Nurses Experience

1. What has been your experience with serving as the nurse care manager in the health home model?
2. Has participating in the health home model made a difference in how you provide and coordinate care for the patients served?

B. Improving the Model

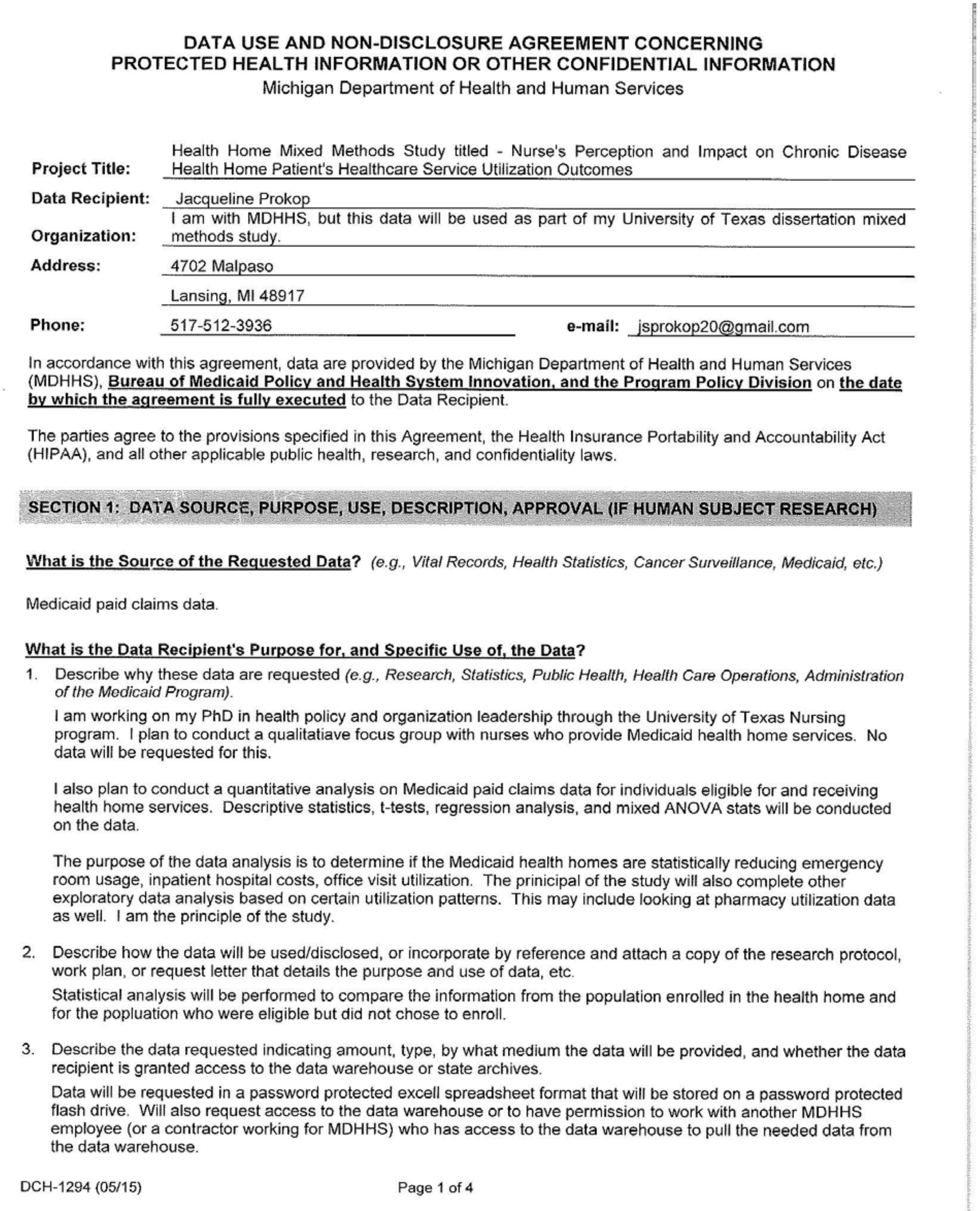
3. Do you have any recommendations to improve how care coordination is provided?
4. Do you have any recommendations to improve how the health home team oversees and manages the care for the health home patient?
5. If you could add or change anything in the health home model related to the nursing role, what would it be?
6. How do you feel your role has impacted how patients use health care services?

C. Verifying and Determining the Impact of Dependent Variables

1. What health care services do you believe have changed with individuals in the health home?
2. What impact do you think your role in a health home has on patient's use of the emergency room?
3. What impact do you think your role in a health home has on patients' inpatient hospital use?
4. What impact do you think your role in a health home has on patient's office visit use?
5. In looking at outcomes related to health care service utilization, do you think looking at emergency room use, inpatient hospitalizations and office visits are appropriate? Why or why not?

What other outcomes do you believe should be looked at as part of this study?

Appendix G: Data Use Agreement State of Michigan



DATA USE AND NON-DISCLOSURE AGREEMENT CONCERNING PROTECTED HEALTH INFORMATION OR OTHER CONFIDENTIAL INFORMATION

Michigan Department of Health and Human Services

Project Title: Health Home Mixed Methods Study titled - Nurse's Perception and Impact on Chronic Disease Health Home Patient's Healthcare Service Utilization Outcomes

Data Recipient: Jacqueline Prokop

Organization: I am with MDHHS, but this data will be used as part of my University of Texas dissertation mixed methods study.

Address: 4702 Malpaso
Lansing, MI 48917

Phone: 517-512-3936 **e-mail:** jsprokop20@gmail.com

In accordance with this agreement, data are provided by the Michigan Department of Health and Human Services (MDHHS), **Bureau of Medicaid Policy and Health System Innovation, and the Program Policy Division** on **the date by which the agreement is fully executed** to the Data Recipient.

The parties agree to the provisions specified in this Agreement, the Health Insurance Portability and Accountability Act (HIPAA), and all other applicable public health, research, and confidentiality laws.

SECTION 1: DATA SOURCE, PURPOSE, USE, DESCRIPTION, APPROVAL (IF HUMAN SUBJECT RESEARCH)

What is the Source of the Requested Data? *(e.g., Vital Records, Health Statistics, Cancer Surveillance, Medicaid, etc.)*

Medicaid paid claims data.

What is the Data Recipient's Purpose for, and Specific Use of, the Data?

1. Describe why these data are requested *(e.g., Research, Statistics, Public Health, Health Care Operations, Administration of the Medicaid Program).*

   I am working on my PhD in health policy and organization leadership through the University of Texas Nursing program. I plan to conduct a qualitatiave focus group with nurses who provide Medicaid health home services. No data will be requested for this.

   I also plan to conduct a quantitative analysis on Medicaid paid claims data for individuals eligible for and receiving health home services. Descriptive statistics, t-tests, regression analysis, and mixed ANOVA stats will be conducted on the data.

   The purpose of the data analysis is to determine if the Medicaid health homes are statistically reducing emergency room usage, inpatient hospital costs, office visit utilization. The prinicipal of the study will also complete other exploratory data analysis based on certain utilization patterns. This may include looking at pharmacy utilization data as well. I am the principle of the study.

2. Describe how the data will be used/disclosed, or incorporate by reference and attach a copy of the research protocol, work plan, or request letter that details the purpose and use of data, etc.

   Statistical analysis will be performed to compare the information from the population enrolled in the health home and for the popluation who were eligible but did not chose to enroll.

3. Describe the data requested indicating amount, type, by what medium the data will be provided, and whether the data recipient is granted access to the data warehouse or state archives.

   Data will be requested in a password protected excell spreadsheet format that will be stored on a password protected flash drive. Will also request access to the data warehouse or to have permission to work with another MDHHS employee (or a contractor working for MDHHS) who has access to the data warehouse to pull the needed data from the data warehouse.

Appendix G: (Continued)

Research Project: *Complete this box if requested data will be used for human subjects research.*

Is Institutional Review Board (IRB) (human subjects research) approval required?	☒ YES ☐ NO
If YES, MDHHS Approval Number ...... *(Attach MDHHS Approval Form)*	UT approved, MDHHS IRB Log # 201710-01-EA and 201710-01-EA-(R1)
Is HIPAA Informed Consent/Authorization Waiver Required?	☒ YES ☐ NO
If YES, MDHHS Approval Number (if above IRB approval not required)...... *(Attach HIPAA Waiver Authorization, if relevant.)*	Approval # 201710-01-EA and 201710-01-EA-(R1)

SECTION 2: AGREEMENT CONDITIONS

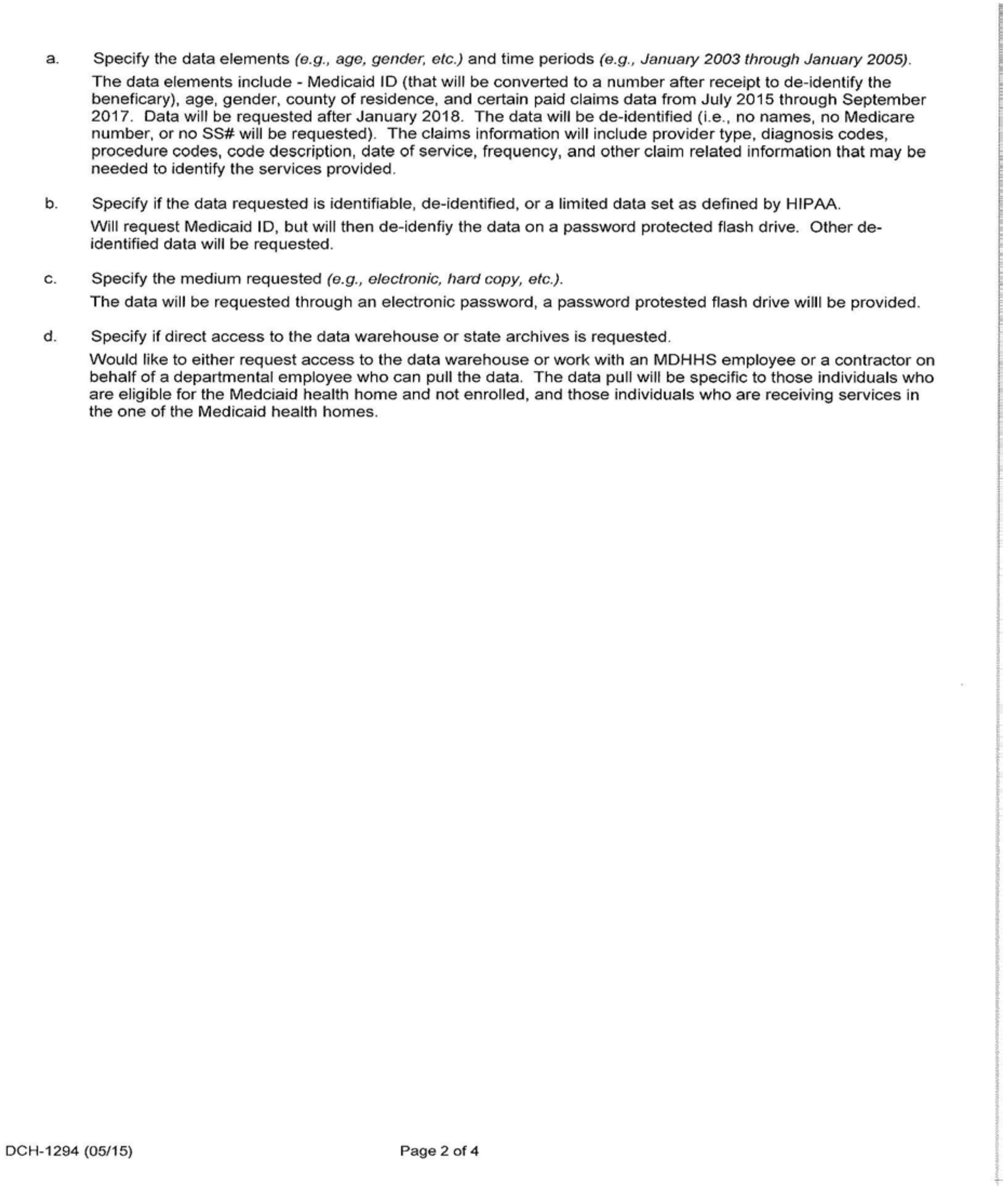
With regard to data provided under this agreement, the Data Recipient agrees to:

1. Use and disclose the data only in accordance with this agreement, or as otherwise required by law;
2. Limit access to these data only to those described and authorized in this agreement; *(MDHHS may require the specific identification of the person(s) or the agency/division/office that is permitted access. Identify if needed.)*
3. Use appropriate safeguards to prevent use or disclosure of the information other than as provided by this agreement; *(MDHHS sponsor may require description of the security procedures that will be in place and followed.)*
4. Report to the responsible MDHHS sponsor any use or disclosure of information that is not provided for by this data use agreement;
5. Ensure that any agent(s) or subcontractor(s) who access these data agree to the same restrictions and conditions that apply to the data recipient; *(MDHHS sponsor may stipulate that release of data to a subcontractor cannot be done without the written authorization of MDHHS.)*
6. Make no attempt to identify or contact the individuals, providers, or health plans within the data provided unless approved in this agreement; (*Describe any agreed upon exceptions if needed.)*
7. Data recipient must provide MDHHS at least thirty days to review and provide comments on papers, publications, or presentations that the data recipient plans to submit for publication or presentation. Data recipient agrees that it will not publish or disseminate any protected health information, personally identifiable information, or data that might make it possible, directly or indirectly, to identify an individual. Data recipient must acknowledge the MDHHS program as appropriate (e.g., source of data, etc.), assume full responsibility for the analysis and interpretation of the data, and provide a copy of the publication or presentation to MDHHS. To the extent data recipient requires technical assistance in analyzing or interpreting the data and when such assistance goes beyond providing non-manipulated data, MDHHS reserves the right to request that these activities be considered a substantial contribution to the research being conducted and that the provision of such assistance may warrant MDHHS be considered as a research collaborator or co-author in any resulting publications or presentations;
8. Return or destroy all originals and copies of any potentially identifiable information upon completion of project, or upon request, unless otherwise approved in this agreement. This includes, but is not limited to: magnetic tape, micro disk files, paper records, etc. If not returned to the MDHHS, then the data must be destroyed; e.g., use a CD/DVD shredder to destroy CD Roms, DVDs, etc., erase floppy/zip disks using a magnet, shred paper records, clean computer hard drives with a program designed to wipe a disk by overwriting, etc.;
9. Not use the data provided to engage in any method, act, or practice which constitutes a commercial solicitation or advertisement of goods, services, or real estate to consumers; and
10. Not use the data provided as a basis for legal, administrative or other actions which may affect particular individuals or establishments as a result of their specific identification in this project.

The MDHHS may cancel this agreement with proper notice.

The unauthorized use or disclosure of confidential information is punishable by imprisonment or fine or both under state and federal laws specific to the data released.

Appendix G: (Continued)



a. Specify the data elements *(e.g., age, gender, etc.)* and time periods *(e.g., January 2003 through January 2005)*.

The data elements include - Medicaid ID (that will be converted to a number after receipt to de-identify the beneficary), age, gender, county of residence, and certain paid claims data from July 2015 through September 2017. Data will be requested after January 2018. The data will be de-identified (i.e., no names, no Medicare number, or no SS# will be requested). The claims information will include provider type, diagnosis codes, procedure codes, code description, date of service, frequency, and other claim related information that may be needed to identify the services provided.

b. Specify if the data requested is identifiable, de-identified, or a limited data set as defined by HIPAA.

Will request Medicaid ID, but will then de-idenfiy the data on a password protected flash drive. Other de-identified data will be requested.

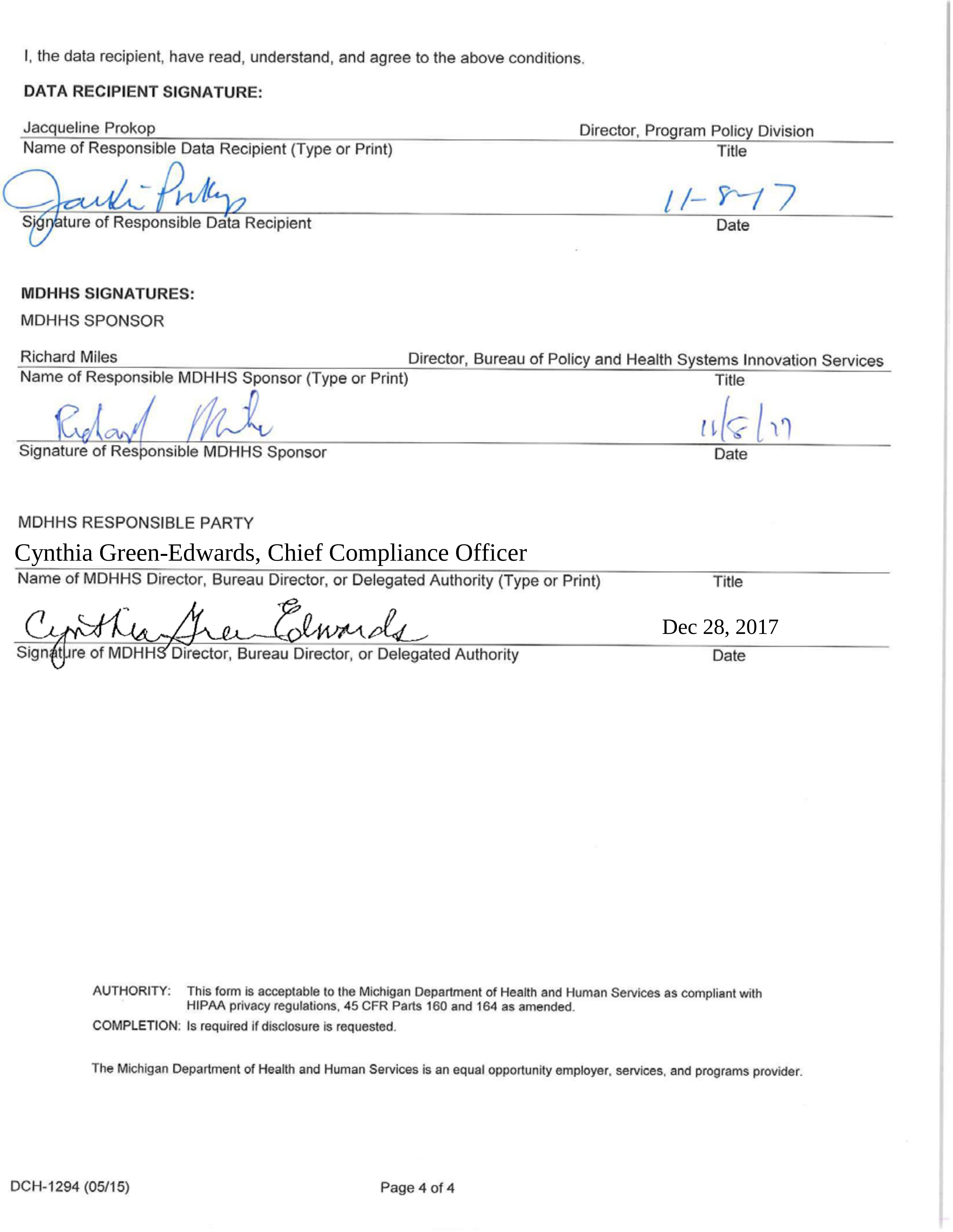
c. Specify the medium requested *(e.g., electronic, hard copy, etc.)*.

The data will be requested through an electronic password, a password protested flash drive willl be provided.

d. Specify if direct access to the data warehouse or state archives is requested.

Would like to either request access to the data warehouse or work with an MDHHS employee or a contractor on behalf of a departmental employee who can pull the data. The data pull will be specific to those individuals who are eligible for the Medciaid health home and not enrolled, and those individuals who are receiving services in the one of the Medicaid health homes.

Appendix G: (Continued)



I, the data recipient, have read, understand, and agree to the above conditions.

DATA RECIPIENT SIGNATURE:

Jacqueline Prokop	Director, Program Policy Division
Name of Responsible Data Recipient (Type or Print)	Title
Jacki Prokop	11-8-17
Signature of Responsible Data Recipient	Date

MDHHS SIGNATURES:

MDHHS SPONSOR

Richard Miles	Director, Bureau of Policy and Health Systems Innovation Services
Name of Responsible MDHHS Sponsor (Type or Print)	Title
Richard Miles	11/8/17
Signature of Responsible MDHHS Sponsor	Date

MDHHS RESPONSIBLE PARTY

Cynthia Green-Edwards, Chief Compliance Officer	
Name of MDHHS Director, Bureau Director, or Delegated Authority (Type or Print)	Title
Cynthia Green Edwards	Dec 28, 2017
Signature of MDHHS Director, Bureau Director, or Delegated Authority	Date

AUTHORITY: This form is acceptable to the Michigan Department of Health and Human Services as compliant with HIPAA privacy regulations, 45 CFR Parts 160 and 164 as amended.

COMPLETION: Is required if disclosure is requested.

The Michigan Department of Health and Human Services is an equal opportunity employer, services, and programs provider.

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Appendix H: List of CPT codes

CPT codes used for office visits - 99201-99205, 99211-99215, 99241-99245, 99385-99387, and 99395-99397.

CPT codes used to determine mental health office visits.

1996	90836	96103	99407
70555	90837	96116	G0480
80299	90838	96118	G0481
80305	90839	96119	G0482
80306	90840	96120	G0483
80307	90847	96127	H0001
90785	90853	96150	H0002
90791	90870	96151	H0004
90792	90887	96152	H0005
90832	90899	96153	H0015
90833	96101	96154	H0031
90834	96102	99406	H2011

Source: American Medical Association, (2017).

Appendix I: Pharmacy Prescriptions Drug Classification

Mental Health Medications

Drug Class	Medication Class
H20	ANTI-ANXIETY - BENZODIAZEPINES
H21	SEDATIVE-HYPNOTICS - BENZODIAZEPINES
H22	GENERAL ANESTHETICS,INJECTABLE-BENZODIAZEPINE TYPE
H22	GENERAL ANESTHETICS - BENZODIAZEPINE, INJECTABLE
H2A	CENTRAL NERVOUS SYSTEM STIMULANTS
H2B	GENERAL ANESTHETICS,INHALANT
H2C	GENERAL ANESTHETICS,INJECTABLE
H2D	BARBITURATES
H2E	SEDATIVE-HYPNOTICS,NON-BARBITURATE
H2F	ANTI-ANXIETY DRUGS
H2G	ANTI-PSYCHOTICS,PHENOTHIAZINES
H2G	ANTIPSYCHOTICS,PHENOTHIAZINES
H2H	MONOAMINE OXIDASE (MAO) INHIBITOR ANTIDEPRESSANTS
H2H	MONOAMINE OXIDASE (MAO) INHIBITORS
H2H	MONOAMINE OXIDASE(MAO) INHIBITORS
H2I	ANTI-PSYCHOTICS,PHENOTHIAZINES (CONTINUED 1)
H2I	ANTIPSYCHOTICS,PHENOTHIAZINES (CONTINUED 1)
H2J	ANTIDEPRESSANTS O.U.
H2K	ANTIDEPRESSANT COMBINATIONS O.U.
H2L	ANTI-PSYCHOTICS,NON-PHENOTHIAZINES
H2L	ANTIPSYCHOTICS,NON-PHENOTHIAZINES
H2M	ANTI-MANIA DRUGS
H2M	BIPOLAR DISORDER DRUGS
H2N	ANTIDEPRESSANTS O.U. (CONTINUED 1)
H2O	ANTI-PSYCHOTICS,NON-PHENOTHIAZINES (CONTINUED 1)
H2O	ANTIPSYCHOTICS,NON-PHENOTHIAZINES (CONTINUED 1)
H2P	ANTI-ANXIETY DRUGS (CONTINUED 1)
H2Q	SEDATIVE-HYPNOTICS,NON-BARBITURATE (CONTINUED 1)
H2S	SELECTIVE SEROTONIN REUPTAKE INHIBITOR (SSRIS)
H2U	TRICYCLIC ANTIDEPRESSANTS,REL.NON-SEL.REUPT-INHIB
H2U	TRICYCLIC ANTIDEPRESSANTS & REL. NON-SEL. RU-INHIB
H2V	TX FOR ATTENTION DEFICIT-HYPERACT(ADHD)/NARCOLEPSY
H2W	TRICYCLIC ANTIDEPRESSANT-PHENOTHIAZINE COMBINATNS
H2W	TRICYCLIC ANTIDEPRESSANT/PHENOTHIAZINE COMBINATNS
H2X	TRICYCLIC ANTIDEPRESSANT-BENZODIAZEPINE COMBINATNS
H2X	TRICYCLIC ANTIDEPRESSANT/BENZODIAZEPINE COMBINATNS

Appendix I: (Continued)

Drug Class	Medication Class
H2Y	TRICYCLIC ANTIDEPRESSANT-NON-PHENOTHIAZINE COMB.
H2Y	TRICYCLIC ANTIDEPRESSANT/NON-PHENOTHIAZINE COMB.
H2Z	BENZODIAZEPINE ANTAGONISTS
H7O	ANTIPSYCHOTICS,DOPAMINE ANTAGONISTS,BUTYROPHENONES
H7P	ANTIPSYCHOTICS,DOPAMINE ANTAGONISTS, THIOXANTHENES
H7Q	ANTIPSYCHOTICS, DOPAMINE ANTAGONISTS, BENZAMIDES
H7R	ANTIPSYCH,DOPAMINE ANTAG.,DIPHENYLBUTYLPIPERIDINES
H7S	ANTIPSYCHOTICS,DOPAMINE ANTAGONST,DIHYDROINDOLONES
H7T	ANTIPSYCHOTIC,ATYPICAL,DOPAMINE,SEROTONIN ANTAGNST
H7T	ANTIPSYCHOTICS,ATYPICAL,DOPAMINE,& SEROTONIN ANTAG
H7U	ANTIPSYCHOTICS, DOPAMINE & SEROTONIN ANTAGONISTS
H7U	ANTIPSYCHOTICS, DOPAMINE AND SEROTONIN ANTAGONISTS
H7V	ANTIPSYCH,DOPAMINE ANTAGONISTS,IMINODIBENZYL DER.
H7W	ANTI-NARCOLEPSY & ANTI-CATAPLEXY,SEDATIVE-TYPE AGT
H7W	ANTI-NARCOLEPSY,ANTI-CATAPLEXY,SEDATIVE-TYPE AGENT
H7X	ANTIPSYCHOTICS, ATYP, D2 PARTIAL AGONIST/5HT MIXED
H7Z	SSRI &ANTIPSYCH,ATYP,DOPAMINE&SEROTONIN ANTAG COMB
H7Z	SSRI & ANTIPSYCH,ATYP,DOPAMINE&SEROTONIN ANTAG CMB
H7Z	SSRI-ANTIPSYCH, ATYPICAL,DOPAMINE,SEROTONIN ANTAG
H8A	ANTI-ANXIETY (ANXIOLYTIC) AND ANTISPASMODIC COMB.
H8A	ANTI-ANXIETY(BENZODIAZEPINE)AND ANTISPASMODIC COMB
H8B	HYPNOTICS, MELATONIN MT1/MT2 RECEPTOR AGONISTS
H8C	HYPNOTICS, MELATONIN, SINGLE AGENTS
H8D	HYPNOTICS, MELATONIN AND HERBAL COMBINATIONS
H8E	HYPNOTICS,MELATONIN-NON-SALICYLATE ANALGESIC COMB
H8E	HYPNOTICS, MELATONIN &NON-SALICYLATE ANALGESIC CMB
H8F	HYPNOTICS, MELATONIN COMBINATIONS OTHER
H8G	SEDATIVE-HYPNOTICS,NON-BARBITURATE/DIETARY SUPP.
H8N	TCA/ANTIPSYCH,DOPAMINE ANTAG.THIOXANTHENE COMB
H8N	TCA-ANTIPSYCHOTIC,DOPAMINE ANTAG.THIOXANTHENE CMBS
H8P	SSRI AND 5HT1A PARTIAL AGONIST ANTIDEPRESSANTS
H8P	SSRI & 5HT1A PARTIAL AGONIST ANTIDEPRESSANT
H8Q	NARCOLEPSY AND SLEEP DISORDER THERAPY AGENTS
H8R	BENZODIAZEPINES
H8S	ANTIDEPRESSANTS O.U. (CONTINUED 2)
H8T	SSRI, SEROTONIN RECEPTOR MODULATOR ANTIDEPRESSANTS

Appendix I: (Continued)

Drug Class	Medication Class
H8T	SSRI & SEROTONIN RECEPTOR MODULATOR ANTIDEPRESSANT
H8U	CANNABIS AND CANNABINOID RECEPTOR AGONISTS
H8V	HSDD AGENTS-MIXED SEROTONIN AGONIST/ANTAGONISTS
H8W	ANTIPSYCHOTIC-ATYPICAL,D3/D2 PARTIAL AG-5HT MIXED
H2I	ANTI-PSYCHOTICS,PHENOTHIAZINES (CONTINUED 1)
H2I	ANTIPSYCHOTICS,PHENOTHIAZINES (CONTINUED 1)
H2J	ANTIDEPRESSANTS O.U.
H2K	ANTIDEPRESSANT COMBINATIONS O.U.
H2L	ANTI-PSYCHOTICS,NON-PHENOTHIAZINES
H2L	ANTIPSYCHOTICS,NON-PHENOTHIAZINES
H2M	ANTI-MANIA DRUGS
H2M	BIPOLAR DISORDER DRUGS
H2N	ANTIDEPRESSANTS O.U. (CONTINUED 1)
H2O	ANTI-PSYCHOTICS,NON-PHENOTHIAZINES (CONTINUED 1)
H2O	ANTIPSYCHOTICS,NON-PHENOTHIAZINES (CONTINUED 1)
H2P	ANTI-ANXIETY DRUGS (CONTINUED 1)
H2Q	SEDATIVE-HYPNOTICS,NON-BARBITURATE (CONTINUED 1)
H2R	ANTI-PRURITICS (SYSTEMIC)
H2S	SELECTIVE SEROTONIN REUPTAKE INHIBITOR (SSRIS)

Hypertension Medications

Drug Class	Medication Class
A4A	ANTIHYPERTENSIVES, VASODILATORS
A4B	ANTIHYPERTENSIVES, SYMPATHOLYTIC
A4C	ANTIHYPERTENSIVES, GANGLIONIC BLOCKERS
A4D	ANTIHYPERTENSIVES, ACE INHIBITORS
A4E	ANTIHYPERTENSIVES, VERATRUM ALKALOIDS
A4F	ANTIHYPERTENSIVES, ANGIOTENSIN RECEPTOR ANTAGONIST
A4G	ANTIHYPERTENSIVES,ACE INHIBITOR/DIETARY SUPP.COMB.
A4H	ANGIOTENSIN RECEPTOR BLOCKR-CALCIUM CHANNEL BLOCKR
A4H	ANGIOTENSIN RECEPTOR ANTGNST & CALC.CHANNEL BLOCKR
A4I	ANGIOTENSIN RECEPTOR ANTAG.-THIAZIDE DIURETIC COMB
A4I	ANGIOTENSIN RECEPTOR ANTAG./THIAZIDE DIURETIC COMB
A4J	ACE INHIBITOR/THIAZIDE & THIAZIDE-LIKE DIURETIC
A4J	ACE INHIBITOR-THIAZIDE OR THIAZIDE-LIKE DIURETIC
A4K	ACE INHIBITOR-CALCIUM CHANNEL BLOCKER COMBINATION
A4K	ACE INHIBITOR/CALCIUM CHANNEL BLOCKER COMBINATION
A4L	ANGIOTENSIN RECEPT-NEPRILYSIN INHIBITOR COMB(ARNI)

Appendix I: (Continued)

Drug class	Medication Class
A4M	ACE INHIB-THIAZIDE DIURETIC-CALCIUM CHANNEL BLOCKR
A4N	ANGIOTENSIN II RECEPTOR BLOCKER-BETA BLOCKER COMB.
A4O	CALCIUM CHANNEL BLOCKER-THIAZIDE OR RELATED COMBO.
A4T	RENIN INHIBITOR, DIRECT
A4U	RENIN INHIBITOR,DIRECT AND THIAZIDE DIURETIC COMB
A4U	RENIN INHIBITOR, DIRECT/THIAZIDE DIURETIC COMB
A4V	ANGIOTEN.RECEPTR ANTAG-CALCIUM CHANL BLKR-THIAZIDE
A4V	ANGIOTEN.RECEPTR ANTAG./CAL.CHANL BLKR/THIAZIDE CB
A4W	RENIN INHIBITOR,DIRECT-ANGIOTENSIN RECEPTR ANTAGON
A4W	RENIN INHIBITOR,DIRECT & ANGIOTENSIN RECEPT ANTAG.
A4X	RENIN INHIBITOR, DIRECT & CALCIUM CHANNEL BLOCKER
A4X	RENIN INHIBITOR,DIRECT AND CALCIUM CHANNEL BLOCKER
A4Y	ANTIHYPERTENSIVES, MISCELLANEOUS
A4Z	RENIN INHIB, DIRECT& CALC.CHANNEL BLKR & THIAZIDE
A4Z	RENIN INHIB, DIRECT/CALC. CHANNEL BLKR/THIAZIDE CB
A4Z	RENIN INHIB,DIRECT-CALCIUM CHANNEL BLOCKR-THIAZIDE

Asthma Medications

Drug class	Medication Class
A1D	GENERAL BRONCHODILATOR AGENTS
A1E	XANTHINES/DIETARY SUPPLEMENT COMBINATIONS
B6M	GLUCOCORTICOIDS, ORALLY INHALED
B6W	BETA-ADRENERGIC AGENTS, INHALED, SHORT ACTING
B6Y	BETA-ADRENERGIC AGENTS, ORALLY INHALED,LONG ACTING
J5G	BETA-ADRENERGIC AND GLUCOCORTICOID COMBINATIONS
B61	ANTICHOLINERGICS, ORALLY INHALED LONG ACTING
B62	BETA-ADRENERGIC AND ANTICHOLINERGIC COMBO, INHALED
B63	BETA-ADRENERGIC AND GLUCOCORTICOID COMBO, INHALED

Opioid Medications

Drug class	Medication Class
H3A	ANALGESICS, NARCOTICS
H3M	NARCOTIC,NON-SALICY.ANALGESIC,BARBITURATE,XANTHINE
H3N	ANALGESICS, NARCOTIC AGONIST AND NSAID COMBINATION
H3U	NARCOTIC ANALGESIC & NON-SALICYLATE ANALGESIC COMB
H3X	NARCOTIC AND SALICYLATE ANALGESIC COMBINATION
H3Z	NARCOTIC ANALGESIC,NON-SALICYLATE,XANTHINE COMB

Appendix I: (Continued)

Diabetes Medications

Drug class	Medication Class
C4A	ANTIHYPERGLY.DPP-4 INHIBITORS &HMG COA RI(STATINS)
C4A	ANTIHYPERGLY. DPP-4 INHIBITORS-HMG COA RI(STATINS)
C4B	ANTIHYPERGLYCEMIC-GLUCOCORTICOID RECEPTOR BLOCKER
C4C	ANTIHYPERGLY,DPP-4 ENZYME INHIB &THIAZOLIDINEDIONE
C4C	ANTIHYPERGLY,DPP-4 ENZYME INHIB.-THIAZOLIDINEDIONE
C4D	ANTIHYPERGLYCEMC-SOD/GLUC COTRANSPORT2(SGLT2)INHIB
C4E	ANTIHYPERGLYCEMIC-SGLT2 INHIBITOR & BIGUANIDE COMB
C4E	ANTIHYPERGLYCEMIC-SGLT2 INHIBITOR-BIGUANIDE COMBS.
C4F	ANTIHYPERGLY, (DPP-4) INHIBITOR & BIGUANIDE COMB.
C4F	ANTIHYPERGLYCEMIC,DPP-4 INHIBITOR-BIGUANIDE COMBS.
C4F	ANTIHYPERGLYCEMIC,DPP-4 INHIBITOR & BIGUANIDE COMB
C4G	INSULINS
C4H	ANTIHYPERGLYCEMIC, AMYLIN ANALOG-TYPE
C4I	ANTIHYPERGLY,INCRETIN MIMETIC(GLP-1 RECEP.AGONIST)
C4J	ANTIHYPERGLYCEMIC, DPP-4 INHIBITORS
C4K	ANTIHYPERGLYCEMIC, INSULIN-RELEASE STIMULANT TYPE
C4L	ANTIHYPERGLYCEMIC, BIGUANIDE TYPE
C4L	ANTIHYPERGLYCEMIC,BIGUANIDE TYPE(NON-SULFONYLUREA)
C4M	ANTIHYPERGLYCEMIC, ALPHA-GLUCOSIDASE INHIBITORS
C4M	ANTIHYPERGLYCEMIC, ALPHA-GLUCOSIDASE INHIB (N-S)
C4N	ANTIHYPERGLYCEMIC,THIAZOLIDINEDIONE(PPARG AGONIST)
C4N	ANTIHYPERGLYCEMIC, INSULIN-RESPONSE ENHANCER (N-S)
C4O	ANTIHYPERGLYCEMIC, ABSORPTION MODIFIER,UNSPECIFIED
C4P	ANTIHYPERGLYCEMIC, UNSPECIFIED MECHANISM
C4Q	ANTIHYPERGLYCEMIC COMBINATIONS
C4R	ANTIHYPERGLYCEMIC, THIAZOLIDINEDIONE-SULFONYLUREA
C4R	ANTIHYPERGLYCEMIC,THIAZOLIDINEDIONE & SULFONYLUREA
C4R	ANTIHYPERGLYCEMIC,INSULIN-RESPONSE & RELEASE COMB.

Appendix I: (Continued)

Drug class	Medication Class
C4S	ANTIHYPERGLYCEMIC,INSULIN-RELEASE STIM.-BIGUANIDE
C4S	ANTIHYPERGLYCEMIC,INSULIN-REL STIM.& BIGUANIDE CMB
C4T	ANTIHYPERGLYCEMIC,THIAZOLIDINEDIONE & BIGUANIDE
C4T	ANTIHYPERGLYCM,INSUL-RESP.ENHANCER & BIGUANIDE CMB
C4T	ANTIHYPERGLYCEMIC,INSULIN-RESP.ENHANCER& BIGUANIDE
C4T	ANTIHYPERGLYCEMIC, THIAZOLIDINEDIONE AND BIGUANIDE
C4U	ANTIHYPERGLYCEMIC, BIGUANIDE-DIETARY SUPPL. COMB.
C4U	ANTIHYPERGLYCEMIC, BIGUANIDE & DIETARY SUPP.COMB.
C4V	ANTIHYPERGLYCEMIC - DOPAMINE RECEPTOR AGONISTS
C4W	ANTIHYPERGLYCEMIC, SGLT-2 AND DPP-4 INHIBITOR COMB
C4W	ANTIHYPERGLYCEMIC, SGLT-2 & DPP-4 INHIBITOR COMB.
C4X	ANTIHYPERGLYCEMIC ,INSULIN & GLP-1 RECEPTOR AGONIST
C4X	ANTIHYPERGLY, INSULIN,LONG ACT-GLP-1 RECEPT.AGONIST
Y9A	DIABETIC SUPPLIES
Y9B	DIABETIC SUPPLIES (CONTINUED 1)

Source: FDA Pharmacologic Class (2018).

Biographical Sketch

NAME: Prokop, Jacqueline Sue

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Doctoral Candidate, The University of Texas at Tyler, College of Nursing and Health Sciences, Tyler, TX, 75799

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Michigan State University, College of Nursing, Lansing, MI	BSN	06/1989	Nursing
University of Phoenix, Phoenix AZ	MHA	01/2008	Healthcare Administration
The University of Texas at Tyler, Tyler, TX	PhD	08/2018	Nursing

A. Personal Statement

My research interests include health policy and organizational leadership in improving how health care is delivered to individuals with chronic conditions. Improving health care system delivery and health care financing mechanisms to support this care is central to the health policy I wish to continue to pursue.

B. Positions and Honors

Positions and Employment

1989 – 1994: Thoracic Surgical RN, Ingham Medical Hospital, Lansing, MI
1993 – 2002: Home care staff RN, Kimberly Quality Care home nursing care, Lansing, MI
1993 – Present – Michigan Department of Health and Human Services
    1993 – 2003: Medicaid quality and utilization analyst, Lansing, MI
    2003 – 2010: Health policy and federal waiver specialist
    2010 – Present: Director, Program Policy Division
2002 – 2007: Undergraduate Teaching Assistant, Michigan State University, College of Nursing, East Lansing, MI

Other Experience and Professional Memberships

2016 – Present: Member, Sigma Theta Tau International Honor Society in Nursing
2016 – Present: Member, Phi Kappa Phi Honor Society
2016 – Present: Member, The National Society of Leadership and Success

Honors

2014: Directors Award, Michigan Department of Health and Human Services
2016: Michigan Primary Care Association Legacy Award.
2017: Directors Award, Michigan Department of Health and Human Services

C. Contribution to Science

1. I currently have two articles that were published. The focus of the articles is improving how the health care delivery system coordinates and provides services. The intent of the articles is to better understand the nurse’s role in health care delivery and connecting with the patient. Our health care system is very complex and when someone has a chronic condition, navigating their way through this complexity can be a challenge. Nurses can be leaders in helping to improve how health care is delivered and improving patient outcomes.

Prokop, J. (2016). Care coordination strategies in reforming health care: A concept analysis. *Nursing Forum*, *51*(4), 268-274.

Prokop, J., LaPres, M., Barron, B., & Villasurda, J. (2018). Implementing a Health Home: Michigan's Experience. *Policy, Politics & Nursing Practice*, 1527154417749849. doi:10.1177/1527154417749849