

NON-PSYCHIATRIC HOSPITALIZATION FOR PATIENTS WITH PSYCHOTIC DISORDERS: A

MIXED-METHODS STUDY

Guy M. Weissinger II

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Supervisor of Dissertation

Graduate Group Chairperson

Bridgette Brawner, PhD, MDiv, APRN

Associate Professor of Nursing

Nancy Hodgson, PhD, RN, FAAN

Associate Professor of Nursing

Dissertation Committee:

J. Margo Brooks Carthon, PhD, RN, FAAN, Associate Professor of Nursing

Michael B. Blank, PhD, Professor of Psychology in Medicine

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DEDICATION

To my husband. To my family. To my friends. To everyone who has walked with me
through this journey.

“Standing on the parted shores of history
we still believe what we were taught
before ever we stood at Sinai's foot;
that wherever we go, it is eternally Egypt
that there is a better place, a promised land;
that the way to that promise passes through the wilderness.
That there is no way to get from here to there
except by joining hands, marching together.”

From *Mishkan T'Filah*

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Finally, to my husband, I'm sorry about all this. I promise: no more degrees.

ABSTRACT

NON-PSYCHIATRIC HOSPITALIZATION FOR PATIENTS WITH PSYCHOTIC DISORDERS: A MIXED-METHODS STUDY

Guy M. Weissinger II

Bridgette M. Brawner, MDiv, PhD, APRN

Patients with psychotic disorders face a multitude of medical health disparities in addition to psychological symptoms. They have a higher medical disease burden than the general population and are more likely to have a non-psychiatric hospitalization. In the hospital, these patients have an increased risk of adverse events, readmission and extended length-of-stay. Working with a Health Equity lens and the Quality Health Outcomes Model, we reviewed the literature on adverse events during medical-surgical hospitalizations for these patients and identified differences at the patient, provider and system levels between these patients and the general population. Next, a mixed methods, exploratory sequential study was conducted to: 1) explore the experience of patients with psychotic disorders hospitalized on medical-surgical unit; 2) examine patient characteristics and care processes associated with length-of-stay (primary outcome), adverse events and readmissions (secondary outcomes), among patients with psychotic disorders during non-psychiatric hospitalizations; and 3) integrate qualitative and quantitative data to contextualize factors associated with hospital outcomes among patients with psychotic disorders during non-psychiatric hospitalizations. For Phase 1, interviews were conducted with twenty patients with psychotic disorders on medical-surgical units. Five themes were developed through thematic analysis: 1) *managing*

through hard times, 2) ignored and treated unfairly, 3) actively involved in health, 4) appreciation of caring providers and 5) violence: expected and experienced. In Phase 2, information from these interviews guided variable selection for an analysis of patient hospital records. A general linear model was conducted to examine length-of-stay's relationship with patient characteristics and care processes. Of patient characteristics, only medical comorbidities were significantly related to length-of-stay. Certain processes of care highlighted by patients from the qualitative sample were found to be associated with length-of-stay like physical restraints (64% longer), psychiatrist consult (20% longer) and outpatient appointment in the previous six months (10% shorter). Results suggest specific patient characteristics and care processes are highly related to length-of-stay and that many of these were important to the patients in the qualitative portion. The use of mixed methods research for hospital outcomes research in this population creates valuable information for educational and clinical settings to improve care for patients with psychotic disorders.

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CHAPTER 1:
BACKGROUND AND INTRODUCTION TO PROBLEM

The Issue

Psychotic disorders are a set of psychiatric disorders characterized by hallucinations, delusions and/or disorganized thoughts (APA, 2013). Individuals with psychotic disorders experience a myriad of psychological and cognitive symptoms including depression, mania, avolition and affective flattening (APA). These symptoms contribute to an overall deficit in life functioning and activities of daily living with profound effect (APA). In the United States, more than 22 million people meet criteria for at least one psychotic disorder (Kessler et al., 2005; McGrath, Saha, Chant, & Welham, 2008; Messias, Chen, & Eaton, 2007), with a lifetime prevalence of approximately twice that number (Kendler, Gallagher, Abelson, & Kessler, 1996; Kessler et al., 2005). Psychotic disorders wax and wane in their symptomology, but tend to be chronic and are associated with disability (Gureje, Herrman, Harvey, Morgan, & Jablensky, 2002) and decreased quality of life (Galuppi, Turola, Nanni, Mazzoni, & Grassi, 2010).

In addition to their psychological symptoms, people with psychotic disorder also experience higher rates of many acute and chronic medical conditions than the general population (Crump, Winkleby, Sundquist, & Sundquist, 2013; Laursen, Munk-Olsen, & Gasse, 2011). The mechanisms of these disparities are poorly understood but known to be complex. They have been linked to various causes such as high rates of tobacco use (Callaghan et al., 2014), obesity (Depp et al., 2014), the metabolic side effects of antipsychotic medications (Correll, Detraux, De Lepeleire, & De Hert, 2015) and social marginalization experienced by these individuals (Lawrence & Kisely, 2010). Regardless of the mechanism, these health disparities contribute to a 22-year shorter life expectancy

for these individuals than their age cohorts (Laursen, Nordentoft, & Mortensen, 2014; Nordentoft et al., 2013).

These chronic and acute medical conditions are also a contributing factor in the increased rate of non-psychiatric hospitalizations experienced by individuals with psychotic disorders compared to the general population (Cahoon, McGinty, Ford, & Daumit, 2013; Davydow et al., 2016). Once hospitalized, these patients experience a new set of disparities, hospital outcome disparities. These include longer length-of-stay (Daumit et al., 2006; Khaykin, Ford, Pronovost, Dixon, & Daumit, 2010) and increased higher risk of adverse events and 30-day readmission compared to other patients (Chua-Tuan, 2013; Chwastiak et al., 2014; Daumit et al., 2006; Davydow et al., 2016). With a better understanding of the factors that drive these poor hospital outcomes, we can develop interventions to protect this vulnerable population in the hospital and reduce a significant burden on the healthcare system.

Significance

There are only 22-23 million people in the United States with psychotic disorders, yet medical care for these individuals has a large economic impact on individuals and the healthcare system. The total economic burden of schizophrenia in the United States, just one psychotic disorder, is estimated to be \$156 billion a year (Cloutier et al., 2016). These individuals account for over \$11.5 billion of direct Medicare expenses every year (Feldman, Bailey, Muller, Le, & Dirani, 2014) and non-psychiatric hospitalizations are a large part of these costs (2014). During an individual hospital stay, the costs for a patient with a psychotic disorder are higher than for other patients (Hendrie et al., 2014; Sayers et al., 2007). Much of this increased cost of hospitalizations appears to be associated with these patients' increased length-of-stay and higher rate of adverse events during non-

psychiatric hospitalizations (Daumit et al., 2006; Sayers et al., 2007). Because of the changes in reimbursement laws and service bundling in the United States (UDHHS, 2007), some of the hospitalization costs of these patients are born by public or private insurance programs but hospitals and individuals face much of the economic burden of the poor hospital outcomes experienced by these patients (Foster & Harkness, 2010).

In addition to the economic impact of poor hospital outcomes, poor hospital outcomes experienced by patients with psychotic disorders create a burden for healthcare staff and systems. In the inpatient medical-surgical setting, nurses report feeling overwhelmed working with patients with serious mental illnesses like psychotic disorders (Alexander, Ellis, & Barrett, 2016; Björkman, Angelman, & Jönsson, 2008). Healthcare providers, especially nurses, have significant stigma towards patients with psychotic disorders (Hanzawa et al., 2012; Serafini et al., 2011) and they report that they do not have the proper training and knowledge to deliver care to these patients (Happell, Platania-Phung, & Scott, 2013; Zolnieriek & Clingerman, 2012). These feelings of being unprepared may contribute to feelings of burnout and lack of control that many nurses feel and is associated with poor patient outcomes (McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011) and nurse job instability (Han, Trinkoff, & Gurses, 2015). If nurses and other providers are uncomfortable providing care and do not feel prepared to do so, they may deliver poor quality care to patients. As quality of inpatient care is critical to hospital outcomes (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Lucero, Lake, & Aiken, 2009), it is imperative that we understand what factors, both modifiable and nonmodifiable, are associated with poor hospital outcomes so that nurses and other

providers can work to reduce the high rate of poor hospital outcomes experienced by these patients.

Disparities in Hospital Outcomes

Hospital outcomes are measurable events that can be used to better understand the effects of hospital care, system factors and patient characteristics on patients. Three of the most common hospital outcomes considered are length-of-stay, adverse events and readmissions. Length-of-stay, the time from hospital admission to discharge to home or to another facility, is an important factor in understanding the quality, cost and experience of hospitalization (Svendsen, Ehlers, Andersen, & Johnsen, 2009). A certain amount of time in the hospital is necessary for successful treatment but too much time in the hospital is associated with high rates of adverse events like hospital-acquired infections, pressure ulcers and medication errors (Hauck & Zhao, 2011). After an adverse event, patients often require even more time in the hospital to address the new problems that arise in addition to the original reason for hospitalization (Hoogervorst-Schilp, Langelaan, Spreeuwenberg, de Bruijne, & Wagner, 2015; Zhan & Miller, 2003). Conversely, too short of a length-of-stay may lead to patients being discharged before they are medically stabilized or properly educated to care for themselves outside of the hospital environment (Kaboli et al., 2012).

When comparing patients with psychotic disorders to those without any mental illness, median hospital length-of-stay is 0.8-2 days longer (Daumit et al., 2006; Khaykin et al., 2010) and average length-of-stay ranges from 0.6 to 15.4 days longer (Buller, Best, Klika, & Barsoum, 2015; Liao, Shen, Chang, Chang, & Chen, 2013; Smith, Zhao, & Rosen, 2012). Additionally, they experience higher variation in length-of-stay compared to patients without mental illness (Bot, Menendez, Neuhaus, & Ring, 2014; Buller et al.,

2015; Liao et al., 2013). For example, in one study by Menendez, Neuhaus, Bot, Ring, and Cha (2014), patients receiving spinal surgery with a psychotic disorder had a length-of-stay standard deviation of 21 days compared to 7.6 days for other patients.

Understanding what factors drive both this overall increased length-of-stay as well, as identifying which patients are at risk of longer length-of-stay, may help to reduce time spent in the hospital and decrease the prevalence of other poor hospital outcomes.

Adverse events are often closely associated with length-of-stay (Hoogervorst-Schilp et al., 2015) and overall quality of hospital care (de Vries, Ramrattan, Smorenburg, Gouma, & Boermeester, 2008). Defined as “an event...that caused harm to a patient as a result of medical care. This includes never events; hospital-acquired conditions; events that required life-sustaining intervention; and events that caused prolonged hospital stays, permanent harm, or death” (Department of Health and Human Services, 2017, Table 1). They are a useful indicator of the quality of hospital care because individuals who experience adverse events often have detectable deficits in care or issues like extended length-of-stay (de Vries et al., 2008). Most, though likely not all, hospitalization-related adverse events are preventable with appropriate assessment and delivery of medical and nursing care.

Adverse events continue to be an issue faced by healthcare systems around the world (Aranaz-Andrés et al., 2009; Ehsani, Jackson, & Duckett, 2006). In the United States, almost 14% of non-psychiatric hospitalizations have an adverse event (Levinson & General, 2010). Patients with psychotic disorders, though, experience an even higher risk of adverse events. For example, compared to the general population of patients, they have a 20-150% higher rate of hospital-acquired infections (Daumit et al., 2006; Khaykin et

al., 2010) and 43% higher risk of pressure ulcers (Khaykin et al., 2010). Post-surgically, they have a 200% higher rate of pneumonia (Liao et al., 2013) and 90% higher rate of deep vein thrombosis (DVT; Daumit et al., 2006). They also experience more unanticipated increases in care severity, such as more blood transfusions, intensive care unit (ICU) admissions and pulmonary failure leading to intubation for mechanical ventilation (Buller et al., 2015; Gholson et al., 2018; Klement et al., 2016; Menendez et al., 2014). The higher rate of adverse events these patients experience indicate that there are differences at some level that makes these patients different and puts them at such increased risk.

Finally, hospital readmissions are an important measure of hospital care quality (Dimick & Ghaferi, 2015) that indicates that patients with psychotic disorders may be experiencing deficits in care. Unplanned readmissions to the hospital are an important measure of quality because they indicate a possible deficit in discharge education or treatment that did not prepare the patient for the transition to home or another institution. Thus, readmissions have been found to be related to deficits in delivery of direct care (Tsai, Joynt, Orav, Gawande, & Jha, 2013), poor discharge planning (Shepperd et al., 2013) and both individual and systemic problems in the transition to home or other facility (Jackson, Trygstad, DeWalt, & DuBard, 2013). Patients with psychotic disorders experience a 18-30% higher rate of 30-day readmissions than the general population of patients (Chwastiak et al., 2014; Davydow et al., 2016; Singh, Zhang, Kuo, & Sharma, 2016). Readmissions are now linked to hospital reimbursement in an attempt to increase patient care quality and decrease readmission frequency (CMS, 2018). Understanding

what patients are at highest risk for readmission thus has become important not only to patient care but to the financial stability of hospitals and healthcare systems.

Length-of-stay, while affected by adverse events, also affects the rate of the poor outcomes experienced by patients with psychotic disorders during non-psychiatric hospitalizations. The longer a patient stays in the hospital, the more likely they are to experience adverse events like pressure ulcers and medication errors. Too short of length-of-stay may make discharge planning difficult and too long may contribute to decrease functional status that contribute to readmissions. Unfortunately, without a greater understanding of the disparities in hospital outcomes and what contributes to them, patients with psychotic disorders will continue to have poor hospital outcomes. Their pain and disability from preventable adverse events and rehospitalization, as well as the cost of care borne by this vulnerable population and the entire healthcare system, will continue to increase. Only by increasing our knowledge of these patients' hospitalizations can effective interventions be developed.

Review of Related Literature

Hospital outcomes are complex, multi-faceted and affected by patient-, process- and system-level factors in an intersectional manner. Like many problems in the medical system, poor hospital outcomes do not occur at the same rate in all populations. Certain groups, like racial/ethnic minorities, are more likely to receive care in poorer quality hospitals and healthcare systems (Joynt, Orav, & Jha, 2011). In these lower quality hospitals, these patients are likely to receive worse care and end up with worse outcomes than other patients in higher quality hospitals (Carthon et al., 2012; Joynt et al., 2011; Khera, Vaughan-Sarrazin, Rosenthal, & Girotra, 2015). For the populations that experience hospital outcome disparities, patient, process and system factors all contribute

to the worse outcomes they experience; only by understanding how these factors contribute to the disparities they experience can targeted interventions be deployed to ameliorate these disparities. While knowledge of factors associated with poor hospital outcomes for patients with psychotic disorders is limited, a larger body of evidence exists from which inferences can be drawn to the proposed research.

Inferences from Related Populations and Settings

Research outside of the non-psychiatric hospital setting, including primary care and psychiatric care, for individuals with psychotic disorders indicate that factors at the individual, system and process level may predispose them to poor hospital outcomes. First, there are within group differences amongst those who have psychotic disorders. Schizophrenia in particular is associated with high levels of psychiatric symptoms (APA, 2013), cognitive deficits (Bora, Yucel, & Pantelis, 2009) and impaired functional status (Bowie et al., 2010) when compared to both mood disorders and other psychotic disorders. Their difficulty engaging effectively with providers due to flat affect and avolition (APA, 2013) may make providers less willing to discharge them in a timely manner or have a support network who can help them manage transitions. As functional and cognitive status are predictive of readmissions (Kitamura et al., 2017), these patients may be at higher risk of poor hospital outcomes even compared to other patients with psychotic disorders.

Certain patients with psychotic disorders may also have restraints used on them during their time in the hospital, due to a wide variety of factors. Patients with psychotic disorders are more prone to post-surgical delirium (Kudoh, Takase, Takahira, Katagai, & Takazawa, 2003) and seen as violent by healthcare providers (Roche, Diers, Duffield, &

Catling-Paull, 2010), both of which may result in the use of restraints to “protect” the patient or staff. Unfortunately, restraints, either chemical or physical, contribute to extended length-of-stay (Bai et al., 2014) and hospitalization adverse events (Barnett, Stirling, & Pandyan, 2012). As they are more likely to experience use of physical and chemical restraints than other patients during non-psychiatric hospitalizations (X*), the use of restraints may drive some of the disparities in outcomes experience by patients with psychotic disorders.

Outside of the hospital, patients with psychotic disorders also experience worse outcomes and deficits in care that are relevant to consider when seeking to understand their hospital outcomes. Overall, patients with psychotic disorders have a high rate of general mortality compared to the general population, contributing to an 8-22 year lower life-expectancy (Bitter et al., 2017; Laursen et al., 2014). Though consistent primary care is associated with decreased mortality for people with psychotic disorders (Copeland et al., 2009), they are less likely to have a primary care provider and be actively engaged in care than the general population (Crawford et al., 2014; Hippisley-Cox, Parker, Coupland, & Vinogradova, 2007). Without adequate primary care, these individuals will have less access to preventative services and may enter the hospital sicker than other patients who have been working with their healthcare providers to manage their illnesses and comorbidities.

Even when involved in outpatient primary care, people with psychotic disorders do not receive the same treatment and assessment as other patients. They are less likely to have standard health assessments performed, including blood pressure, cholesterol or smoking status (Nasrallah et al., 2006; Roberts, Roalfe, Wilson, & Lester, 2006).

Possibly because of deficits in assessment, they are also less likely to receive standard-of-care treatment for chronic conditions frequently managed in outpatient primary care settings such as diabetes and hypertension (Nasrallah et al., 2006; Sernyak, Gulanski, Leslie, & Rosenheck, 2003). In addition to missed care and assessment, these patients are often frustrated with their care providers, who they feel do not take their medical needs seriously, which may contribute to their reported difficulty forming cooperative provider-patient relationships (Lester, Tritter, & England, 2003). These deficits in care and forming relationships with providers that these patients experience in the outpatient setting has not been found in the non-psychiatric hospital settings but may be an important part of conceptualizing and studying the disparities they experience.

In addition to this literature on patients with psychotic disorders in other settings, there are other populations that are similar to those of psychotic disorders which may provide insight and shape research on the hospital outcomes of patients with psychotic disorders. People with serious mental illness (SMI) have a disability because of mental health conditions and experience poor hospital outcomes compared to the general population. In a review of 22 studies examining the quality and outcomes of their hospital care, McGinty, Baller, Azrin, Juliano-Bult, and Daumit (2015) found that individuals with SMI overall, especially those who were Medicaid beneficiaries, received worse care compared to other patients or compared to best-practice guidelines. For example, these patients are less likely to receive standard-of-care surgeries such as post-myocardial infarction (MI) revascularization than patients without a diagnosis of serious mental illness even when matched for age and comorbidities (Copeland et al., 2015; Druss, Bradford, Rosenheck, Radford, & Krumholz, 2000; Li et al., 2011). They are also less

likely to receive standard-of-care assessments than other patients, such as low rates of left-ventricular ejection fraction evaluation during heart failure (Blecker et al., 2010). Because there is some overlap between patients with SMI and those with psychotic disorders, the deficits in care processes they receive may also exist for patients with psychotic disorders and may drive some of the disparities in hospital outcomes they experience.

Like patients with psychotic disorders, those with SMI have high rates of adverse events during non-psychiatric hospitalizations, with one study finding an average of 5.8 adverse events every hospitalization of patients with SMI (Daumit et al., 2016). In a small study of patients with SMI on Medicare ($N=253$), McGinty et al. (2017) found adverse events for patients with SMI were common and associated with patient and process factors, such as mental status and providers failure to follow hospital policies and procedures. Though the sample was limited to Medicare enrollees who died in a single state, the direct link between patient and process level factors such as these may also be contributing to the hospital outcomes of patients with psychotic disorders.

Finally, qualitative research shows that nurses and doctors have difficulty caring for patients with SMI in the non-psychiatric hospital setting, finding it time consuming and something for which they feel ill-prepared (Giandinoto & Edward, 2014, 2015; Zolnieriek & Clingerman, 2012). Whether due to lack of support from the hospital, deficits in education or some other factor, providers feel that they cannot provide the best possible care for these patients, which is likely to contribute poor outcomes.

This research indicates that differences, both within-group and in comparison to the general population, may contribute to the poor outcomes experience by patients with

psychotic disorders in the non-psychiatric hospital setting. They also demonstrate that hospital and health outcomes are complex and involve patient, process and system level characteristics, each of which must be considered when trying to understand disparities. The poor hospital outcomes experienced by patients with psychotic disorders are a complex phenomenon that must be considered from multiple perspectives and at multiple levels to fully understand and, eventually, intervene successfully.

Key Definitions, Theoretical Framework and Approach

As defined by the National Institute of Mental Health, psychoses are “conditions that affect the mind, where there has been some loss of contact with reality....a person’s thoughts and perceptions are disturbed and the individual may have difficulty understanding what is real and what is not” (National Institute of Mental Health, 2018). A variety of conditions, both psychological and medical, may cause a person to experience psychosis. The most well-known of these are psychiatric conditions such as schizophrenia but there are neurological conditions such as Parkinson’s and Alzheimer’s that may cause psychosis in an individual. This dissertation explores the experiences and hospitalizations of people who have psychosis due to a psychiatric condition. Psychiatric diagnoses generally have an unknown medical, psychological or social etiology and are associated with primarily behavioral and cognitive symptoms. While some aspects of their experiences may overlap with those who have psychosis due to detectable neurological conditions, care for individuals with psychotic disorders related to a psychiatric diagnosis is generally managed through the mental health system, a distinct category of the healthcare system that focuses on behavioral and psychiatric health. Structural damage to the brain and impaired sensory integration from neurological conditions may hallucinations and confusion similar to psychiatric psychosis, but the

mechanisms of these disorders are relatively well understood and managed through non-psychiatric providers such as neurologist and gerontologists

In addition to the system and diagnostic differences between those with psychotic disorders and those who experience psychosis from medical conditions or substances, there is also significant amount of stigma towards individuals with psychiatric disorders in general and psychotic disorders in particular (González-Torres, Oraa, Arístegui, Fernández-Rivas, & Guimon, 2007). They are often treated differently than others who may experience psychosis due to the stigma that they experience from the general public and healthcare providers. Thus, for this study, the term **psychotic disorders** is used to describe the DSM-5 diagnosis of a Schizophrenia Spectrum Disorder or a Mood Disorder with Psychotic features or an ICD-10 code for the same or equivalent psychiatric disorder, excluding psychosis caused by medicines, substances or medical conditions. See Table 1.1 for a full-listing of DSM-5 psychotic disorder diagnoses used in this study, short descriptions and equivalent ICD-9 and ICD-10 codes.

Hospitalization is an event where an individual is admitted to a hospital for treatment, symptom management or diagnostic purposes. Specifically, for the purposes of this dissertation, the term is used when the individual was admitted to the hospital with the intention of staying for at least one overnight period. This excludes outpatient surgical and diagnostic procedures that may take place in the hospital setting but do not involve admission. Non-psychiatric hospitalizations, which this dissertation focuses upon, are those hospitalizations for which the individual is not admitted by or to the primary care of psychiatric care providers. Though these providers may be involved in care due to psychiatric consults, non-psychiatric providers are the primary decision makers for

patient care during these hospitalizations, including treatment course and discharge.

Though med-psych units do exist, in which an individual with a high level of psychiatric need is admitted for medical care, these units are rare, primarily for non-psychiatric treatment of patients and none were located in the hospital system used as a source of data for this study.

A **health equity** approach is used throughout this dissertation and informed the development of research questions, methodologies and interpretation of results. Health inequities are the “systematic, plausibly avoidable health differences according to race/ethnicity,...socioeconomic resources or position,...gender,...age, geography, disability, illness,...or other characteristics associated with discrimination or marginalization” (Braveman et al., 2011). These inequities occur because of the differences in social opportunity, access to medical services, education, etc. which heavily influence individuals. Social forces shape and define individual behaviors, access to resources and the overall structures of social and health systems. A health equity approach encourages multi-level and intersectional understandings of differences in health outcomes and posits that true change must involve an understanding of these different levels and their interactions.

People with psychotic disorders experience significant stigma and social marginalization (Noblett, Lawrence, & Smith, 2015; Patten et al., 2016; Schulze & Angermeyer, 2003), even from healthcare providers (Mestdagh & Hansen, 2014; Serafini et al., 2011). Stigma here is understood to be a societal force, demonstrated by but not contained solely within interactions between individuals. Stigma then causes differences in direct care processes, access to care and systems of care that contribute to poor health

outcomes. Because of this, stigma has been identified as one of the fundamental causes of health inequity (Hatzenbuehler, Phelan, & Link, 2013). When considering the high levels of stigma experienced by patients with psychotic disorders and the complex social, economic and policy factors that shape hospital outcomes, a health equity approach is necessary for this work as it acknowledges and integrates the multi-level and multi-factorial nature of health outcomes and how they often intersect with systems of marginalization and disadvantage.

In addition to the health equity approach that is fundamental to this research, the **Quality Health Outcomes Model** (QHOM; Mitchell, Ferketich, & Jennings, 1998) was chosen as the conceptual model for organizing and explaining the relationships between factors that may affect hospital outcomes of individuals with psychotic disorders. The QHOM was originally developed to facilitate both clinical understanding and research related to the quality of life effects of health service quality on patient outcomes. It posits that there are four important domains that must be considered when thinking about health systems and interventions: Interventions, Patient Characteristics, Systems and Outcomes. Though originally investigating only specific interventions, such as a diabetes education program (1998), the QHOM has since been used to frame complex health services questions that involve the intersection of large numbers of the complex processes of care, medications and procedures that are part of our healthcare system.

The four domains of the QHOM each pertain to factors that may be involved in a healthcare encounter or a patient's outcome. **Patient characteristics** are demographic and medical factors, such as gender, race/ethnicity, diagnoses, illness severity and insurance status. **System** variables are factors associated with the hospital or healthcare

system overall, such as the hospital patients are treated in, nurse staffing levels, and the technology available for care. **Outcomes** are measures that can be used to understand the success, or failure, of other aspects of the QHOM. These can be patient-focused, such as functional status or patient satisfaction score, but are often events like extended length-of-stay, adverse events and rehospitalization that are important to both patients and the healthcare setting. The final factor, known as Interventions in the original QHOM model, is here referred to as **Processes**, as this captures more broadly what is done by providers, such as education, assessment or even the lack of appropriate care.

Unlike strictly linear systems used in healthcare research like the Donabedian Model (Donabedian, 2002), the QHOM proposes that the relationships between these categories and the variables within them are dynamic. Interventions and other health processes cannot directly affect outcomes; they must be assessed as they interact with systems and individual patient characteristics. The QHOM has been used extensively to frame interventions (Gilmartin & Sousa, 2016), quality research (Lucero, Lake, & Aiken, 2010), care guidelines (Mayberry & Gennaro, 2001) and hospital outcomes research (Ma, McHugh, & Aiken, 2015) so is an appropriate framework for exploring factors related to non-psychiatric hospital outcomes for patients with psychotic disorders. The domains of the QHOM influence each other, and it is expected that they will interrelate rather than having simple and linear relationships. See Figure 1.1 for the Quality Health Outcomes Model and Table 1.2 for definitions of each domain of the QHOM used for this study.

Summary, Study Purpose and Specific Aims

Altogether, the literature demonstrates that: a) patients with psychotic disorders have longer hospital length-of-stay than other patients, as well as other poor hospital outcomes, such as more adverse events and readmissions, b) deficits in hospital care are

also experienced in similar populations with resultant poor hospital outcomes, and c) patients with psychotic disorders are subject to deficits in care and poor outcomes in multiple healthcare settings. Though there has been little research on factors related to hospital outcomes for patients with psychotic disorders, the research on care processes for these patients in other settings and that of a related population, patients with SMI, guide the current inquiry. While the literature that describes the hospital outcome disparities experienced by individuals with psychotic disorders is robust, there are clear gaps in our understanding of why these disparities exist. This knowledge is critical to inform interventions and policies that will improve hospital outcomes and reduce disparities for patients with psychotic disorders. Thus, the purpose of this study is to better understand the hospitalizations of patients with psychotic disorders and identify factors associated with poor hospital outcomes for these patients so that future interventions and research can more accurately address the specific needs of this vulnerable population.

The specific aims of this dissertation are to:

1. Explore the experience of patients with psychotic disorders hospitalized on medical-surgical units
2. Examine patient characteristics and care processes associated with length-of-stay (primary outcome), adverse events and readmissions (secondary outcomes), among patients with psychotic disorders during non-psychiatric hospitalizations.

H1: Discharge to a psychiatric setting will be associated with increased length-of-stay.

H2: Use of intramuscular chemical sedation or physical restraints will be associated with a longer length-of-stay

H3: Diagnosis of schizophrenia will be associated with longer length-of-stay

3. Integrate qualitative and quantitative data to contextualize factors associated with length-of-stay, adverse events and readmissions among patients with psychotic disorders during non-psychiatric hospitalizations

These aims will be accomplished through an integrative review of literature around adverse events experienced by patients with psychotic disorders in non-psychiatric settings (Chapter 2) and a mixed method, exploratory sequential study non-psychiatric hospitalizations for patients with psychotic disorders (Chapter 3 & 4).

Study Overview

To accomplish study aims, this dissertation employed an exploratory sequential mixed methods design. Mixed methods research is a distinct methodology that brings rigorous quantitative and qualitative data collection together to answer complex questions that may be difficult to understand with only one of these approaches (Creswell & Plano Clark, 2018). Critical to mixed methods research is the integration of study design and results using logically consistent, organized frameworks and conceptualizations, to successfully bring together qualitative and quantitative methods (2018). An exploratory sequential mixed methods study (qual->QUANT) begins with qualitative data collection (e.g. interviews, ethnography, focus groups) then uses this data to inform a quantitative data collection and analysis (e.g. informing chosen measures, items on surveys, instrument design and validation; 2018). Phase 1 of this study consisted of semi-structured qualitative interviews of patients with psychotic disorders. Phase 2 used data

from these interviews to inform a quantitative analysis of factors at the process- and patient-level associated with length-of-stay, as well as to contextualize the results.

Figure 1.2 is a Mixed Methods Study diagram which shows the data collection, processes and outputs of this dissertation, demonstrating how each of the three papers fit together. Figure 1.3 specifically lays out the mixed methods stages, processes and outcomes for each stage of the study. Independent variables for the quantitative analysis were drawn from the Penn Data Store, informed by the data from qualitative interviews; this process is discussed more in-depth in Chapter 4. Dependent variables, defined and operationalized in Table 1.3, were based on relevant literature around hospital care quality.

For Phase 1, twenty patients from medical-surgical units at a hospital in the University of Pennsylvania Health System (UPHS) with a diagnosis of psychotic disorders were recruited. These patients were interviewed about their experiences in the hospital and interactions with providers. After transcription, these interviews, related case notes and setting notes were coded using a deductive-inductive approach to thematic analysis (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). This approach to qualitative analysis seeks to find patterns in the data that coalesce into distinct themes (Braun, Clarke, & Terry, 2014b). It uses a lower level of inference than more philosophical analytic approaches while also recognizing that interpretation and the role of the researcher is necessary to obtain meaning from data. Information gathered from these interviews, along with clinical expertise and reviews of the literature, guided the selection of variables for analysis in the quantitative arm of the study. During final integration,

themes and codes were brought together with the quantitative model and used to contextualize each other.

Phase 2 consisted of a quantitative analysis of hospital outcomes for patients with psychotic disorders during non-psychiatric hospitalizations. All data for the quantitative analyses derived from patients at one of the three Philadelphia hospitals in UPHS: PPMC, Hospital of the University of Pennsylvania and Pennsylvania Hospital. The quantitative portion of the study examined the outcomes of length-of-stay (primary), adverse events and 30-day readmissions (secondary) for patients with psychotic disorders who have been hospitalized for non-psychiatric reasons. All data for these analyses were obtained from the Clinical Data Warehouse of the Penn Data Store, a clinical data warehouse of patient information developed and used by UPHS. The Penn Data Store's system integrates administrative, clinical and billing data from all outpatient appointments, inpatient hospitalizations and lab tests performed in the UPHS into a format that facilitates both quality improvement and clinical research projects.

Non-psychiatric index hospitalizations of patients with psychotic disorders from the three hospitals were used to construct models of chosen hospital outcomes. Using independent variables chosen based primarily on the qualitative data, a general linear model (GLM) was constructed to identify factors associated with extended length-of-stay at the patient characteristic and process levels. Secondary analyses were conducted via logistic regression modeling for adverse events and readmission. Though the primary aim was to understand how process and patient characteristics contribute to the three hospital outcomes, there may be relationships between the three outcomes as well. A final analysis will be conducted to examine the interactive effects of these three outcomes.

Where appropriate, the reporting and interpretation of these quantitative analyses was linked to quotes or themes from qualitative interviews, case notes or setting notes.

Integration is necessary for all mixed methods research and the proposed study was integrated at the design, methods and reporting levels (Fetters, Curry, & Creswell, 2013). Design-level integration was through the decision to use an exploratory sequential mixed methods approach. The method-level integration, which occurs at data collection and analysis, was primarily through “building”, where one form of data informs the collection of the other. In this case, codes from patient interviews informed data collection by informing variable selection for the quantitative analysis of electronic medical records. Finally, this study is both contiguous (i.e., qualitative and quantitative data reported separately) and weaving (qualitative and quantitative data on specific themes presented together), two types of mixed methods data reporting (Creswell & Plano Clark, 2018; Fetters et al., 2013). The final integration consists of a discussion of results of the qualitative and quantitative analyses, focused on creating a more robust understanding of the hospitalizations of patients with psychotic disorders.

Innovation

This study is innovative in multiple ways. Qualitative interviews were conducted with patients with psychotic disorders currently hospitalized on medical-surgical units. Though a previous qualitative study was conducted on patients with a history of serious mental illness and their experiences during non-psychiatric hospitalizations, only one of these patients had a psychotic disorder and months had passed between the hospitalization and interviews (Zolnierek, 2013b). In this dissertation, patients were interviewed during their hospitalization, when their experiences were still fresh and

information about small details of the hospitalization and interactions with hospital staff were more likely to be remembered and expressed to the researchers. No other study to the author's knowledge has interviewed this population of patients about their experiences in a non-psychiatric hospital setting while they were currently hospitalized, capturing their experiences as they were happening.

Though exploratory sequential mixed methods studies are not uncommon, there are few studies that have integrated qualitative interviews of patient experiences with the data from clinical data warehouses. It is the study author's belief that patient experiences collected through qualitative approaches can serve to both inform and contextualize these quantitative analyses, allowing even greater insight into the relationship between processes, systems, patient characteristics and poor hospital outcomes. Hearing the lived experiences of patients may help to facilitate the translation of this knowledge from research to clinical practice. The stories of real people and their interactions with healthcare providers can be integrated into recommendations, as well as facilitate the identification of risk factors. Long-term, the dissertation will launch the author's career as an independent nurse-scientist investigating multi-level factors associated with health disparities for people with mental illness and addresses them with nurse-centric care and interventions.

Finally, to the author's knowledge, the article in Chapter 4 will be the first study that examines length-of-stay in non-psychiatric settings specifically for patients with psychotic disorders. While there have been other studies on patients with psychotic disorders and their hospital outcomes, length-of-stay has been an incidental outcome in most. As this patient population has a persistently longer length-of-stay during non-

psychiatric hospitalizations, it is critically important that we understand what factors are associated with longer length-of-stay for them and, if possible, which patients are at highest risk of long hospital stays.

Human Subjects Consideration

People with psychotic disorders are often excluded from research, sometimes for methodologically sound reasons and sometimes not. Often, they are simply assumed to be incapable of consenting to research participation or unable to participate effectively in research protocols (Wilson & Stanley, 2006). A significant body of research has demonstrated that many individuals with psychotic disorders have capacity to consent to research participation (Carpenter et al., 2000; Dunn, 2006; Jeste et al., 2007). With the careful use of capacity consent assessment tools and proper education materials (Gupta & Kharawala, 2012; Jeste et al., 2008), participants with psychotic disorders can participate fully in research and also experience the benefits as their unique health needs and response to treatments will be better understood. Though a common practice, excluding people with a psychiatric diagnosis is ineffective as a method to protect those who have impaired capacity to consent (Howe et al., 2005). Moreover, “the inappropriate exclusion of individuals who are able to consent competently is an affront to their dignity, autonomy, and right of self-determination” (pg. 42, Dunn, 2006). Vulnerable populations like individuals with psychotic disorders should be protected as they engage in research, but blanket exclusion harms these individuals in the long run and is itself an unethical practice. Thus, a standardized capacity assessment should be used with this population, though this practice is not always used in current research practices (Weissinger & Ulrich, In Review).

For Phase 1's qualitative data collection, each participant was screened for capacity to consent to participation in research by the author, who is clinically trained in the administration of structured psychological assessments. The UCSD Brief Assessment of Capacity to Consent (UBACC), a tool developed to determine capacity to consent for patients with schizophrenia (Jeste et al., 2007) was used as a standardized assessment and potential participants scoring below a previously established threshold were excluded from participation. Besides screening for capacity, additional steps were taken to protect patients' privacy and to protect their data as they are in a vulnerable space, being currently hospitalized and discussing this hospitalization. A full description of human subject protections for the qualitative data collection will be found in Chapter 3.

Though Phase 2 of this mixed methods study was a secondary data analysis, sensitive data were collected on a vulnerable population and so precautions were made to respect their privacy and keep data secure. All data requests were made to specifically not provide identifiable information (e.g. name, medical record number, birth date). The Penn Data Store generated pseudo-medical record numbers linked patient's information together without connection to actual medical records. All data obtained was kept in restricted-access servers hosted by the University of Pennsylvania School of Nursing. Further information about data management for Phase 2 can be found in Chapter 4.

Table 1.1

Psychotic Disorders

DSM-5 Disorder	ICD-9 & ICD-10 Codes	Description
Schizophrenia	ICD-9: 2950X, 2951X, 2952X, 2953X ICD-10: F20, F20.XX except F20.8, F20.81	Two or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative symptoms Symptoms cause functional loss and last at least 6 months
Schizophreniform Disorder	ICD-9: 2954X ICD-10: F20.8, F20.81,	Two or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative symptoms Symptoms cause functional loss and at least 1 month but not more than 6
Schizoaffective Disorder	ICD-9: 2957X ICD-10: F25, F25.XX	Meet criteria for Schizophrenia with concurrent Mood episode (Manic Episode or Major Depressive Episode)
Delusional Disorder	ICD-9: 2971 ICD-10:	Delusion that last more than one 1 month, no diagnosis of schizophrenia

	F22, F22.XX	
Brief Psychotic Disorder	ICD-9: 2988 ICD-10: F23, F23.XX	One or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative symptoms Symptoms cause functional loss and at least 1 day but not more than 1 month
Unspecified Schizophrenia Spectrum Disorder	ICD-9: 2956X, 2958X, 2959X ICD-10: F29, F29.XX, F20.89, F24, F24.XX	Significant functional impairment due to symptoms of one or more schizophrenia spectrum disorder without meeting full criteria
Bipolar Disorder with mood congruent/incongruent Psychotic Features	ICD-9: 29604, 29614, 29644, 29654, 29664 ICD-10: F30.2, F30.2X	At least one period of elevated, expansive or irritable mood with delusions or hallucinations during this manic episode
Major Depressive Disorder with mood congruent/incongruent Psychotic Features	ICD-9: 29624, 29634 ICD-10: F32.3, F23.3X, F33.3, F33.3X,	A period of sad, depressed or down mood with hallucinations or delusions during the depressive episode

Note. Descriptions adapted from APA (2013). X or XX indicates any valid integers from 1-9 which can result in a valid ICD-9 or ICD-10 code.

Table 1.2

Quality Health Outcomes Model Domain Definitions

Variable Name	Definition
Process	Called Interventions by Mitchell et al. (1998). “Clinical processes are direct and indirect interventions and related activities by which they are delivered” (pg. 44). Process factors include provider intervention, assessment and patient-education, as well as the lack of needed or recommended care processes.
System	Mitchell et al. (1998) states that the " the size, ownership, skill mix, client demographics, and technology would be among structural elements” (pg. 44) are the Systems of care. The definition has been further expanded to cover other broader system factors such as hospital policies (McGinty et al., 2017) and nurse staffing levels (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007).
Patient Characteristics	Discussed as Client Characteristics by Mitchell et al., (1998), these “differing states of client health, demographics, and disease risk factors” are necessary to consider as individuals do not enter health settings with the same risk for any particular outcome. Patient Characteristics is expanded here to include factors such as insurance status, housing and individual preferences.
Outcomes	In the model proposal, Mitchell et al (1998) describes outcomes as “results of care structures and processes that integrate functional, social, psychological, physical, and physiologic aspects of people’s experience in health and illness” (pg. 44). These include death, disability and disease status but also includes functional status and economic impact. For this dissertation, major outcomes of interest are hospital adverse events, readmissions and length-of-stay.

Table 1.3

Outcome Variables and Operationalization

Variable Name	Definition	Operationalization
Length-of-Stay	The time from being admitted to the hospital to discharge. Patient can be discharged to any location (inpatient psychiatric facility, home, rehabilitation facility, etc.).	Difference between the time of patient's admittance to hospital by provider and being discharged from hospital in days Variable Type: Continuous
Rehospitalization	When a patient is admitted to a hospital within a set-time period after their discharge from the hospital (usually 30-days). Can be all-cause or same cause, depending on purpose of analysis (Horwitz et al., 2011). For this study, 30-day rehospitalization was chosen for its use in hospital quality metrics and reimbursement (CMS, 2018)	Patient admitted for any non-psychiatric reason to a hospital in the UPHS system within thirty days of discharge from a non-psychiatric hospitalization. Readmission will be identified by comparing the dates of all hospitalizations for each patient and identifying admissions that occur within 30-days of a previous discharge. Variable Type: Dichotomous
Adverse Event	"Unintended physical injury resulting from or contributed to by medical care (including the absence of indicated medical treatment), that requires additional monitoring, treatment, or hospitalization, or that results in death." (McCannon, Hackbarth, & Griffin, 2007). These	The presence of adverse events will be measured using the Patient Safety Indicators developed by the AHRQ (McDonald et al., 2002). These indicators flag patients based on discharge diagnoses that indicate an adverse event occurred during this

	include events like medication errors, development of pressure ulcers, patient falls and surgical error.	hospitalization. The presence of a Patient Safety Indicator or a Never Event in discharge diagnoses (wrong-site-surgery, patient suicide) will be considered indicative of an adverse event. Variable Type: Dichotomous
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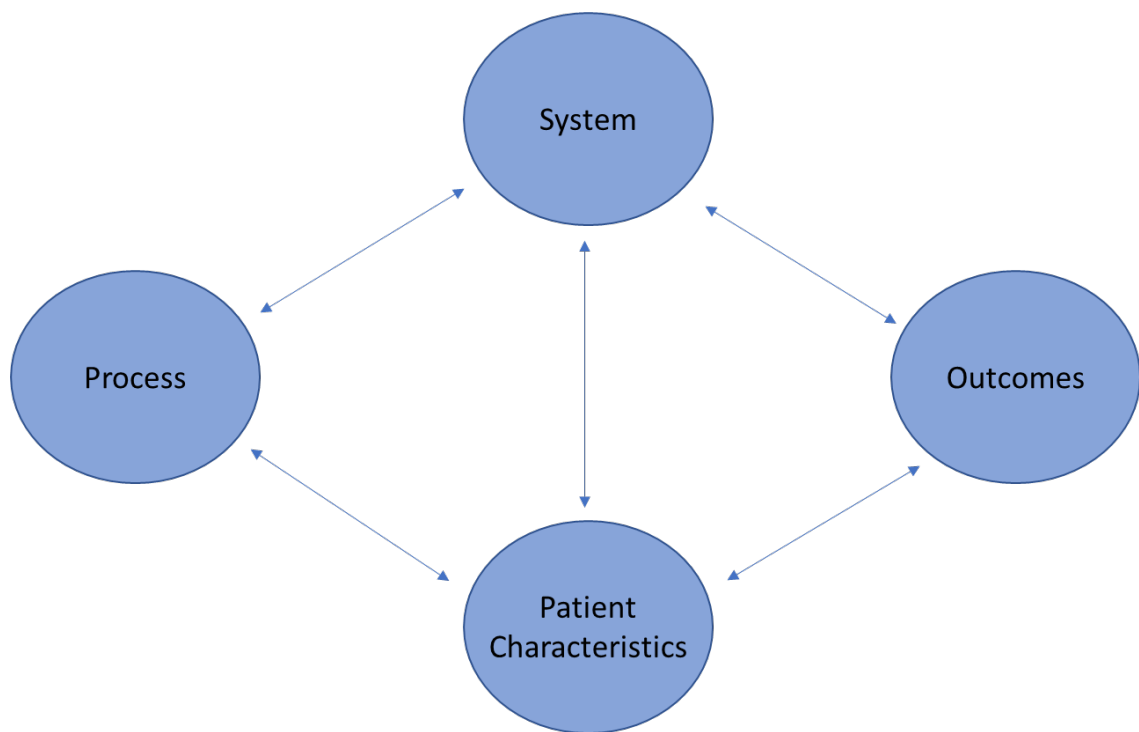


Figure 1.1 Quality Health Outcome Model. Adapted from Mitchell et al. (1998).

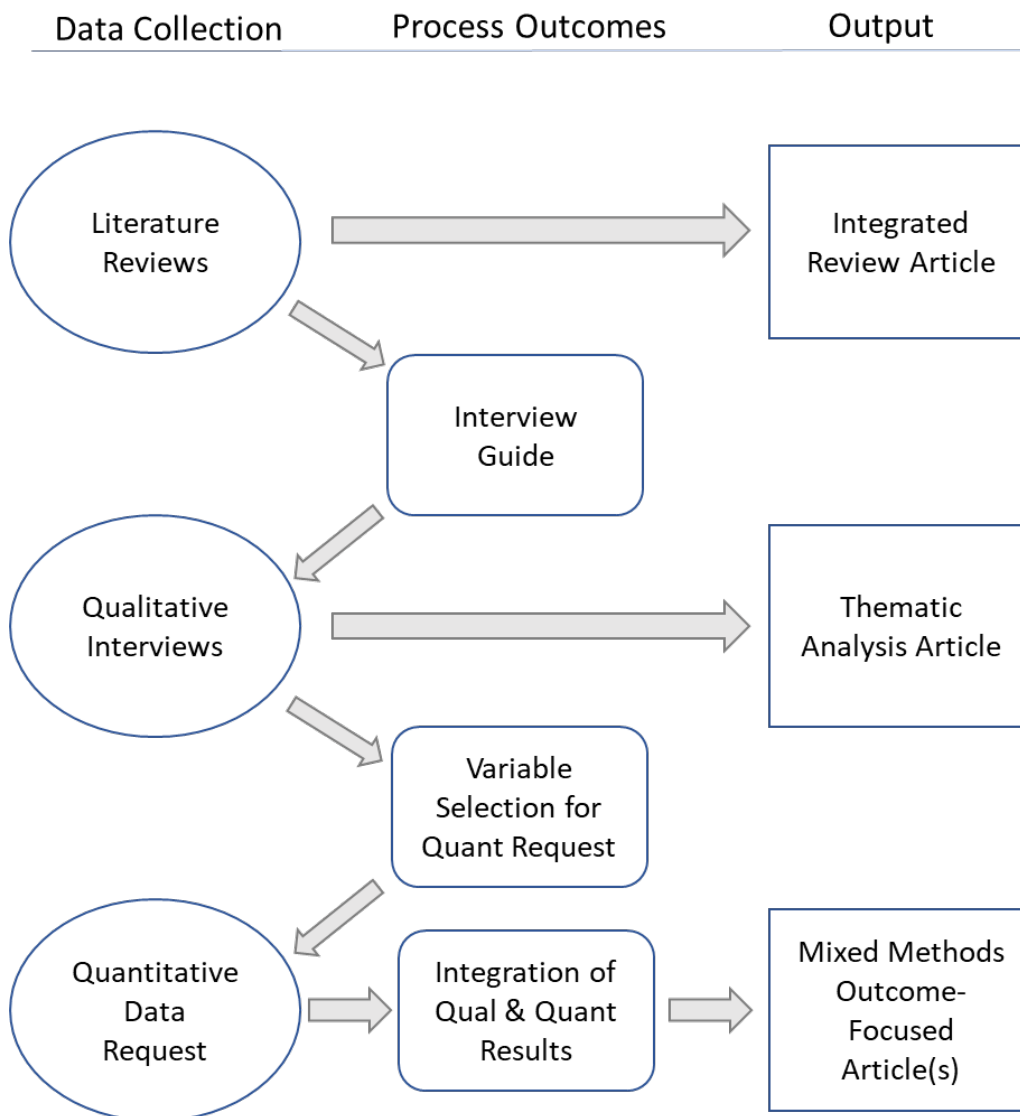


Figure 1.2 Mixed Methods Study Diagram.

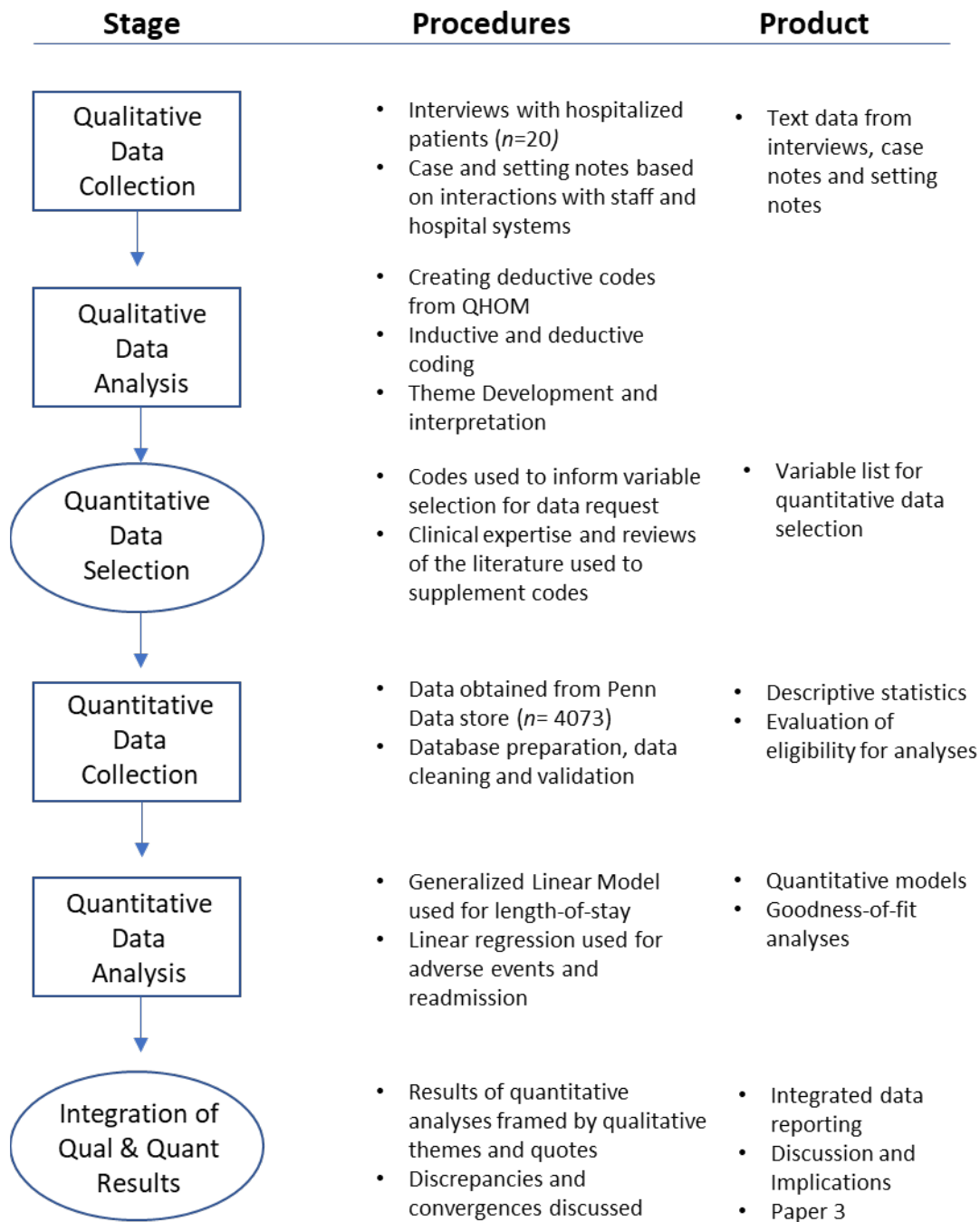


Figure 1.3 Mixed Methods Procedures and Products Diagram

CHAPTER 2:
ADVERSE EVENTS DURING NON-PSYCHIATRIC HOSPITALIZATION FOR
PATIENTS WITH PSYCHOTIC DISORDERS: AN INTEGRATIVE REVIEW

Abstract

People with psychotic disorders experience high rates of many medical conditions, which lead to increased rates of medical or surgical hospitalization compared to the general population. During these hospitalizations, they experience poor outcomes, including elevated risk of adverse events but what factors contribute to this disparity remain unknown. An integrative review was conducted on hospitalizations in non-psychiatric settings for patients with psychotic disorders with the goal of understanding this disparity and identifying potential contributing factors. Electronic databases (CINAHL, PubMed, Google Scholar) were systematically searched and relevant literature identified. Twenty-three articles were identified as eligible. The Quality Health Outcomes Model (QHOM) was used to organize findings into Patient Characteristics, System Factors, Processes of Care and Outcomes. Overall, patients with psychotic disorders appeared to have more medical comorbidities, present to the hospital later in their illness, be treated at smaller hospitals and experience poor assessment from providers. None of these factors, however, were examined in relation to the high rate of adverse events they experienced. Further research is necessary to understand how these differences may influence adverse event rates during non-psychiatric hospitalizations for these patients.

Introduction

Psychotic disorders are a group of related mental health disorders characterized by hallucinations, delusions and/or disordered thought processes not congruent with the reality of others around them and cultural norms (APA, 2013). In addition to a high psychiatric symptom burden and social marginalization (Evensen et al., 2015; Foster, Gable, & Buckley, 2012; González-Torres et al., 2007; Perkins & Rinaldi, 2002), people with psychotic disorders also have high rates of a wide variety of acute and chronic medical conditions, including heart disease, diabetes, kidney disease, pulmonary problems and infectious diseases (Carney, Jones, & Woolson, 2006; De Hert et al., 2011; Weber, Cowan, Millikan, & Niebuhr, 2009). These medical comorbidities, when taken with a lack of quality primary care (Crawford et al., 2014) and a high use of emergency services (Hakenewerth, Tintinalli, Waller, & Ising, 2015), contributes to the high prevalence and elevated cost of non-psychiatric hospitalization experienced by these individuals (Cahoon et al., 2013; Davydow et al., 2016; Lin, Huang, Chen, & Chen, 2011; McGinty & Sridhara, 2014). Despite being only approximately 1.2% of the population (Messias et al., 2007), those with psychotic disorders have been found to account for more than 3% of all non-psychiatric hospitalizations (Copeland et al., 2007) and account for a disproportionate percentage of public insurance spending (McDonald, Hertz, Lustik, & Unger, 2005).

Once hospitalized, patients with psychotic disorders continue to experience disparities in their health outcomes. Compared to other patients, they have longer length-of-stay, often days longer than comparison patients (Bressi, Marcus, & Solomon, 2006; Copeland et al., 2008), their hospitalizations are more expensive (Sayers et al., 2007) and they are at higher risk for inpatient mortality (Copeland et al., 2014). While medical

comorbidities may drive some of these poor hospital outcomes, even studies with matched control groups find that hospital outcomes remain worse for patients with psychotic disorders (Chen, Lin, & Lin, 2011).

Adverse events may be one of the important factors for understanding the differences in overall hospital outcomes experienced by patients with psychotic disorders. These are “an event...that caused harm to a patient as a result of medical care. This includes never events; hospital-acquired conditions; events that required life-sustaining intervention; and events that caused prolonged hospital stays, permanent harm, or death” (DHHS, 2017; Table 1). Medication errors are one of the most common adverse events during hospitalization (Van Den Bos et al., 2011) but adverse events are a broad category encompassing many type of events. Adverse events during non-psychiatric hospitalizations are of particular importance when examining hospital outcomes, as they are relatively common, with up to 9% of hospital visits having an adverse event (de Vries et al., 2008). Every adverse event causes harm to the patient, from increasing patient’s pain and suffering to increasing hospital length-of-stay or even causing death or disability. Approximately 7.5% of adverse events contribute to a patient’s death while an additional 14% are associated with permanent disability or chronic pain (de Vries et al., 2008). Besides their impact on individual health, adverse events are also associated with a significant economic impact on the individual as well as the institution (Classen, Pestotnik, Evans, Lloyd, & Burke, 1997; Hoogervorst-Schilp et al., 2015).

Despite their impact and frequency, many adverse events are considered preventable (de Vries et al., 2008). Therefore, they are important to consider when trying to understand the hospital outcomes of a vulnerable population, like patients with

psychotic disorders. Individuals with serious mental illness have increased rates of adverse compared to the general population (Copeland et al., 2008; McGinty et al., 2015; Reeves, Henshall, Hutchinson, & Jackson, 2018) but these reviews were not specifically focused on patients with psychotic disorders and included patients with depression, bipolar disorder and other psychiatric diagnoses. To the authors' knowledge, there has been no review of literature focused specifically on adverse events for people with psychotic disorders during non-psychiatric hospitalizations.

A modified version of the Quality Health Outcomes Model (QHOM; (Mitchell et al., 1998) was used to organize this integrative review. The QHOM models the complex relationships between healthcare processes, patient characteristics and systems of care with specific or general health outcomes (See Figure 2.1). It divides information into four interrelated domains that will be called Process, Patient Characteristics, System and Outcomes. Process is the “clinical processes, direct and indirect interventions and related activities by which they are delivered” (pg. 44) that an individual patient experiences, sometimes known as interventions. System represents factors “such as a hospital or provider network, then the size, ownership, skill-mix...and technology” (pg. 44) that are not particular to an individual patient but the systems in which they experience care. Patient Characteristics are those “differing states of client health, demographics, and disease risk factors” (pg. 44) as well as individual behaviors, decisions and preferences that may or may not have a direct effect on patient outcomes. Finally, Outcomes are defined as measurable changes or events that occur in the context of system variables to individual patients.

The purpose of this integrative review was to explore the literature around adverse events during non-psychiatric hospitalizations for patients with psychotic disorders. The findings were organized by the QHOM to facilitate understanding, identify deficits in our understanding and create plausible suggestions for clinical providers to address the very real needs of this population. Only by understanding the multi-level factors that affect adverse events for patients with psychotic disorders can the disparities experienced by these patients be properly addressed.

Methods

This paper uses the integrative review methodology outlined by Whitemore and Knafl (2005) which blends a systematic and reportable search methodology with a flexible framework for integration of data across scientific methodologies and disciplines. Integrative reviews, more so than other methods of reviewing scientific papers, encourage integration of multiple types of evidence and perspectives to inform research and clinical practice (2005). While not all results may have clinical significance, the focus is on synthesizing literature in a manner that facilitates change at the patient, process or system level.

Searches were conducted on PubMed, CINAHL and Google Scholar (See Table 2.1 for search terms). For PubMed and CINAHL, results were combined and screened for preliminary inclusion. For Google Scholar, only the first ten pages of each search were screened, due to the algorithm for this search engine providing more results per search term used. The first author read articles identified and excluded based on the following criteria: 1) the population of interest was not patients with psychotic disorders or healthcare providers who worked with patients with psychotic disorders, or, there were

no sub-analyses that solely included patients with psychotic disorders, 2) the article was not linked in intent, theory or outcome with hospitalization adverse events, 4) involved only obstetric, psychiatric or outpatient settings, 5) was not published in English, 6) was not published between January 1st, 2002 and July 1st 2018, or 7) was a review of the literature. Psychiatric and obstetric settings were excluded due to the different nature of adverse events during obstetric and psychiatric hospitalizations. After reviewing all articles, the authors used the QHOM to organize findings, placing the findings of each article within and synthesizing around the four domains to identify potentially relevant patient, process and system level factors.

Findings

See the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram (Figure 2.2) for a breakdown of search results and the process of identifying relevant articles. In total, 23 articles met all criteria and related to the research question at hand. Out of these 23 articles, 22 were quantitative and one was a thematic analysis of psychiatric consultation. Two articles focused on healthcare providers while the rest were solely patient focused.

While all the papers examined factors relevant to patients with psychotic disorders during non-psychiatric hospitalizations, the studies covered a wide variety of populations. Two of the articles focused on providers working with individuals with psychotic disorders during non-psychiatric hospitalizations—one on medical-surgical nurses and the other consult psychiatrists. Of the patient focused articles, ten of the samples were drawn from the National Inpatient Survey, the National Hospital Discharge Database, Medicare databases or state records. Two used data from the Taiwanese

national medical system, five from Japanese hospitals and four studies from the United States Veterans Affairs hospital system. The majority of the studies were focused on surgical hospitalizations, with 9 examining orthopedic surgeries, seven examining non-orthopedic surgeries, three any non-psychiatric hospitalization, one hospitalization for pneumonia and one surgery for patients with breast cancer.

During the process of article review, multiple articles were found to pertain to more than one domain of the QHOM (Table 2.2). Seven articles addressed processes of healthcare delivery. Thirteen examined patient characteristics of patients with psychotic disorders in a non-psychiatric setting. Five had analyses that contained system-level factors. Outcomes were the most common, with sixteen of the twenty-three articles reporting adverse event outcomes such as prevalence or risk.

Process

Any hospitalization involves a multitude of processes delivered by a wide variety of healthcare providers, each of whom may contribute to the positive and negative outcomes the patient will experience. The processes discussed in this literature largely fell in two groups (see Table 2.3): medication delivery's relationship to postsurgical confusion and differences in direct care and assessment.

Post-surgical confusion, a type of time-limited delirium characterized by fluctuations in cognitive and psychological functioning often with accompanying agitation (Schenning & Deiner, 2015), has been linked to adverse events and was found in this review to be of special concern for patients with psychotic disorders. Comparing epidural vs. non-epidural analgesia, Kudoh et al. (2003) found no differences in effective pain management or a hypothesized reduction in post-surgical confusion. Kudoh and

colleagues (2002) found that patients receiving ketamine & propofol experienced lower rates of post-operative confusion than other patients. Finally, discontinuing antipsychotic medication before low-risk surgeries, a common practice, increased rates of post-surgical confusion compared to continuing medication to the day of surgery (Kudoh, Katagai, Takase, & Takazawa, 2004). The schedule and type of medication, though not route, were associated with post-surgical confusion, and theorized to be associated with adverse events, for these patients with psychotic disorders.

Patients with psychotic disorders were also found to have critical deficits in their hospital care compared to other patients. Copeland et al. (2015) found that veterans with schizophrenia were 61% less likely to receive surgery than other patients, even when controlling for diagnoses and risk factors. Chen et al. (2011) showed that patients with schizophrenia and pneumonia were less likely to be treated by relevant specialists. Nurses given vignettes of patients with psychotic disorders were less likely to recognize patients symptoms as being those of a myocardial infarction (McDonald et al., 2003). Finally, Freudenreich and Stern (2003) found that providers in the medical-surgical settings have difficulty providing care to patients with psychotic disorders, struggling with medication and behavioral management. Thus, there are differences at multiple levels in the care received by patients with psychotic disorders during non-psychiatric hospitalizations.

System

Only five articles addressed system factors related to patients with psychotic disorders and adverse events (see Table 2.3). Three articles from the United States found patients with psychotic disorders were less likely to be treated in medical centers or teaching hospitals (Chen et al., 2011; Khaykin et al., 2010; Liao et al., 2013). One study,

using data only from Maryland, found patients with psychotic disorders were more likely to be hospitalized at a teaching hospital than patients without a psychotic disorder (Daumit et al., 2006). Further information is necessary to determine whether patients with psychotic disorders are more likely to go to specific hospitals and how this may affect adverse event outcomes. Nursing education was the only other system variable examined, as McDonald et al. (2003) found BSN-prepared nurses performed better in patient vignettes related to assessing physical symptoms of individuals with psychotic disorders. None of these factors were analytically linked to adverse events but they indicate that patients with psychotic disorders may receive worse care or care in less effective systems than other patients which may contribute to adverse events.

Patient Characteristics

Patients with psychotic disorders were found to differ from other hospitalized patients in multiple, critical ways in addition to their psychotic disorder diagnoses (See Table 2.4). Above all, patients with psychotic disorders had higher levels of general medical comorbidities than other patients (Bot et al., 2014; Buller et al., 2015; Chen et al., 2011; Menendez et al., 2014). When looking at which specific diagnoses were more common for these patients, different samples found different results. Multiple studies found elevated levels of pulmonary comorbidities (Daumit et al., 2006; Liao et al., 2013; Menendez et al., 2014; Menendez, Neuhaus, Bot, Vrahas, & Ring, 2013), while one did not (Bot et al., 2014). Similar results were found for cardiac and vascular comorbidities, as some articles found a significantly higher rate and others did not. Only history of myocardial infarction and individual cancer diagnoses were found to be significantly lower or non-significant in all studies that measured them. While people with psychotic

disorders have high rates of general comorbidities, the exact differences may differ based on populations studied or periods of data collection.

In addition to their higher rate of medical comorbidities, patients with psychotic disorders were different from the general patient population in other ways. Cooke et al. (2007) identified a subpopulation of patients with schizophrenia, those with high levels of psychotic symptoms, who presented very late to the hospital with appendicitis. This late presentation was thought to be associated with poor treatment outcomes and post-surgical adverse events and complications. Similarly, Farasatpour et al. (2013) found that almost half (48%) of the patients with schizophrenia and breast cancer had significantly delayed care after diagnosis and before presenting to the hospital, with a median delay of 214 days; one patient delayed treatment for almost 10 years. These delays may stem from a wide variety of factors, as patients with psychotic disorders were significantly less likely to have private insurance, and more likely to be uninsured, as well as to present to the emergency room or have unplanned procedures (Daumit et al., 2006; Khaykin et al., 2010). The course of hospitalization and the experience of moving through the healthcare system may be different for these patients in ways that contribute to adverse events.

Patients with psychotic disorders may also have differences at the physiological level. Kudoh, Takahira, Katagai, and Takazawa (2002) and (Kudoh et al., 2003) hypothesized that some of the differences between patients who experience postsurgical confusion and adverse events may be in the inflammation stress response. Inflammation, now understood to be an important component of psychiatric symptoms and mental health disorders (Kirkpatrick & Miller, 2013; Miller, Maletic, & Raison, 2009), was examined in a small number of studies. Kudoh, Takahira, et al. (2002) showed

perisurgical elevation of norepinephrine and cortisol, two biophysiological markers associated with stress and inflammation, for patients with schizophrenia. These patients had a higher likelihood of postsurgical confusion. Kudoh et al. (2003) found similar results for another inflammation marker, interleukin-6. While the physiological stress of surgery raised inflammation markers in all patients, only for patients with a psychotic disorder was a larger increase associated with development of postsurgical confusion. There may be physiological differences among a subset of patients with psychotic disorders that make them particularly susceptible to postsurgical confusion and adverse events.

Though not a focus of the article, Farasatpour et al. (2013) identified 20% of their sample of patients with psychotic disorder receiving surgery for breast cancer had a history of a physical assault on healthcare providers and 21% had a history of verbal abuse of providers. There was no information on the prevalence of these events in the comparison sample nor whether these were generally the same patients. While it is not known from the data presented whether these events took place during the surgical hospitalization of note in the study, it is possible that knowledge of a history of violent behaviors may have informed how providers interacted with and assessed the patient. Fear of the patient due to an observed or documented history of abusive behaviors may change the processes that patients with psychotic disorders receive from providers.

Outcomes

Sixteen of the articles reviewed focused on outcomes, encompassing both general and specific types of adverse events (see Table 2.5). The terminology around adverse events varied greatly in the literature reviewed. Authors used the terms “complications”, “medical complications”, “postsurgical complications”, “post-operative morbidity” and

“adverse events” but all used to discuss harm to patients during a non-psychiatric hospitalization. To facilitate understanding, these will all be referred to as adverse events.

In addition to a diverse vocabulary for adverse events, they were also measured in a variety of ways in the reviewed studies. Three studies used the Agency for Healthcare Research and Quality’s (AHRQ) Patient Safety Indicators, a statistical and methodological package that detects adverse events based on ICD-9 or 10 admission and discharge diagnoses (McDonald et al., 2002). One used the Complications Screening Program (Iezzoni et al., 1994), which uses discharge and procedure codes to identify adverse events in administrative data. Two of the studies used an in-depth chart review to identify hospitalization adverse events. Claims data was used in two studies, though only one based the criteria on previous research on identifying adverse events. Finally, eight articles used discharge diagnoses only, seven using ICD-9 or ICD-10 codes, and only one based the chosen discharge diagnoses or codes on previously existing literature or standards for detecting adverse events.

Despite the differences in measurement, there was a clear trend in the literature around the adverse events outcomes. In national, hospital system, and even single hospital studies, rates of adverse event were higher for people with psychotic disorders than the general population (see Table 2.5). The difference in the rate of adverse events for individuals with psychotic disorders and other patients varied between studies, ranging from only a few percentage points higher to over 150% higher, but the trend was clear and consistent. Outcomes reported in the literature fall largely into three categories: general postsurgical adverse events, specific postsurgical adverse events and non-surgical adverse events.

In the seven articles that discussed postsurgical adverse events as a single concept, all found an increased prevalence among patients with psychotic disorders, compared to the general population of hospitalized patients or matched controls. These articles found postsurgical adverse events in 14.7-55% of patients with psychotic disorders (Cooke et al., 2007; Farasatpour et al., 2013; Schwartz et al., 2018), with a 30%-128% higher risk of these postsurgical adverse events than found in patients without psychotic disorders (Bailey, Wirtalla, Sharoky, & Kelz, 2018; Gholson et al., 2018; Maeda, Babazono, Nishi, & Tamaki, 2014). No studies found a lower or the same rate of adverse events for individuals with psychotic disorders compared to controls.

Similar to comorbidities, when examining rates of specific postsurgical adverse events, prevalence and differences from control populations differed greatly. Multiple studies found increases in rates of postsurgical infections (Buller et al., 2015; Daumit et al., 2006; Klement et al., 2016; Liao et al., 2013), wound dehiscence (Smith et al., 2012), post-operative DVT (Daumit et al., 2006; Klement et al., 2016) and stroke (Klement et al., 2016; Liao et al., 2013) compared to control groups. Pulmonary issues post-surgically particularly common, with elevated risk of post-operative respiratory failure (OR=2.08, Daumit, et al, 2006), pneumonia (OR=2.29-2.99; Liao, et al, 2013; Daumit, et al, 2006) and pulmonary embolism (OR=1.23; Khaykin, et al, 2010). Notably, Gholson, et al (2018) found a 1400% higher risk of postsurgical pulmonary complications for patients with psychotic disorders. The only two specific adverse events that were found to be less common in these patients were peri-surgical lacerations and objects left in during surgery, which were only measured in two studies (Khaykin et al., 2010; Smith et al., 2012). It is unknown why these two would be less common, especially as the two studies

used different populations from which to draw their samples. Overall though, more adverse events were significantly higher for patients with psychotic disorders than controls.

For non-postsurgical adverse events, patients with psychotic disorders again had an elevated risk compared to other patients. Six articles reported on general medical adverse events and all of them found a higher rate or increased risk amongst patients with psychotic disorders compared to the general population (Bot et al., 2014; Buller et al., 2015; Chen et al., 2011; Gholson et al., 2018; Menendez et al., 2014; Menendez et al., 2013). As with the postsurgical adverse events, the rates of adverse events were different between the studies, but consistently higher than the control population, with increased risk of 56-120% for general adverse events (Buller et al., 2015; Gholson et al., 2018). For those studies that measured specific non-postsurgical adverse events, studies identified a 34-45% higher risk of pressure ulcer (Khaykin et al., 2010; Smith et al., 2012), 59-277% higher risk of sepsis (Daumit et al., 2006; Khaykin et al., 2010; Klement et al., 2016; Liao et al., 2013) and more unexpected increases in level of care such as blood transfusion and intubation (Buller et al., 2015; Gholson et al., 2018; Klement et al., 2016; Menendez et al., 2014).

Discussion

This work advances the science by providing a comprehensive review of the literature around adverse events for patients with psychotic disorders hospitalized in medical-surgical settings. The results indicate that patients with psychotic disorders may have individual differences as well as deficits in care processes and systems that contribute to the disparity in adverse event prevalence they experience. These results are

similar to reviews of patients with SMI (Copeland et al., 2008; Reeves et al., 2018) but addressing a much more specific population's needs.

At the patient level, patients with psychotic disorders generally have a higher disease burden than other patients and present later to the hospital. These may be exacerbated by the low rates of private insurance they experience and the difficulty they have obtaining and keeping effective outpatient primary and preventative care (Copeland et al., 2009; Hippisley-Cox et al., 2007; Nasrallah et al., 2006). Overall, patients with psychotic disorders are also sicker than other patients and may have had limited access to or use of primary and preventative care that other patients have. These deficits may contribute to the extended length-of-stay seen in some studies (Daumit et al., 2006), as comorbidities complicate hospitalization and exposes patients to more time in the hospital and may create a higher risk for adverse events.

Patients with psychotic disorders also experience different healthcare processes during their time in a medical-surgical setting. The decreased likelihood of seeing specialists and having surgery, as well as the misattribution of physical symptoms, indicate that their physical illnesses may not be taken as seriously or treated the same as other patients. These findings parallel literature on their experiences in outpatient and primary care settings (Roberts et al., 2006; Swildens, Termorshuizen, de Ridder, Smeets, & Engelhard, 2016). This may be partially related to the effects of the general stigma experienced by this population (Bjorkman, Angelman, & Jonsson, 2008; Corrigan et al., 2014). Other process differences may stem from the direct experiences of providers who have seen verbal and physical abuse from patients with psychotic disorders in the medical-surgical setting (Farasatpour et al., 2013). Some providers may simply not have

the skillset necessary to communicate effectively and provide care to patients with psychotic disorders (Freudenreich & Stern, 2003). Whatever the cause, difficulties in effective communication and fear from providers may contribute to poor assessment and missed care that both contribute to adverse event prevalence.

Processes of care, especially nursing care, must also be better understood address the needs of these patients. While it is clear that improving nurse education and staffing levels improves care for patients (Aiken et al., 2014), especially vulnerable patients (Carthon et al., 2012), it is unclear how organization or delivery of nursing care contribute to adverse events among patients with psychotic disorders. Further research is necessary to understand how differences in processes directly or indirectly affect hospitalizations and adverse events for patients with psychotic disorders.

Overall, the information in this review indicates that adverse events for patients with psychotic disorders during medical-surgical hospitalizations are common but does not directly connect any specific factors to their increased prevalence compared to other populations. No articles examined how different processes, patient characteristics or system factors contributed adverse event. Rather, most of the literature used the presence of a psychotic disorder diagnosis as the primary analysis, comparing individuals with and without them. Differences within the heterogeneous group of patients with psychotic disorders and between these individuals and other patients, were noted but not fully explored. The relationship of process, patient and system level factors on the rate or severity of adverse events were not evaluated statistically. Future research must move beyond the surveillance stage of disparities research and advance the understanding of

what factors are associated with and drive these poor hospital outcomes so that they can be successfully addressed.

Additionally, Though the QHOM is generally used for quality improvement practice and research, the papers in this review had underdeveloped analyses of how structural inequality may contribute to adverse events. For example, Black Americans are more likely to be diagnosed with psychotic disorders than their White counterparts (Olbert, Nagendra, & Buck, 2018; Schwartz, Docherty, Najolia, & Cohen, 2019) and are also more likely to experience hospital adverse events (Carthon et al., 2012; Coffey, Andrews, & Moy, 2005). However, analyses either adjusted for race, as seen in Daumit et al. (2006) or excluded the variable from their models entirely, as seen in Khaykin et al. (2010). No intersectional analyses were found in this review, and so the effect of important factors like race, ethnicity, SES and homelessness on adverse events remained unexplored.

Another important concept underrepresented in this review is stigma. A pervasive social force, stigma has profound effects on health, flowing through both individual behaviors and societal structures (Clair, Daniel, & Lamont, 2016). People who experience stigma around social class, race or disease status have trouble getting the best healthcare, experience negative interactions with providers and are often placed, both in a societal and a geographic sense, in situations that promote health inequity (Birbeck, Bond, Earnshaw, & El-Nasoor, 2019; Link & Hatzenbuehler, 2016). Many studies show high rates of stigma around people with psychotic disorders (González-Torres et al., 2007), even amongst healthcare providers (Alexander et al., 2016). Rather than decrease over time, overall stigma against people with psychotic disorders has increased in the

United States, especially the perception that they are dangerous (Parcesepe & Cabassa, 2013). Any effort to understand and address their healthcare needs must acknowledge both internalized and experienced stigma, including how systems of care may be shaped by stigma.

There are limitations that must be acknowledged for this integrative review. First, by including literature from Taiwan, Japan and Australia in addition to the United States, this review demonstrates that the problem of adverse events for patients with psychotic disorders is not solely in one healthcare system or nation. Conversely, the differences in these systems and populations may obscure important information that could be gained by solely considering a single healthcare system. Additionally, systems and processes were not causatively linked to adverse events in any of the literature; one cannot say which, if any, processes, systems or patient characteristics are predictive of or even substantially associated with adverse events. The use of the QHOM to frame this integrative review, while facilitating both the search and the integration, may have resulted in certain factors being omitted due to not fitting well into this simplified framework. Finally, most of the articles looked solely at those with schizophrenia and not other psychiatric disorders characterized by psychosis. Though these are smaller populations, patients with schizoaffective disorder or bipolar disorder with psychotic features may have specific outcomes or care needs that are missed by only examining patients with schizophrenia.

Conclusions

Patients with psychotic disorders have an increased risk of adverse events during non-psychiatric hospitalizations but this review indicates that the mechanisms of these disparities are still poorly understood. This review found patient-, process- and system-

level factors in the hospitalization of these patients that may contribute to these disparities. Unfortunately, clear linkages between these factors and adverse event outcomes were not investigated. Nevertheless, certain trends have been identified which can provide valuable and useful information for research and clinical practice for this population.

Patients with psychotic disorders generally present to the hospital with worse health than other patients, both with more medical comorbidities and possibly at a later stage of acute illness. The patients also were generally found to be less likely to receive specialty care and be hospitalized in large medical centers, indicating that their complex needs involving many comorbidities may not be fully met. Finally, the assessments and care they receive differ from that delivered to other patients, with nurses misunderstanding their needs and physicians being less likely to deliver standard-of-care assessment and interventions. Overall, these factors may increase adverse events through a variety of pathways, including increasing length-of-stay during hospitalization. As patients with psychotic disorders and those with other specific psychiatric diagnoses have been found to have longer length-of-stay in the hospital (Daumit et al., 2006; Bressi, Marcus & Solomon, 2006), this phenomenon and its relationship to patient, process and system factors such as those found in this review necessitate further inquiry.

A major critique of the literature that will be important to further research is the wide variety of ways that adverse events were measured across the studies. While there may be issues with some of the measurement tools that were found in this study (Classen et al., 2011), the use of ICD codes without an expressed rationale or connection to previous literature complicates understanding of results and makes comparisons between

measured outcomes more difficult. It is strongly recommended that in future research on adverse events use standardized methods such as the AHRQ's Patient Safety Indicators (Smith et al., 2012) or the Institute for Healthcare Improvement's Global Trigger Tool (Classen et al., 2011) to allow for cross study and cross system comparisons.

For nurses and other healthcare providers, this review provides important information that will inform quality improvement during medical-surgical hospitalization for patients with psychotic disorders. The high rates of adverse events for these patients cuts across populations and systems of care. This review sufficiently identifies patients with psychotic disorders as a vulnerable population that require higher levels of assessment and interventions to prevent adverse events and other poor hospital outcomes. Providers must become comfortable with patients with psychotic disorders, especially around assessment, and work to dismantle the common stereotype that their reports of physical symptoms are psychiatric in origin. Additionally, finding the right medications, administration schedule and delivery route of medications for patients with psychotic disorders in the medical-surgical setting may be key to reducing postsurgical confusion and reducing risk of adverse events.

For researchers, the results of this review indicate that there are significant gaps in the scientific literature that must be addressed to fully address the healthcare needs of patients with psychotic disorders. It is unknown what factors, especially modifiable factors, drive adverse events in this vulnerable population. Length-of-stay in the hospital is be an important factor to consider (Hauck & Zhao, 2011), but the effect of processes (restraints, psychiatric medications), systems (hospital size, psychiatric services), and patient characteristics (medical comorbidities, race, gender) must also be further studied.

We must understand both the effects and the interactions between these factors so that policy and clinical care can be changed to address the needs of people with psychotic disorders.

In conclusion, adverse events are more common for patients with psychotic disorders than other patients, across systems and subpopulations. Unfortunately, we do not know what factors lead to or are associated with this outcome. Systems of care and healthcare processes may contribute to or prevent specific adverse events (i.e. post-surgical confusion, proper assessment by nurses) based on this review but it is unclear how much of this increased risk is due to different factors. Further research is required to better understand the health disparities around adverse events experienced by these patients and how to effectively predict and prevent them.

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Table 2.1

Search Terms and Strategy

Pubmed Search
((("Medical Errors"[Mesh] OR "Iatrogenic Disease"[Mesh] OR "Quality Indicators, Health Care"[Mesh] OR "Postoperative Complications"[Mesh] OR "adverse event" OR "adverse events")) AND ("Schizophrenia Spectrum and Other Psychotic Disorders"[Mesh] OR "Psychotic Disorders"[Mesh] OR "schizophrenia" OR "schizoaffective disorder")) 2002/01/01 to 2018/07/01 Results: 2018
CINAHL Search
(MM "Adverse Health Care Event") OR "adverse events" OR (MH "Sentinel Event") OR (MH "Postoperative Complications+") OR "postsurgical complications") AND ((MM "Psychotic Disorders+") OR "psychotic disorders" OR (MH "Affective Disorders, Psychotic+") OR (MH "Schizophrenia+") OR "schizophrenia") 2002/01 to 2018/07 Results: 497
Google Scholar Search
Psychotic Disorder/Schizophrenia/Schizoaffective Disorder/Serious Mental Illness Hospital/Hospitalization/Surgery Adverse Event/Surgical Complication/Outcome 2002 to 2018 Results: 14

Table 2.2

Reviewed Literature and QHOM Domains

Authors (year)	Population	QHOM Domains
Bailey et al. (2018)	From the National Inpatient Sample, patients experiencing the 4 most common surgeries were examined (n=579,851) with a sub-analysis of those with charted schizophrenia (n=5,234)	O
Bot et al. (2014)	Using the National Hospital Discharge Database, patients were identified who had shoulder arthroplasty, sub analysis of patients with schizophrenia (n=2,093) to those with no mental health diagnoses (n=324,406)	PC, O
Buller et al. (2015)	From the National Hospital Discharge, patients receiving primary total hip or knee arthroplasty Database with mental illness (n= 342,769; n= 8,947 with schizophrenia) or without mental illness (n=7,890,747)	O, PC
Copeland et al. (2015)	Department of Veterans Affairs patients admitted to the hospital (n=7,150,127), comparing those who had received surgery to those who had not	PR
Chen et al. (2011)	Patients with pneumonia, gathered using claims data from Taiwan's National Health Insurance, comparing those with schizophrenia (n=949) to a matched group of those without (n=2,847)	O, S, PC
Cooke et al. (2007)	US Veterans receiving surgery for appendicitis in the Veterans Affairs system with schizophrenia (n=55)	PC, O
Daumit et al. (2006)	Patients discharged from Maryland hospitals with a diagnosis of schizophrenia (n=1746) compared to those without (n= 732,158)	S, PC, O
Farasatpour et al. (2013)	Patients from the US Department of Veterans Affairs with schizophrenia or schizoaffective disorder and breast cancer (n=56) compared to those with no charted mental illness (n=478)	PC, O
Freudenreich and Stern (2003)	Authors summarize 74 requests for consultations and content of consultations involving patients with schizophrenia in non-psychiatric units at Massachusetts General Hospital	PR
Gholson et al. (2018)	Using the Nationwide Inpatient Sample, patients without a diagnosis of schizophrenia (n=504,887) and patients with schizophrenia (n=953) who had a total hip arthroplasty	O

Khaykin et al. (2010)	Using the National Inpatient Sample, identified patients discharged from US hospitals with (n = 269,387) and without schizophrenia (n = 37,092,651)	PC, S, O
Klement et al. (2016)	Patients from the US Medicare patient database who had undergone total hip arthroplasty with schizophrenia (n= 3,776) versus controls (n = 590,689)	O
Kudoh, Katagai, and Takazawa (2002)	Patients with schizophrenia in two Japanese hospitals undergoing orthopedic surgery were anesthetized with ketamine, propofol and fentanyl (n=38) or sevoflurane, nitrous oxide, and fentanyl (n=38)	PR
Kudoh, Takahira, et al. (2002)	Patients undergoing orthopedic surgery in Japanese hospitals with (n=50) and without (n=35) schizophrenia were compared	PC
Kudoh et al. (2003)	Patients in Japanese hospitals undergoing abdominal surgery with (n=70) and without (n=35) schizophrenia were assigned to epidural and non-epidural analgesia	PR, PC
Kudoh et al. (2004)	Patients undergoing minor surgery in a Japanese hospital with schizophrenia randomized to discontinuing antipsychotic medications 72 hours before surgery (n=52) or not (n=49)	PR
Liao et al. (2013).	Patients who had undergone surgery in the Taiwanese medical system, comparing those with schizophrenia (n=8967) to those without (n=2,001,445)	PC, S, O
Maeda et al. (2014)	Discharge data from a single Japanese hospital, comparing patients who had received surgery without (n=5,319) and with schizophrenia (n=104)	PC, O
McDonald et al. (2003)	Medical surgical nurses (n=60) in Australia presented with vignettes of control, anxiety and psychotic disorder patients	PR, S
Menendez et al. (2014)	Using the National Hospital Discharge Database, patients having spinal surgery were identified, with a sub-analysis of those with schizophrenia (n= 10,765) compared to those without (n= 5,382,343)	PC, O
Menendez et al. (2013)	From the National Hospital Discharge Database, patients with lower extremity fractures (n=10,699,449) were examined, of whom 0.6% had schizophrenia	PC, O
Schwartz et al. (2018)	Patient discharge data from California hospitals for those experiencing pelvic and lower extremity fracture (n=563,964) with a sub analysis of those with schizophrenia (n=769,528)	O

Smith et al. (2012)	US Veterans receiving surgery in the Veterans Affairs system with psychotic disorders (n= 50,328) and those without (n= 812,897)	PC, O
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Table 2.3

Process and System Findings

Authors (year)	Results
Copeland et al. (2015)	Process: Patients with schizophrenia were less likely to receive surgery than patients without SMI or other patients with a serious mental illness (AOR = 0.24, $p < .05$)
Chen et al. (2011)	Process: Patients with schizophrenia less likely to be treated by relevant specialists ($p < 0.001$) System: Patients with schizophrenia were less likely to be in medical centers, more likely to be in small, district hospitals, and in public hospitals ($p < 0.001$)
Daumit et al. (2006)	System: Patients with schizophrenia were more likely to be treated in teaching hospitals and trauma centers than other patients ($p < 0.001$)
Freudenreich and Stern (2003)	Process: Thirty percent of the consultations were simply for the presence of a patient with schizophrenia as medical providers did not know what to do. Difficulties with medication management and conflict with patient around decision making were also common reasons for consultation. Non-psychiatric staff overall did not seem confident in the care of patients with schizophrenia.
Khaykin et al. (2010)	System: Patients with schizophrenia were less likely to receive services in teaching hospitals and more likely to be in smaller hospitals ($p < .01$).
Kudoh, Katagai, et al. (2002)	Process: Patients sedated with ketamine, propofol and fentanyl had significantly lower rates of postsurgical confusion than those who received sevoflurane, nitrous oxide, and fentanyl (30% vs. 54%, $p < .005$).
Kudoh et al. (2003)	Process: There were no significant effects on post-surgical confusion or pain when using epidural or non-epidural analgesia.
Kudoh et al. (2004)	Process: The incidence of post-operative confusion was significantly higher for patients who had medication discontinued compared to those who had not (31% vs. 14%, $p = .0408$). Serious confusion such as hallucinations or paranoid delusions were also more common in patients who had medication discontinued.
Liao et al.	System: Patients with schizophrenia were significantly less likely to have their surgery conducted in a teaching hospital

(2013)	(p<0.0001).
McDonald et al. (2003)	Process: Nurses presented with vignettes of patients with psychotic disorders were less likely to respond adequately to symptoms of MI (35% vs. 51%, p<.05). System: Nursing education of a BSN level was predictive of correctly assessing patient symptoms as being indicative of an MI (p<.05).

Table 2.4

Patient Characteristics Findings

Authors (year)	Results
Bot et al. (2014)	Patients with schizophrenia had a significantly higher number of medical comorbidities compared to those with no mental illness (73% vs. 69%, $p<0.001$). When broken down by individual diagnoses, this relationship was only significantly increased for connective tissue disorders($p<0.001$)
Buller et al. (2015)	Patients with schizophrenia were not significantly more likely to have medical comorbidities ($p<0.001$). Patients with schizophrenia had significantly higher rates of thyroid disease, diabetes, obesity, and chronic pulmonary disease ($p<0.001$) and lower rates of hypertensive disorder, previous MI, coronary artery disease, atrial fibrillation, congestive heart failure, connective tissue disease and osteoporosis ($p<0.001$).
Chen et al. (2011)	Patients with schizophrenia had more medical comorbidities than other patients ($p<0.001$).
Cooke et al. (2007)	Almost 80% of patients presented with late stage appendicitis (66% perforated, 14% gangrenous).
Daumit et al. (2006)	Patients with schizophrenia had higher rates of COPD, diabetes, liver disease, AIDS and substance abuse ($p<0.001$) but lower rates of renal disease, cancer and previous myocardial infarction ($p<0.001$). Only 4.8% of patients with schizophrenia had private insurance, compared to 42.3% of other patients and they were more likely to be admitted via the emergency department than other patients ($p<0.001$).
Farasatpour et al. (2013)	Almost half (48%) of patients with a psychotic disorder and breast cancer delayed treatment longer than recommended after diagnosis (median= 481 days) and they were 5 times more likely to present with metastatic cancer (21% vs. 5%). Eleven of the patients with schizophrenia had a history of physically assaulting healthcare workers and 12 had a history of verbally assaulting them.
Khaykin et al. (2010)	Patients with schizophrenia were significantly more likely to have congestive heart failure, COPD, liver disease, diabetes, HIV/AIDS, and substance abuse ($p<.001$). Patients with schizophrenia also generally had lower income and were more likely to use public insurance, were more likely to be admitted through the emergency room and were less likely to have an admission for an elective procedure ($p<.001$).

Kudoh, Takahira, et al. (2002)	Plasma levels of both norepinephrine and cortisol at time of surgery and day after were raised in those patients with schizophrenia who had post-surgical confusion, compared to both those without confusion and controls ($p<.005$).
Kudoh et al. (2003)	Patients with elevated interleukin-6 during and post-surgery had significantly higher rates of post-surgical confusion ($p<.01$).
Liao et al. (2013).	Patients with schizophrenia more likely to have a comorbidity of hypertension, COPD, diabetes and stroke ($p<.0001$).
Menendez et al. (2014)	Patients with schizophrenia were more likely to have 1 or more medical comorbidities (63% vs. 45%, $p>.001$). These patients had higher rates of hypertensive disease, advanced diabetes, chronic pulmonary disease, renal disease, coronary artery disease, osteoporosis, and hemiplegia ($p<0.001$). There were no differences in cancer, AIDS diagnosis, chronic alcoholism or moderate-severe liver disease and significantly lower rates of diabetes, obesity, mild liver disease, history of MI, congestive heart failure, atrial fibrillation, thyroid disease, ulcer disease, specific cancers and connective tissue disease ($p<0.001$)
Menendez et al. (2013)	Those with schizophrenia had significantly higher rates of diabetes, obesity, chronic pulmonary disease, peripheral vascular disease, chronic alcoholism, thyroid disease, and AIDS ($p<0.001$). There was no significant difference in rates of general cancer and moderate-to-severe liver disease. Patients with schizophrenia had a significantly lower rate of hypertensive disease, mild liver disease, MI, chronic coronary artery disease, atrial fibrillation, congestive heart failure, cerebrovascular disease, osteoporosis, connective tissue disease, ulcer disease, hemiplegia and specific cancers ($p<0.001$).
Smith et al. (2012)	Patients with psychotic disorders were more likely to have chronic lung diseases, anemia, neurological diseases, hypothyroidism, liver disease, alcohol abuse, drug abuse, and AIDS ($p<.001$). They had lower rates of hypertension, diabetes, congestive heart failure, renal failure, peripheral vascular disease and all cancer diagnoses ($p<0.001$)

Table 2.5

Outcome Measurement and Findings

Authors (year)	Results
Bailey et al. (2018)	Outcomes Measurement: Surgical complications measured through discharge ICD-9 codes. No statements on how/why specific post-surgical complications and ICD-9 codes were chosen. Outcomes: Patients with schizophrenia had a higher risk of any surgical complication (OR= 1.3, $p<.001$) and prolonged length of stay (OR=1.64 $p<.001$).
Bot et al. (2014)	Outcomes Measurement: Adverse events measured through discharge ICD-9 codes. No statements on how/why specific adverse events and ICD-9 codes were chosen. Outcomes: Significantly greater rate of adverse events for patients with schizophrenia compared to those with no mental health disorder (24% to 16%, $p<.001$) and patients with schizophrenia were at high risk of adverse events even after controlling for diagnoses and demographics (OR=1.1).
Buller et al. (2015)	Outcomes Measurement: Adverse events were determined using the Complications Screening Program from (Iezzoni et al., 1994), which provides a list of postoperative complications and corresponding discharge ICD-9 codes for determining adverse events. Outcomes: Patients with schizophrenia had increased odds of having an adverse event during hospital stay (OR=1.561, $p<.001$). Patients with schizophrenia had significantly increased rates of postoperative infection, postoperative anemia, acute MI, pulmonary insufficiency, need for intubation and need for blood transfusion ($p<.001$), lower rates of wound complications, postoperative shock, postoperative bleeding, acute renal failure & DVT ($p<.001$). There were no significant differences for rates of PE.
Chen et al. (2011)	Outcomes Measurement: Presence of ICU admission, acute respiratory failure and mechanical ventilation taken from inpatient claims data. Outcomes: Patients with a diagnosis of schizophrenia had a greater risk of ICU admission (OR= 1.81), acute respiratory failure (OR = 1.37) and mechanical ventilation (OR = 1.34).
Cooke et al. (2007)	Outcomes Measurement: Presence of post-surgical complications found in chart review. No statement on how/why specific complications were chosen or coded. Outcomes: Approximately 55% of patients with schizophrenia had peri- or post-surgical complications and 4% had an in-patient mortality.
Daumit et al. (2006)	Outcomes Measurement: Discharge diagnoses coded for adverse events using the AHRQ's Patient Safety Indicators algorithms. Outcomes: Higher odds of hospital-acquired infection (OR= 2.49), post-operative respiratory failure (OR=2.08), post-op DVT (OR =1.96) and post-op sepsis (OR = 2.29). No significantly increased risk of decubitus ulcer, failure to rescue or hemorrhage.
Farasatpour et al. (2013)	Outcomes Measurement: Presence of post-surgical complications found in chart review. No statement on how/why specific complications were chosen or coded. Outcomes: Of those patients with a psychotic disorder who had surgery, 39% had a post-surgical morbidity compared to 12% of controls.
Gholson et al.	Outcomes Measurement: Medical and surgical complications measured through discharge ICD-9 codes. No statements on

(2018)	how/why specific complications and ICD-9 codes were chosen. Outcomes: Patients with schizophrenia had higher medical (OR 2.2, P <.0001) and surgical (OR 1.6, P <.0001) complications than matched controls. For specific complications, patients with schizophrenia had higher risk of acute postoperative hemorrhagic anemia (OR=1.630), altered mental status (OR=11.117), genitourinary complications (OR=1.861) and need for transfusion (OR=2.383). Pulmonary complications were especially likely (OR 15, P<.0133) for patients with schizophrenia compared to matched controls.
Khaykin et al. (2010)	Outcomes Measurement: Discharge diagnoses coded for adverse events using the AHRQ's Patient Safety Indicators algorithms. Outcomes: Increased rates of patient safety indicators associated with decubitus ulcer (OR = 1.43), infection due to medical care (OR = 1.19), postoperative respiratory failure (OR = 1.96), sepsis (OR = 1.59) and pulmonary embolism/DVT (OR = 1.23). Odds of iatrogenic pneumothorax and postoperative h hemorrhage were not significantly different. They also experienced a lower incidence of accidental puncture or laceration during surgery (OR=0.66). Patients with schizophrenia were significantly more likely to have congestive heart failure, COPD, liver disease, diabetes, HIV/AIDS, and substance abuse. Patients with schizophrenia also generally had lower income and were more likely to use public insurance.
Klement et al. (2016)	Outcomes Measurement: Complications were measured using ICD-9 discharge codes and Current Procedural Terminology codes. No statement on how/why specific complications and codes were chosen. Outcomes: Significant increase in most measured post-operative medical and surgical complications: Heart failure (OR=1.72), respiratory failure (OR=3.68), DVT (OR=1.38), stroke (OR=1.67), PNA (OR=3.22), sepsis (OR=3.77), acute renal failure (OR=1.61), postoperative anemia (OR=1.23), blood transfusion (OR=1.42), self-injury (OR= 1.56), bleeding complications (OR=1.67), periprosthetic infection (OR=3.34), cellulitis (OR=3.23), dislocation (OR=3.36), periprosthetic fracture (OR=2.76), osteolysis (OR=3.26), wound complications (OR=3.52), THA revision (OR=2.67), and arthrotomy (OR=2.72). Significantly lower odds of Arrhythmia with or w/o Afib (OR=0.82 & 0.58) but no significantly different odds of vascular/neuro injury, myocardial infarction or PE.
Liao et al. (2013).	Outcomes Measurement: Claims data for eight postsurgical complications were chosen based on previous literature (Khuri et al., 2005). Outcomes: Patients with schizophrenia had higher rates of any postoperative complications (OR=1.57) and significantly higher rates of postoperative mortality (OR = 2.7), acute renal failure (OR=3.92), pneumonia (OR=2.99), postoperative bleeding (OR=1.27), sepsis (OR=2.83) and stroke (OR = 1.39). Odds of postoperative myocardial infarction, wound infection, and PE were not significantly increased.
Maeda et al. (2014)	Outcomes Measurement: Post-surgical complications measured by ICD-10 discharge codes of selected relevant complications based on previous literature (Lkhagva, Kuwabara, Matsuda, Gao, & Babazono, 2012). Outcomes: Increased rate of post-surgical complications for patients with schizophrenia compared to general population (AOR =2.28).
Menendez et al. (2014)	Outcomes Measurement: Complications were measured using ICD-9 discharge codes. No statement on how/why specific complications and codes were chosen. Outcomes: Schizophrenia was associated with higher rates any in-hospital adverse events (33% vs. 16%, p<.001). Patients with schizophrenia had higher rates of wound complications, postoperative anemia, renal failure, ventricular arrhythmias and arrest, iatrogenic hypotension, PE, pneumonia, pulmonary insufficiency, DVT, need for intubation, need for transfusion (p<0.001). There were not significantly higher rates of postoperative myocardial infarction or conversion of cardiac rhythm.
Menendez et al.	Outcomes Measurement: Adverse events were measured using ICD-9 discharge codes. No statement on how/why specific complications and codes were chosen. Outcomes: Patients with schizophrenia were significantly more likely to have an in-

(2013)	hospital adverse event (OR=1.2, $p<.001$) but a decreased rate of in-hospital mortality (OR=0.17, $p<.001$). Rates of wound complications, acute post-hemorrhagic anemia, acute renal failure, pneumonia, DVT were all significantly higher ($p<0.001$) while rates of acute MI, arrhythmias, iatrogenic hypotension, PE, fat embolism, pulmonary insufficiency, intubation and cardiac conversion were all significantly lower ($p<0.001$). There were no differences for the rate of need for unexpected blood transfusion.
Schwartz et al. (2018)	Outcomes Measurement: Complications were measured using hospital diagnoses and procedures codes. No statement on how/why specific complications were chosen. Outcomes: Patients with schizophrenia had higher rates of surgical complications compared to those without (14.7% vs. 10.3%, $p<.001$) and prolonged hospital stay (45.2% vs. 28.5%, $p<.001$) but lower in-hospital death (1.8% vs. 2.3%, $p=.004$).
Smith et al. (2012)	Outcomes Measurement: Discharge diagnoses coded for adverse events using the AHRQ's Patient Safety Indicators algorithms. Outcomes: Higher rates of postoperative respiratory failure (AOR = 1.77), postoperative wound dehiscence (AOR = 1.74) and decubitus ulcer (AOR = 1.34).

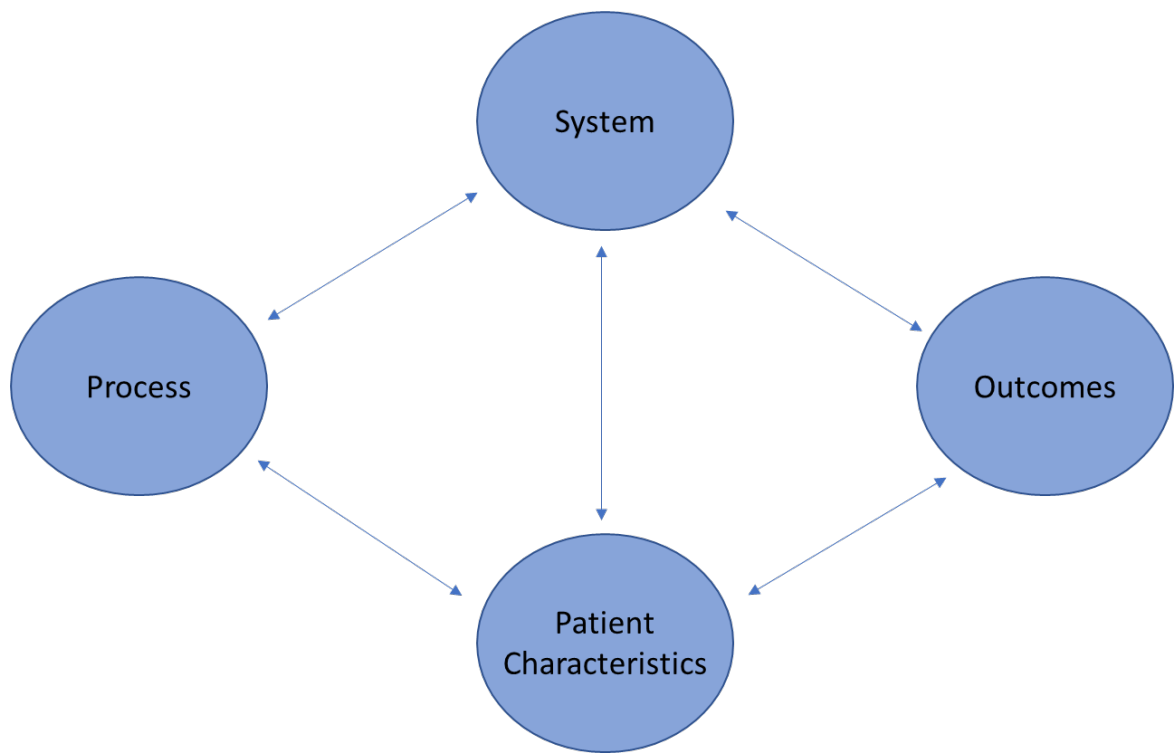


Figure 2.1 Quality Health Outcomes Model adapted from Mitchell et al. (1998).

Note. The original model used the term Intervention for Process and Client Characteristics for Patient Characteristics.

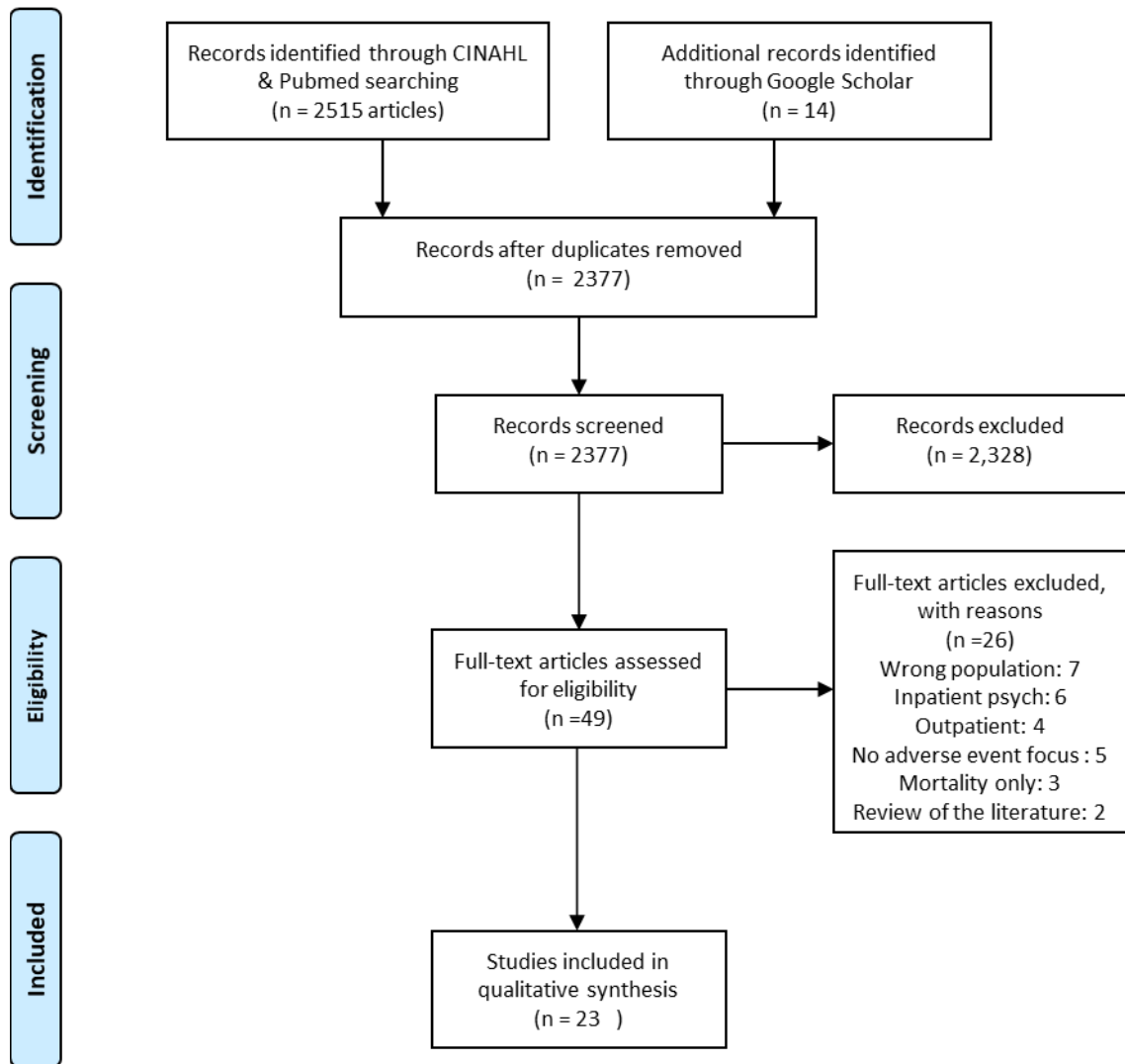


Figure 2.2. PRISMA Systematic review diagram.

CHAPTER 3:
EXPERIENCES OF HOSPITALIZATION OF PATIENTS WITH PSYCHOTIC
DISORDERS ON MEDICAL-SURGICAL UNITS: A THEMATIC ANALYSIS

Abstract

Individuals with psychotic disorders are more likely to have non-psychiatric hospitalizations than the general population. Moreover, they experience worse outcomes in terms of rehospitalization, adverse events, in-hospital mortality and longer length-of-stay. A patient-centered understanding of inpatient medical-surgical hospitalization experiences could shed light on disparities in hospital outcomes among individuals with psychotic disorders. This paper reports findings from Phase 1 of a mixed methods, exploratory sequential study of non-psychiatric hospitalizations of patients with psychotic disorders. Patients on medical-surgical units with diagnosed psychotic disorders ($n=20$) were interviewed about their experiences of hospitalization. Five themes emerged from thematic analysis of the transcribed interviews and setting notes: 1) *managing through hard times* (sub-themes: *intense emotions*; *medically complex with many symptoms*; *strategies for self-management*), 2) *ignored and treated unfairly*, 3) *actively involved in health* (sub-themes: *seeking health education*; *suggesting changes*), 4) *appreciation of caring providers* and 5) *violence: expected and enacted*. Participants connected the difficult nature of their hospitalization experiences with a variety of sources and outcomes, including strong emotions, variable relationships with providers and a struggle to receive health education. Nurses who care for patients with psychotic disorders in medical-surgical settings can better meet patients' needs by concentrating on relationship building, especially during initial interactions, and helping patients to better manage their medical and psychiatric symptoms through both pharmaceutical and nursing interventions.

Introduction

Psychosis, a disconnect from reality, is characterized by hallucinations, delusions and/or disorganized thoughts (APA, 2013) and the core symptom of a group of related psychiatric conditions known as psychotic disorders. National surveys estimate that more than 22 million Americans have a schizophrenia spectrum disorder (Kessler et al., 2005; McGrath et al., 2008; Messias et al., 2007). An additional 19% of people with a major depressive disorder and 48% of people with bipolar disorder experience significant psychotic symptoms during at least one mood episode in their lifetime (Dunayevich & Keck, 2000). In addition to social marginalization (Corrigan & Wassel, 2008; Perkins & Rinaldi, 2002) and psychological symptoms, people with psychotic disorders also have a high prevalence of medical comorbidities such as diabetes (Bushe & Holt, 2004), heart disease (Bresee, Majumdar, Patten, & Johnson, 2010) and infections like HIV and tuberculosis (Kuo et al., 2013; Walkup et al., 2010). While advances in both psychiatric medications and psychotherapeutic techniques have improved the lives of people with psychotic disorders (Hill, Bishop, Palumbo, & Sweeney, 2010; Zimmermann, Favrod, Trieu, & Pomini, 2005), the medical disease burden they experience has persisted (Azad et al., 2016; Batki et al., 2009; Hendrie et al., 2014).

Likely due to the high rate of complex medical conditions they experience, people with psychotic disorders are at higher risk for medical hospitalization (Cahoon et al., 2013; Daratha et al., 2012; Davydow et al., 2016). The outcomes of these hospitalizations are generally worse than for other patients, with an increased risk for rehospitalization (Chwastiak et al., 2014; Davydow et al., 2016; Sayers et al., 2007), adverse events

(Daumit et al., 2016; Khaykin et al., 2010) and in-hospital mortality (Bjorkenstam et al., 2012; Bozic et al., 2012; Daumit et al., 2016) compared to other patients.

A variety of factors could be at play that explain the poor outcomes of these patients in the hospital. There are deficits in provider assessment in both the outpatient and the inpatient setting experienced by patients with psychotic disorders (Crawford et al., 2014; Kisely, Campbell, & Wang, 2009), which may contribute to poor outcomes. People with serious mental illness, a related group of diagnoses, may have decreased rate of standard-of-care surgeries (Li et al., 2011; Wu et al., 2013). Nurses who work in non-psychiatric settings consistently reported that they do not have the training or skills to provide medical care for patients with high psychiatric need (Alexander et al., 2016; Rutledge et al., 2013). Healthcare providers have been found to have significant levels of stigma towards people with psychotic disorders, including both nurses (Alexander et al., 2016; Sathyanath, Mendonsa, Thattil, Chandran, & Karkal, 2016; Serafini et al., 2011) and physicians (Corrigan et al., 2014; Noblett et al., 2015; Welch, Litman, Borba, Vincenzi, & Henderson, 2015). Unfortunately, there remains a dearth of information on what happens during these patients' hospitalizations and how they experience medical-surgical hospitalizations.

Individuals with psychotic disorders are often excluded from research participation (Bracken-Roche, Bell, & Racine, 2016), removed from both qualitative and quantitative samples around hospital experiences and outcomes. The historical practice of excluding individuals with psychotic disorders not only negates their human dignity, but also leads to skewed interpretations and limits generalizability of the other findings to

this demographic (Bracken-Roche et al., 2016). A mixed methods approach then is valuable for exploring the experiences of this vulnerable population and then use their experiences to inform quantitative models of their outcomes (Stewart, Makwarimba, Barnfather, Letourneau, & Neufeld, 2008). By combining quantitative, empirical approaches with qualitative methods that lift up and center the voice of marginalized individuals, mixed methods provides a platform for not just cataloging disparities but understanding them in ways that make them more likely to be addressed (Creswell & Plano Clark, 2018). In hospital outcomes research, mixed methods studies have quantifiably linked patient reported experiences to poor outcomes (Brooks Carthon, Rearden, Pancir, Gamble, & Rothwell, 2017). This paper then serves to report a thematic analysis of interviews conducted during Phase 1 of a patient-centered, sequential exploratory mixed methods study of patients with psychotic disorders during non-psychiatric hospitalizations.

Methods

Phase 1 of this mixed methods study consisted of semi-structured, one-on-one interviews conducted with 20 participants hospitalized on medical-surgical units in an academic medical center. A mixed inductive-deductive model of code development and a thematic analysis approach were used to organize and interpret the results of interviews. For Phase 2, interview findings informed variable selection for an analysis of non-psychiatric hospital outcomes for patients these patients, which will be presented in a separate paper (Weissinger, Brooks Carthon, & Brawner, in preparation-b).

Setting and Participants

All participants were recruited from the medical-surgical units of a hospital in Philadelphia, PA. The hospital functions as a Safety Net hospital for the local community in addition to being a highly specialized academic medical center. There are seven medical-surgical units at the hospital from which participants were recruited. Five are specialty units (orthopedics, cardiology, thoracic surgery, etc.) and two were general medical-surgical units.

Potentially eligible participants were identified by staff through screening the electronic health record and nurses approached patients to ascertain interest in hearing more about the study. If the patient expressed interest, the interviewer explained the study and screened them to ensure eligibility. Study inclusion criteria were: (1) hospitalized on a non-intensive care unit (ICU) medical-surgical unit, (2) aged 18 and older, (3) a diagnosis of one or more of the psychiatric disorders with psychotic features (Schizophrenia, Schizoaffective Disorder, Schizophreniform Disorder, Delusional Disorder, Brief Psychotic Disorder, Bipolar Disorder with Psychotic Features or Major Depressive Disorder with Psychotic Features) present in the electronic medical health record, and (4) on an inpatient medical or surgical unit for a minimum of 24 hours. Participants were excluded if they had: (1) a diagnosis of dementia or delirium, (2) significant cognitive delay documented in their medical record or noted upon screening, (3) an inability to communicate fluently in English, or (4) a score below 14 on the UCSD Brief Assessment of Capacity to Consent (UBACC; Jeste et al., 2007). The UBACC was designed to test capacity to consent to research participation and was initially normed on a sample of individuals with psychotic disorders.

Participants from ICUs were excluded due to the high acuity and technical nature of that setting. Communication was likely to be hindered due to sedation, respiratory assistance machines and/or impaired cognitive status. Privacy would also have been more difficult, as nurses and other staff spend more time providing direct patient care in these settings. Finally, most ICU patients are not immediately discharged but transferred to medical-surgical units and thus became eligible for participation at that time. The hospital at which interviews took place did not have obstetric or postpartum units.

Human Subjects Considerations

This study was approved by the University of Pennsylvania Institutional Review Board (IRB) and all participants provided informed consent. Because of their psychotic disorder diagnoses, preliminarily eligible patients may have been unable to understand and appreciate participation in research so careful assessment was conducted. Though not legally considered a vulnerable population (Shivayogi, 2013), people with psychotic disorders should be assessed to ensure ethically sound research (Weissinger & Ulrich, In Review). Excluding individuals with psychotic disorders completely from research is ethically problematic but including individuals who are not capable of providing consent to participation in research is also unethical. Therefore, a structured assessment of capacity to consent was administered by the first author, a masters-level clinician, to determine if prospective participants were able to provide valid informed consent for research participation.

The UBACC (Jeste et al., 2007) was chosen because it is brief, assesses understanding of the research study itself rather than general knowledge or cognition, and was normed and validated in a population of individuals with psychotic disorders (2007).

Scores range from 0 to 20. If participants were unable to achieve a score of 14 or higher in the UBACC, they were deemed ineligible for participation. Additionally, participants who experienced significant hallucinations or delusions that interfered with their ability to answer questions during screening were excluded, based on the interviewer's clinical judgment. The UBACC's reliability in this study was inconsistent, with acceptable reliability for the sub-scale of Understanding (Cronbach's $\alpha = 0.531$) but a poor reliability for the Appreciation sub-scale (Cronbach's $\alpha = -0.154$). The negative reliability estimate for the Appreciate sub-scale may have been due to the small sample size relative to the number of items. Additionally, two of the items in this sub-scale scale had zero variance and one item demonstrated a significant negative item total correlation. If removed, the reliability score for this sub-scale became much higher (Cronbach's $\alpha = 0.404$).

In addition to participants' psychological symptoms, being in an inpatient hospital setting also created an extra level of vulnerability for these participants. For many, they felt that their life and/or functional status were in the hands of hospital staff and thus were vulnerable to feeling coerced to participate in research or give desirable answers. Their vulnerability may have also been exacerbated by the difficulty in achieving reliable privacy in a hospital setting. They are often being seen by doctors, nurses, nutrition staff and other hospital staff, in addition to visits from friends and family members. To address issues of setting coercion and privacy, interviews were scheduled during low activity periods of the day, in consultation with unit staff. The voluntary nature of the research and that participant data would not be shared at the individual level with hospital staff was stressed to all participants. Potentially eligible participants were given chance to

think about the study or discuss participation with family members and/or friends, if desired. During data collection, steps were taken to protect participants' privacy and information, including instructing participants not to use names or other identifying variables during the audio-recorded interviews, refraining from collecting identifying information (e.g., name, date of birth, address) and pausing interviews whenever staff entered the room or when requested by participants.

Procedures

After hearing the study description and reading all informed consent documentation, the participants were screened for eligibility and the UBACC was administered. Those who met inclusion criteria and expressed a desire to participate provided consent to participate and began the study. Participants completed a 10-minute survey which included demographics (e.g., age, race, ethnicity, gender, marital status), reasons for hospitalization and number of hospitalizations in the past year. All participants answered the Self-Reported Health-5 (SRH-5) and the Self-Reported Health-Age (SRH-Age), which are each single item measures that are highly correlated both with general physical well-being and longer measures of self-reported health (Eriksson, Undén, & Elofsson, 2001). Scores for the SRH-5 and SRH-Age were 5-point Likert scales, with a range from 1-5. Participants also completed the Brief Internalized Stigma of Mental Illness (Short Form), a 10-item version of the 29-item Internalized Stigma of Mental Illness scale (Boyd, Otilingam, & Deforge, 2014). This 10-item assessment has a final score range from 1 to 4 and similar validity to the longer form and good internal consistency and reliability (Boyd et al., 2014); reliability in this sample was poor (Cronbach's $\alpha = 0.29$), possibly due to the non-internalization of stigma even though they

reported experiences of marginalization and stigma from providers. Finally, each participant was administered the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure—Adult (Narrow et al., 2013). This 23-item psychopathology assessment tool uses the most common and/or diagnostically relevant symptoms of DSM-5 disorders to create a limited profile of mental health symptoms experienced in the previous 2 weeks but is not designed for diagnostic purposes. The subscales by diagnostic group in this instrument showed acceptable reliability in the sample (Cronbach's $\alpha = 0.63-0.83$). The DSM-5 Cross-Cutting Symptom Measure has one item per symptom, one to three per subscale of symptom cluster, scored from 0 to 4 and indicates frequency rather than intensity of psychological symptoms, with a minimum score of zero and a maximum score of 92.

The first author has experience in qualitative interviews and assessment of people with serious mental illness and performed all interviews. A study protocol was developed in collaboration with a doctorally-prepared advanced practice, mental health nurse. This protocol included responses to significant distress and/or suicidal ideation from participants. Interviews were audio-recorded, and the interviewer kept interview notes which documented verbal and nonverbal aspects of the interview not captured by the audio recording. Interactions outside of the interview period were captured in setting notes, which detailed interactions with hospital staff and family members as well as relevant information on the physical and social spaces of the hospital. Qualitative studies are conducted with a focus on data saturation, which occurs when there are no new themes emerging during qualitative data collection (Saunders et al., 2018). After

approximately the 16th interview, no new themes emerged but in total, 20 interviews were conducted to validate data saturation and to ensure the richness of the data.

Analysis

Audio-recordings were transcribed verbatim by a HIPAA compliant audio-transcription service and the first author compared audio-recordings to the transcripts to validate accuracy. All data were uploaded to NVivo (QSR International Pty Ltd, 2018) for data management, coding and review. Thematic analysis was used to guide code and theme development. This approach seeks to identify themes emerging from qualitative data, balancing both the information directly from participants and the interviewer/coder/analyst as a participant in pattern detection (Braun, Clarke, & Terry, 2014a). Using established procedures for qualitative coding (MacPhail, Khoza, Abler, & Ranganathan, 2016), the first author developed a deductive codebook based on the Quality Health Outcomes Model and an inductive codebook through iterative reviews of transcribed interviews and notes, based on the dual inductive-deductive approach outlined by Fereday and Muir-Cochrane (2006). Codes were then presented to the research team for consideration, refining as necessary.

After codebook development, the first and third author coded 20% of transcriptions ($n = 4$). One transcript was coded together, with differences in coding addressed through consensus reaching. The remaining transcripts three were coded separately and a strong interrater reliability was found ($\kappa=.92$). After coding, themes were developed through multiple close readings of coded materials and visualizations of code relationships. The research team reviewed the developed themes and provided feedback to improve clarity and qualitative rigor (Morse, 2015).

Results

Twenty-seven patients declined participation before completing screening. An additional 15 were screened but did not participate due to impaired capacity to consent ($n=3$), inability to communicate fluently in English ($n=2$) or high levels of medical symptoms they felt would make participating in the study painful or difficult ($n=10$). A total of 20 participants enrolled in the study, and all completed the study procedures. The average UBACC score was 16.55 ($SD = 1.731$) out of a possible score of 20, indicating that participants in this study overall were able to understand and articulate the terms of the study while appreciating the potential risks and benefits of participation.

The demographic characteristics of participants are presented in Table 3.1. Medical and mental health information of the sample are found in Table 3.2. Participants were predominantly African-American (60%), unmarried (65%), and living in a stable housing situation (95%). None of the participants were employed; the majority reported disability income (70%) and the remainder were unemployed or retired. At the time of interview, patients had been on the unit for an average of 7 days ($SD = 8.7$; range 1-30). The reason for hospital admission varied widely, with cardiac (25%), drug overdose (20%), co-occurring diabetes and pulmonary complications (15%) and orthopedic issues (15%) being the most common. For SRH-5 and SRH-Age, half of the participants rated their health as poor or quite poor, but 75% felt that their health was the same or better than others their age. The participants had a low result on the ISMI-10 ($\mu=2.15$), which indicates mild internalized stigma (Boyd et al., 2014).

For psychotic disorder diagnoses, bipolar disorder with psychotic features and schizophrenia were the most common and equally represented ($n=11$ for both), and nine

of the participants had more than one psychiatric diagnosis with psychotic features in their chart. Beyond these diagnoses, patients had a high burden of mental health symptoms; for the preceding two weeks, half of the participants symptoms of psychosis, 65% depression, and 50% anxiety. Two of the participants reported recent suicidal ideation, though none reported current suicidal ideation.

Themes

Five themes emerged from the analysis: 1) *managing through hard times*, 2) *ignored and treated unfairly*, 3) *actively involved in health*, 4) *appreciation of caring providers* and 5) *violence: expected and experienced*. The theme of *managing through hard times* had three sub themes: *intense emotions*, *medically complex with many symptoms* and *strategies for self-management* and the theme of *actively involved in health* had the sub themes of *seeking health education* and *suggesting changes*. A summary of the themes, sub-themes and illustrative quotes can be found in Table 3.3. Below, the themes and sub-themes are highlighted and discussed. Verbatim, unedited quotes are included to illustrate themes in participants' own words. After quotes or references to participant experiences, the participant's study ID number appears in bold (**P[participant number]**).

Managing Through Hard Times

Patients with psychotic disorders experienced hospitalization on a medical-surgical unit as being an intense experience; something that was psychologically and physically challenging but had to be endured. This theme emerged from three sub-themes: *medically complex with many symptoms*, *intense emotions*, and *strategies for self-management*.

Participants recognized that they were *medically complex with many symptoms*. They spoke about their complex medication conditions, both the reason they were hospitalized and unrelated comorbidities. These conditions often contributed to a high degree of physical symptom burden, with pain and discomforts being a constant of the hospital experience. One patient spoke about how she had come to the hospital after an overdose but also had an injured ankle that made walking difficult and painful(P8). Another stated, “I started to get sick. I couldn’t walk more than ten or 20 yards without being able to—I huffed and puffed, I couldn’t breathe and then I had a cyst on top of my head” (P11). The complexity of their medical conditions and the burden of the physical symptoms could be from long-standing conditions or be newly diagnosed:

“But I come in, they say, pneumonia, both lungs, didn't they? I said, ‘Damn, I feel nothing.’ They said, emphysema. I said, ‘Damn, I don't inhale, but I've been smoking since I was 13.’ So I'm like, ‘Damn, I'm really not paying attention to me and my health. I could die.’ They tell me diabetes. I mean, how the fuck did I get diabetes? But I’m glad all these things been picked up now” (P19).

These multiple medical conditions came with a high degree of physical symptoms, from intense pain to “Nauseous, diarrhea. Not being able to eat. My blood sugars were 300, 400s” (P20). The participants recognized that their health was impaired and knew that the symptoms they were experiencing reflected underlying health conditions, furthering their fear, sadness and frustration: “Just the symptoms that go along with the cancer. I mean, I’m dying. Metastasized. This is spread. Probably, all around the body. And that is really not...[fades off]” (P1).

Due to their medical conditions and the environment of the hospital, being hospitalized was a time of *intense emotions* for participants, with many of them

describing fear, anger, sadness and confusion dominating much of their day and psychological energy. Many spoke about how they had come to the hospital in acute distress, then waited for hours to be seen by providers or have diagnostic tests conducted. Others experienced frustrations in interactions with hospital staff, as one participant noted during an interview that her meal had come in with food that she could not eat, for the third meal in a row (P7). Finally, some were simply confused by the loud, fast-paced environment of the hospital, the constantly shifting staff and the break from their normal, stable lives. As one participant shared, “I was angry because I didn’t want to be in the hospital. This isn’t my bed” (P12). Though their frustrations may be shared by many hospitalized people, participants felt that they were particularly vulnerable:

“You got some people that have more serious mental health problems and actually laying in the bed like this can aggravate them. Just having to lay in the bed and be still that’s a pressure for people that can’t stay still or patience, it’s a big thing, and timing and people coming to them to take care of them. A lot of mental patients can’t handle it. They can get belligerent or get wild or crazy” (P14).

Participants also drew on their previous hospital experiences, especially psychiatric hospitalizations, which they acknowledged predisposed them to negative emotions: “You forget that you're not here for your mental inability, but you're here for a physical problem, and it's spooky when you come up here” (P12).

Though they had emotional and physical challenges during hospitalization, participants consistently identified *strategies of self-management* used during their time in the hospital. These strategies varied greatly, each unique to the individual’s social, psychological and physical needs. Those with close connections to their family spoke about how important it was that they visited or stayed with them, that they kept them

stable and helped them to cope. To these participants, relying on family was a part of their normal strategies of self-management and they tried to maintain this practice in the hospital: “That’s how it works. If I didn’t have him, my niece or my brother, somebody in my family always try to be there because it makes it easier, because I wasn’t always easy. But I’ve got a little better with it and I like the way it is, it works out better for me” (P9). Other patients used spirituality, alone or shared with others, to keep calm in the chaotic and unpredictable hospital environment. One participant spoke about his fear during the hospitalization and how he leaned on his faith:

“When I was admitted well, it was hard, things weren’t gonna fall in my favor. I just wanted to get back out in society when all was said and done. Thank god for Jesus. Oh Jesus, he was the birth. he’s the Lord, he’s my savior. The holiest. He’s my savior” (P18).

Other participants managed their experience of hospitalization through interactions with providers, usually by engaging with providers around medication. the medications they felt they needed to manage physical and psychiatric symptoms and get them on time. Many of the participants had medications that they took when outside the hospital but were given different medications or no medication when on the inpatient unit. They recognized their own symptoms and warning signs and so spoke to staff, often to the point of frustration by the providers, about receiving the appropriate medications. As one participant pointed out, these medications helped them to stay stable but without them, self-management became difficult:

“because when I take Abilify and Sertraline, the Zoloft, I’m a lot calmer, I hear clearer—like I can understand what someone’s saying to me. But when I don’t have my psychotropic medication, I’m a real bitch, because I don’t know how to be calm—I know how to be calm, but I don’t know how to reach in and get really calm” (P12).

These medications had to be given to them by nurses, per hospital policy, so participants tried to cultivate positive relationships with nurses. As per one participant, "My concern was to make sure I got all medications that I know I need to take. And they said the wrong thing and I don't want to make them feel uncomfortable because of my mental illness" (P9).

Even beyond medication, participants tried to engage with providers about their concerns and frustrations, noting that they often felt better when they knew that providers had listened to them. One participant, who was terrified of surgery, stated: "Because I'm scared to death. The only think I kept thinking about something's going to go wrong, something's going to go wrong. And they [the nurses] were like... ain't nothing going to go wrong, every thing's going to be fine" (P15). With reassurance, she was able to go through a procedure and noted that she was only able to do so because of their encouragement and assistance.

Ignored and Treated Unfairly

While not all participants felt that they were treated poorly because of their mental illness, many endorsed feelings of being treated differently and less personably by hospital staff. Participants reported many interactions they saw as negative, usually involving being avoided or ignored, that they felt that other patients would not have to endure.

"I don't know, they just make it seem bad that you got a mental illness and personally I think having a mental illness is like having diabetes or high blood pressure. But for some reason because you have a mental illness they just look at you differently, like something is wrong with you" (P10).

These interactions took a variety of forms, but most were persistent feelings of being ignored by providers and staff. One patient noted that: “I had to have one-on-one and they would talk to each other like I wasn’t in the room, that kind of thing....I don’t know. What’s the word for it? It discounts you” (P13). Another participant confirmed the sentiment of feeling discounted, stating:

“I would go cry in my room. No one would check on me or anything. I could have been back there doing God knows what. No one came back to check on me. I was like my room is way in the back. No one checked on me and made sure I was alright. It happened a few times where I would be crying in my room...I think they were just ignoring me. They didn't really care” (P4).

These interactions made participants feel marginalized, being less worthy of care and consideration than other patients in the hospital.

Some participants felt these interactions stemmed from lack of knowledge and comfort that providers had working with people with psychotic disorders. One explained:

“They don’t understand the illness. They—some people think that all mentally ill people are bad and they think that they—on the TV the first thing they say is “Do they have mental illness” when people kill people or something” (P10).

In the end, participants who experienced these kinds of interactions with providers noted that they did not want special treatment, simply that: “[The providers] don’t have a complete understanding...I don’t know - I can tell when I’m being looked - treated differently, and I don’t really like it...They’re just being precautions, but still I think that, I don’t know, I’d like to be considered more sane” (P8).

Actively Involved in Health

Participants in this study did not see themselves as passive recipients of healthcare. Rather, they spoke about how they were working to manage their own health, both at the hospital and at home. They made decisions throughout the process of

hospitalization that helped move them toward the outcomes they desired, usually focused on symptom management and leaving the hospital prepared. To start, many patients spoke about how they chose this specific hospital, sometimes even leaving other hospitals, because they felt that it had the best care for their specific needs. One participant spoke about how he had to make the strategic decision to focus on his chest pain, instead of depression and hallucinations, in the emergency room so that he could get timely care:

“When I got here, I said—and there was a lot of people out there. I asked them, I said, how long? How long do you think before I’ll be seen by a doctor? They said about four hours. So, I said, ‘I better concentrate on the physical things rather than-They would have made me wait for four hours. I just concentrated on the physical things” (P13).

This participant knew from his experiences with the healthcare system that if he had concentrated on his mental health symptoms, then his wait for care would have been longer but by putting his physical health symptoms forward, he received more prompt care and was found to be experiencing a small heart attack.

Other participants felt that they could be actively involved by helping physicians and nurses, even for small tasks, as it helped them to feel engaged. One participant, when asked about particularly good interactions with nursing staff, reenacted a scene where she had to ask help for incontinence care: "Excuse me. I hate to be a burden, but can you kindly?" She says, 'Don't worry about it.' That angel. She says, 'It's my job to do.' I said, 'But let me help you.' And we do it together. I'm just too weak to do it myself. That's respect" (P19). Even when asking for help, they wanted to be active participants in their time in the hospital. Two sub-themes emerged besides general active engagement with

care; patients were *seeking health education* during their time in the hospital and *suggesting changes*, to the interviewer and to their providers, about improving care for themselves and other patients like them.

Participants in this study were *seeking health education* because they felt that it would give them the power to manage their own illness, leave the hospital quicker and prove to providers that they were capable of being involved. Participants believed that if they were able to understand their medications and to develop a plan with their providers, they would be more in control and not have to return to the hospital. As their medications and treatments changed often in the hospital, many reported frustrations when compared to more stable home regimens, but they asked questions and used the internet to find more information. They wanted to know as much as possible, so that they would be involved in discussions about their care and disposition. One participant spoke about how she wanted to know more about her treatments and it led to an important change in how others saw her: “I said, ‘well what is the medicine for’, and then they explain to me. And I know kind of what meds are they giving me, for treating with...And therefore, then I know what is going on. Say ‘Oh?’, and then they explain it to you...they look at me later, and surprise...Then they saw—I am engaged in my health.” (P3).

When unable to get what they wanted, some participants took alternative paths to receiving adequate health education. One participant called the company that constructed her insulin pump: “They wrote it down for me and still I was having trouble so I called [Device Company]. They help me through any medical problems that you might need...And I’ve been calling them just to make sure I was doing the right thing.” (P20).

Another looked up information on her phone about the surgery that she had received and then used this information to ask more detailed questions of nurses (P7). However the method, participants did not see themselves as passive recipients of health education but seekers of knowledge. Most felt that, due to the need to come into the hospital, they required more education more before being able to care for themselves successfully; this drove them to find ways to cover their knowledge gaps.

In addition to seeking health education, participants also *suggested changes* they felt would improve the experience of medical-surgical hospitalization for patients with psychotic disorders. Some of these suggestions were given to the interviewer and others were given directly to providers and told to the interviewer as asides during the interview. Overall, they were generally focused on how the system failed to adequately meet the needs of those with both mental health problems and medical problems. Multiple participants spoke about a desire for therapy, individual or group, during medical-surgical hospitalizations that would help them cope with the experience. They felt that the providers they interacted with often did not even think about mental health concerns and so they had no one to speak to about their psychiatric concerns. One participant said: “I think someone should ask them about their mental health diagnosis. If they do have one, maybe someone should come in and talk to them, a therapist or a social worker, or something...Because it can be depressing being in the hospital” (P4). Another stated “I think what I would like to see more is an inclusion of - when you see in psych hospitals there's groups, and I think they have some sort of get you out of your room activity, at least one a day. That would be nice. It gets kind of isolating.” (P8)

Besides the desire for psychiatric support, participants also had other suggestions for improving care that were based on conflicts between their preference and hospital policies. One participant wanted a chance to walk outside or smoke when she was medically stable as she felt trapped on the unit by hospital policy (P12). Others focused on interactions with providers and how they could be improved, primarily recommending that providers: "Pay attention to the patient. If you care, stay in the field, you have to care. And don't be a doctor or nurse that don't care, because if you don't care, you might as well be sweeping the streets." (P19). Another acknowledged that providers are busy, but they need to "Just take the time and let a person with mental illness talk. Listen to them. Don't just jump down and throw them a bunch of medicine and stuff. Give them a chance to explain how they feel. That makes a big difference." (P14).

Appreciation of Caring Providers

Though participants did not always have positive interactions with providers, they were especially *appreciative of caring providers* who treated them with dignity and respect while addressing their needs. Many of the participants had sought out this particular hospital because they felt that the providers were more likely to treat them with respect. They were adamant that the interviewer had to know about their best interactions with providers and why they valued them. One participant stated:

"Because the way they correspond with me. They are courteous and polite and they give you that warm feeling of letting you know you can open up to them. That persona, they show you that you can warm up to them, they warm up to you and you can tell them anything. They don't make me feel like I got to be ashamed." (P9).

While another really appreciated her nurse because "That's the way that she talks to me; she talks to me like I'm a person." (P12). This idea of being "treated like a person" and

kindness from providers was of importance for many of the participants. One participant spoke about being visited by an outpatient social worker because “I really appreciate that they care about me, because she didn’t have to come over here to see me. It would be easy for her to make her money but she just come over and say hi. She doesn’t have to care that much about me. She put a lot into it” (P13). In the end, participants felt that the best providers: “They’re personable. They look at you like you’re an individual not a part of the mass” (P11) and they are “more than nice to me. They support me” (P5).

Violence: Expected and Enacted

While violence was not discussed by all participants, the subject of *violence, expected and experienced*, was present in a subset of interviews and setting notes. Some participants spoke about how people with psychotic disorders were associated with physical violence, though carefully noting this is a perception of the staff and not their own perceptions. Four study participants reported times in which they threatened or performed physical violence against hospital staff members, though only one was during the current hospitalization. One participant said she had “picked a lady up by her shirt, and told her if she said one more wrong thing to me, I was gonna sock her.” (P12).

Another participant told a story about first entering the unit and having security called because she threatened to punch a nurse she felt was disrespecting her. “If you treat somebody that way, they’re going to attack you. I bust a couple on my own. They ignorant, so I said, “Here’s one for you, ignorant motherfucker!” [shakes fist] (P19).

Overall though, participants noted that they were not acting physically aggressive because of their mental illness but, as one participant put it “Fear makes me lash out, fear makes me angry.” (P12).

Indeed, while not blaming providers per se, participants that spoke about violence were emphatic that it was a response to an interaction between their mental health and others' reactions: "If I'm agitated and upset then I project it off onto the people that are taking care of me. And sometimes they don't understand that it's my mental illness. And so it gets to be not so pleasant." (P10). Another remarked, "Mental health means a lot, because if you're angry, you're going to treat them angrily, and they're going to treat you nasty. And nasty cause nasty. Ignorance because of ignorance. You may be in pain, but they're not the ones that gave it to you" (P19). Though acknowledging that they were more vulnerable to these reactions than others, they felt that if they had been treated more respectfully and kindly, they would not have had to resort to a violent response. Violence, in their opinion, happened because "only a certain amount of level I can take before I go off, like I'll hit you and go off and just go in and not think about you at all because you're not thinking about me" (P9).

Discussion

Given the poor outcomes that people with psychotic disorders experience during non-psychiatric hospitalizations, it is vital that we understand their experiences of hospitalization. Without an understanding of how a population experiences the healthcare system and the disparities that we find, effective interventions will be difficult and poor outcomes will continue. The patient-centered approach adopted for this study fills a clear gap in knowledge for the target demographic. For patients with psychotic disorders on medical-surgical units, the themes that emerged from the analyses indicate that these patients want to be more active participants in their healthcare but feel stymied in these efforts. They feel that certain providers and policy/systemic factors make it harder to

endure the intense physical and emotional burden they experience during hospitalization, though positive interactions with certain providers were important and provided comfort during this difficult time.

To the authors' knowledge, this was the first study to examine the perspectives of patients with psychotic disorders on medical-surgical units similar results have been found in qualitative research of similar populations and settings. Overall, medical-surgical patients who were interviewed about their experiences wanted to be actively engaged in their healthcare, especially around decision making and being physically involved in assisting with care processes (Ringdal, Chaboyer, Ulin, Bucknall, & Oxelmark, 2017; Tobiano, Bucknall, Marshall, Guinane, & Chaboyer, 2016). Tobiano and colleagues (2016) found that patients wanted to be involved but also felt stifled in this desire, that hospital processes happened "to them" rather than "with them." Zolnierrek (2013a) examined the experience of patients with serious mental illness in medical-surgical hospitalizations, highlighting similar themes to the current study, with patients reporting a desire to be more involved, feeling uncared for and needing to work hard to manage their mental health in a non-mental health setting.

In non-medical-surgical settings, Stumbo, Yarborough, Yarborough, and Green (2018) found that though 88% of patients with mental illness wanted more health education and recommendations for staying healthy from their primary care providers. Conversely, over half of the surveyed providers felt that patients with mental illness cared less than other patients about their health. Primary care providers reported working to keep information simple and short, while patients with mental illness actually reported

wanting more complete information, with concrete recommendations about health behavior change, rather than simplifications. Lester et al. (2003) showed that patients with schizophrenia valued their relationships with primary care providers, especially “where they were treated as equals and were actively involved in decision making about their health care” (pg. 511). Unfortunately, these patients rarely received adequate health education and this ideal interaction was rarely realized. In a meta-synthesis around psychiatric medication adherence, people with schizophrenia knew little about their psychiatric medications but highly valued health education around medications and providers who gave it (Salzmann-Erikson & Sjödin, 2018). Thus, the valuing of certain providers while recognizing problems in their interactions with providers appears to stretch across settings for patients with psychotic disorders.

For some patients, past experiences of psychiatric hospitalization informed the experience of medical-surgical hospitalization in this study. These experiences may have predisposed them to negative interactions with providers and the hospital system. Patients describe psychiatric hospitalizations as disempowering and claustrophobic (Shattell, Andes, & Thomas, 2008), even if they are sometimes necessary to protect patients. While providers strive for a therapeutic milieu, patients in psychiatric units feel isolated, shame and cut off from general human contact (Lilja & Hellzén, 2008; Rüsç et al., 2014). Though they may not be involuntarily committed, many of these sentiments were echoed by participants in this study. The patient who expressed that they temporarily forgot they were at the hospital for a medical issue emphasizes that hospital experiences occur in the context of patients’ lives and history, including previous psychiatric hospitalizations, and

providers must be aware of how this may change a patient's view of medical-surgical hospitalization.

The experiences of being ignored, avoided and treated differently reported is critically important as this kind of experienced stigma for a marginalized group can have devastating consequences. The participants' statement that she just wanted to be "considered more sane" rings especially true because of the often covert nature of prejudice and stigma in healthcare interactions (FitzGerald & Hurst, 2017; Van Boekel, Brouwers, Van Weeghel, & Garretsen, 2013). Even for conditions that have high rates of stigma from healthcare providers, like psychotic disorders (González-Torres et al., 2007; Noblett et al., 2015; Vass et al., 2015), stigma is rarely acted on openly in interactions with patients. Rather, it presents covertly through stereotypes and restrictive attitudes (Alexander et al., 2016; Noblett et al., 2015; Sathyanath et al., 2016). Because of stigma, interactions with the patient may decrease and providers can become overly prescriptive, presenting only a narrow range of options to the patient. Stereotypes and fears about the people with psychotic disorders makes them see the patient as dangerous or incompetent. Unfortunately, due to the implicit nature of these stereotype-based interactions, patients are often not able to point to single events or behaviors that should be changed so collected narratives, such as this paper, provide important information for providers.

The extreme positive reactions that participants had toward specific providers is important, as it relates to their feelings of often being ignored and avoided. People with mental illness often feel that their concerns are ignored or downplayed by others (X*). People with psychotic disorders do not always experience reality in the same way as

others so often have the experience of being disbelieved by others (X*). Even so, people with psychotic disorders recognize their needs and have at least some understanding of what is happening to them, even during a period of psychosis (Bø et al., 2016). When providers address them personally, take time to education them and engage in active listening, patients with psychotic disorders feel calmer and more satisfied with care. Providers, especially those who are uncomfortable with individuals with psychotic disorders, may avoid people with psychotic disorders. Despite this, providing health education and truly engaging with patients may decrease the psychological symptoms they experience and could make the hospitalization easier and safer for patients and providers.

Finally, violence, though only brought up by a few patients and nurses in setting notes, also bears further discussion. Physical violence against hospital staff, especially nurses, is unfortunately a common occurrence. As many as 15% of nurses working on medical-surgical units report being physically assaulted in the last 5 shifts (Roche et al., 2010) and violence experienced by nurses has been associated with worse patient care and outcomes, even for other patients than those who engaged in the violent behavior(Roche et al., 2010). Like the rationale reported by our patients, experiences of frustration, loss of control and disorientation are often precursors to violence on medical-surgical units(Ferns, 2007). Violence then, for the participants in this study and in other studies, appears to be a combination of low frustration tolerance related to their mental illness and physical and emotional struggles rather than a direct result mental illness, though providers who experience violence may not make that connection.

While a nurse on one of the floors used for recruitment made a direct connection between patients with psychotic disorders and violence, the relationship between violence and people with psychotic disorders is much more complex than it appears. Schizophrenia and other psychotic disorders, while originally diagnoses of the rich and withdrawn White patient, gradually became associated with danger and violence, especially in Black male individuals (Metzl, 2010). The association grew over time that psychosis made individuals inherently violent, backed by earlier psychological and sociological research (Buckley et al., 1990; Yesavage, 1983). More recent meta-analyses have found that substance abuse, rather than psychotic disorders and symptoms, are actually the factor that drives violent crime in this population (Fazel, Gulati, Linsell, Geddes, & Grann, 2009). Unfortunately, these nuanced findings have not been widely accepted, as popular media continues to associate people with psychotic disorders with violence (Owen, 2012). Even psychiatric nurses and physicians continue to hold this stigma (Chen & Chang, 2016; Linden & Kavanagh, 2012; Mittal et al., 2014). Previous research on violence in hospitals has focused on system factors (Ferns, 2007) and psychiatric settings (Iozzino, Ferrari, Large, Nielssen, & De Girolamo, 2015), so the relationship between violence and individuals with psychotic disorders in this setting bears further research and careful consideration to fully understand it and to not simply affirm existing stereotypes.

Though there were important findings in this study, there are limitations that must be acknowledged. The sample was a convenience sample in a single hospital, part of an academic medical center and not representative of all hospitals. The participants also

skewed older, with an average age of 55. While younger individuals are less likely to have medical-surgical hospitalizations, their experiences may differ from those of this older sample. Also, by design, this study excluded those individuals who were unable to provide informed consent, either due to psychotic symptoms or cognitive deficits and there were individuals who, due to medical symptoms, were unable or unwilling to participate in the study. There were perspectives missed which may have given a fuller understanding of the experiences of these patients. Finally, the use of individuals who were currently hospitalized, while a strength because events discussed had happened recently or were ongoing, also presents a limitation as patients were not able to reflect on their entire hospital experience. While patients were interviewed later in their hospital stay spoke about difficulties identifying next steps and finding placements, the extended length-of-stay they experience that these patients experience (Daumit et al., 2006; Khaykin et al., 2010) was not able to be explored.

Another important limitation is the poor reliability found in the measures used to measure internalized stigma (ISMI-10) and capacity to consent to research participation (UBACC). While the UBACC was created for and normed on individuals with a psychotic disorder (Jeste et al., 2007), its purpose was originally to measure capacity to consent for randomized controlled trials. Interventional studies have clearer risks and benefits than qualitative interviews, especially when participants are told that their monetary compensation does not count as a benefit. The Appreciation sub-scale may suffer because the risks and benefits of this kind of research are less clear and more open to interpretation than that which might be found in a pharmaceutical trial. There may be a

need for assessment of capacity measures that is valid and reliable for qualitative studies, surveys and other forms of non-interventional research.

The ISMI-10 (Boyd et al., 2014) also demonstrated poor reliability in this study. While the exact cause of this poor reliability is unknown, several factors may have played a part. The ISMI-10 was normed on veterans in the United States Veteran's Affairs health system, all of whom were receiving outpatient mental health treatment. The participants in that study also had a wide variety of mental illnesses and few had psychotic disorders. These population differences and setting differences may have negatively affected the reliability of the measure. Further research is necessary to better understand how to measure internalized stigma in the population of individuals with psychotic disorders hospitalized on medical-surgical units.

Despite these limitations, this study provides important information about the medical-surgical hospitalizations of people with psychotic disorders. Furthermore, more research is required to address the needs of this vulnerable population. Quantitatively, a better understanding of hospital outcomes and an understanding of what factors drive their poor outcomes is necessary. While this study provides important patient-level perspectives, risk profiles should be developed to identify patients who need specialized resources or care processes to prevent poor hospital outcomes. Qualitatively, additional work must be done to understand patients with psychotic disorders experiences of other hospitalization processes, like discharge planning and transitions to home or other facilities. Additional information is also necessary about provider experiences and preferences around caring for patients with psychotic disorders in this setting.

While further work must be done, practice and policy recommendations can be drawn from this work: 1) Nurses and other healthcare providers who work with patients with psychotic disorders on inpatient medical-surgical units should strive to provide consistent, quality health education; 2) patients with psychotic disorders often experience both medical and psychiatric symptoms that make their stay in the hospital uncomfortable, so efforts should be taken to ensure that they receive appropriate medications, like psychotropics and pain relievers; 3) patients with psychotic disorders may feel isolated or ignored on inpatient units so, even when a patient's understanding of reality is impaired, efforts should be made by providers to verbalize and socially engage with them; and 4) policies should be developed to connect patients with psychotic disorders to family, spiritual communities, outpatient mental health providers or other resources that may help them to better cope with the physical and psychological discomfort of hospitalization.

Patients with psychotic disorders who are hospitalized on a medical-surgical unit are in an inherently difficult situation, exacerbated by their mental health status. Overall, their physical and psychiatric symptoms create a high burden and they experience stigma from providers that make getting the care and health education that they need difficult. The results of this paper will help nurses and other providers to see the hospitalization experience from these patients' perspectives. By better understanding the experiences of these patients, nurses and other healthcare provider will be able to deliver more effective care and education, potentially reducing the poor hospital outcomes they experience.

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Tables and Figures

Table 3.1

Participant Demographics

Characteristics	N% or Mean (range)
Female	11 (55%)
Age	55.05 (32-68)
Race	
Black or African-American	12 (60%)
White	5 (25%)
Mixed-Race	3 (15%)
Hispanic or Latino Ethnicity	2 (10%)
Relationship Status	
Married or Partnered	3 (15%)
Divorced or Widowed	4 (20%)
Single	13 (65%)
Stable Housing (rent or own house/apartment)	19 (95%)
Employment	
Unemployed	3 (15%)
Disability	14 (70%)
Retired	3 (15%)
Education	
Did not graduate high school	6 (30%)
Completed high school	4 (20%)
Some college or technical degree	5 (25%)
Completed college	4 (20%)

Post-graduate degree	1 (5%)
Internalized Stigma (ISMI-10)	2.15 (2.9824
Capacity to Consent (UBACC)	16.55 (1.73)
How would you rate your general health status? (SRH-5)	2.35 (.988)
Poor (1)	5 (25%)
Quite poor (2)	5 (25%)
Neither good nor poor (3)	8 (40%)
Quite good (4)	2 (10%)
Very good (5)	0 (0%)
How would you assess your general health status compared to that of others your own age? (SRH-Age)	3.10 (1.07)
Much better (1)	2 (10%)
Slightly better (2)	3 (15%)
Neither better nor worse (3)	7 (35%)
Slightly worse (4)	7 (35%)
Much worse (5)	1 (5%)

Table 3.2

Medical and Mental Health Information on Participants

Characteristics	N% or Mean (range)
Unit Type	
General Med-Surg	12 (60%)
Surgery	3 (15%)
Orthopedics and Trauma	3 (15%)
Cardiac	2 (15%)
Reason for Hospitalization	
Cardiac	5 (25%)
Overdose	4 (20%)
Orthopedics	3 (15%)
Diabetes & Pulmonary (co-occurring)	3 (15%)
Gastrointestinal	2 (10%)
Infection	2 (10%)
Pain (Oncology)	1 (5%)
Number of days in hospital at interview	7.5 (1-30)
Number of hospitalizations in the past year	4.85 (1-22)
Psychotic Disorder Diagnoses^a	
Schizophrenia	11 (55%)
Schizoaffective Disorder	2 (10%)
Bipolar Disorder with Psychotic Features	11 (55%)
Major Depressive Disorder with Psychotic Features	2 (10%)
Mental Health Symptoms^b	

Psychosis (any)	10 (50%)
Depression (more than half of days)	13 (65%)
Problems Sleeping (more than half of days)	13 (65%)
Anxious or Panicked (more than half of days)	10 (50%)
Suicidal Ideation (any)	2 (10%)

Note. ^aSome participants had more than one diagnosis of a psychotic disorder

^bOver the past two weeks

Table 3.3

Themes and Selected Illustrative Quotes

Theme	Description	Illustrative Quotes
Ignored and Treated Unfairly	Participants spoke on negative interactions with healthcare providers where they were avoided or ignored and felt they were treated differently . They feel providers lacked comfort with psychiatric disorders .	“And that’s why I always say I don’t want to be treated like a psychiatric patient. I’m a patient.” P3 “They don’t have a complete understanding...I don’t know - I can tell when I’m being looked - treated differently, and I don’t really like it...They’re just being precautions, but still I think that, I don’t know, I’d like to be considered more sane.” P8 “It felt like they didn’t want to take care of me because I have a mental illness, like I had something you could catch. You can’t catch it.” P10 “I had to have one-on-one and they would talk to each other like I wasn’t in the room, that kind of thing...I don’t know. What’s the word for it? It discounts you.” P13

Violence: Expected and Enacted	Participants and nurses noted that patients with psychotic disorders were associated with physical violence , as well as threats of physical violence , which related to staff fear and patients' experiences of fear and anger .	"Only a certain amount of level I can take before I go off, like I'll hit you and go off and just go in and not think about you at all because you're not thinking about me" P9 "...I picked a lady up by her shirt, and told her if she said one more wrong thing to me, I was gonna sock her." P12 "Fear makes me lash out, fear makes me angry." P12 "If you treat somebody that way, they're going to attack you. I bust a couple on my own. They ignorant, so I said, "Here's one for you, ignorant motherfucker!" [shakes fist] P19 "A person's mental health means a lot, because if you're angry, you're going to treat them angrily, and they're going to treat you nasty. And nasty cause nasty. Ignorance because of ignorance. You may be in pain, but they're not the ones that gave it to you." P19 "Haldol. It doesn't help them but it keep them from digging their claws into you, verbally or physically." Nurse, from Setting Notes
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Appreciation of Caring Providers	Participants appreciated the work of providers who engaged professionally, providing nursing/medical services based in respect, care and being nice. It was important to be treated as an individual by staff.	“A lot of hospitals, if I’m asking a bunch of questions, it drives them crazy. And they don’t really want to do their job. They’re just there for the money I guess. I don’t know. But this hospital, it seems to me that they are professional, and they do their job to help people and actually care for us.” P2 “That’s the way that she talks to me; she talks to me like I’m a person.” P12 “Because the way they correspond with me. They are courteous and polite and they give you that warm feeling of letting you know you can open up to them. That persona, they show you that you can warm up to them, they warm up to you and you can tell them anything. They don’t make me feel like I got to be ashamed. They don’t say everything.” P9 “They’re personable. They look at you like you’re an individual not a part of the mass.” P11
Actively Involved in Health	Participants discussed how they are trying to manage their own health, by <i>seeking health education (ST)</i>, <i>suggesting changes (ST)</i>, being an active participant in healthcare, ensuring they receive psychiatric medications and emphasizing different symptoms as needed.	“My concern was to make sure I got all medications that I know I need to take. And they said the wrong thing and I don’t want to make them feel uncomfortable because of my mental illness. So, that’s why I correspond with them, I want them to understand.” P9 “When I got here, I said—and there was a lot of people out there. I asked them, I said, how long? How long do you think before I’ll be seen by a doctor? They said about four hours. So, I said, ‘I better concentrate on the physical things rather than’—I was ashamed to tell them about the mental thing because I knew they don’t take it as serious. They would have made me wait for four hours. I just concentrated on the physical things.” P13 "Excuse me. I hate to be a burden, but can you kindly?" She says, "Don't worry about it." That angel. She says, "It's my job to do." I said, "But let me help you." And we do it together. I'm just too weak to do it myself. That's respect" P19

<i>Seeking Health Education</i>	In addition to general strategies, participants spoke specifically about wanting and receiving health education in communication with nurses and physicians , as well as with others.	“If the doctor came in and was like, “Oh, okay, well, you know, this is what we're going to do.” We're going to give you this med” and leave the room. I wouldn't be.... I think that would be rude. I would probably be upset by that, if I wasn't able to ask questions and be informed.” P4 “They wrote it down for me and still I was having trouble so I called [Device Company]. They help me through any medical problems that you might need...And I've been calling them just to make sure I was doing the right thing.” P20 “I said, well what is the medicine for, and then they explain to me. And I know kind of what meds are they giving me, for treating with...And therefore, then I know what is going on. Say ‘Oh?’, and then they explain it to you...they look at me later, and surprise...Then they saw—I am engaged in my health.” P3
<i>Improving Care, Meeting Needs</i>	Participants gave recommendations , both to providers and to the researcher, on improving care to meet the needs of their population. These suggestions ranged from communication changes to addressing issues in the hospital as a system .	“I think when people are hospitalized, I think someone should ask them about their mental health diagnosis. If they do have one, maybe someone should come in and talk to them, a therapist or a social worker, or something...Because it can be depressing being in the hospital” P4 “I like the set up in here...but I think what I would like to see more is an inclusion of - when you see in psych hospitals there's groups, and I think they have some sort of get you out of your room activity, at least one a day. That would be nice. It gets kind of isolating.” P8 “Just take the time and let a person with mental illness talk. Listen to them. Don't just jump down and throw them a bunch of medicine and stuff. Give them a chance to explain how they feel. That makes a big difference.” P14 "Pay attention to the patient. If you care, stay in the field, you have to care. And don't be a doctor or nurse that don't care, because if you don't care, you might as well be sweeping the streets, because they're going to treat you that way.” P19

Managing through Hard Times	Participants spoke about time in the hospital as difficult. They were <i>medically complex with many symptoms (ST)</i> and had <i>intense emotional experiences (ST)</i> for which they had to call on a variety of <i>strategies of self-management (ST)</i> .	“You got some people that have more serious mental health problems and actually laying in the bed like this can aggravate them. Just having to lay in the bed and be still that’s a pressure for people that can’t stay still or patience, it’s a big thing, and timing and people coming to them to take care of them. A lot of mental patients can’t handle it. They can get belligerent or get wild or crazy.” P14
<i>Medically Complex, Many Symptoms</i>	Participants discussed both hospitalization medical conditions and comorbidities , as well as the varied physical symptoms that persisted during their stay in the hospital.	“I could barely talk, I couldn’t drink anything...The transition that day was the hardest day and then the next day was slightly-it wasn’t as hard but it was hard.” P8 “But I come in, they say, pneumonia, both lungs, didn't they? I said, ‘Damn, I feel nothing.’ They said, emphysema. I said, ‘Damn, I don't inhale, but I've been smoking since I was 13.’ So I'm like, ‘Damn, I'm really not paying attention pay attention to me and my health. I could die.’ They tell me diabetes. I mean, how the fuck did I get diabetes? But I’m glad all these things been picked up now. P19 “They did surgery on me. And they put in a tube...so I could eat. Because I haven’t eaten in over a month.” P20

<i>Intense Emotions</i>	Participants spoke about hospitalization as emotionally intense, describing high levels of fear and anxiety , as well as frustration , anger and shame .	“It's been alright, because like I said I don't want to have hallucinations again, they were very scary and unlike me. I'm pretty much a gentle soul. But, I don't like that, and I don't want anybody to see like that either.” P3 “Because I’m scared to death. The only think I kept thinking about something’s going to go wrong, something’s going to go wrong. And they were like... ain’t nothing going to go wrong, every thing’s going to be fine.” P15 “That would be the best thing in the world for them because fear comes in when you go to a surgical floor, "What are they going to do to me now?" You forget that you're not here for your mental inability, but you're here for a physical problem, and it's spooky when you come up here.” P12 "I snapped at a couple of them because of the pain, but I apologized when the pain subsided." P19
<i>Strategies of Self-Management</i>	In the hospital, participants felt they had to work to manage their actions and emotions, to stay calm . To accomplish this, they relied on family , spirituality , nurse interventions and psychiatric medications .	"I try to be nice to them. I don’t try to go overboard on my, this, this, well, this rup-rup-this upset life. I try not to bring that out too much. Even that is overbearing for me, saying something like that." P7 “That’s how it works. If I didn’t have him, my niece or my brother, somebody in my family always try to be there because it makes it easier, because I wasn’t always easy... I like the way it is, it works out better for me.” P9 “Yes, because when I take [Psych Meds], I'm a lot calmer, I hear clearer—like I can understand what someone's saying to me. But when I don't have my psychotropic medication, I'm a real bitch, because I don't know how to be calm” P12

Note. **Bold** indicates codes used to construct theme or participant ID numbers; *italics* indicates sub-themes

CHAPTER 4
NON:PSYCHIATRIC HOSPITALIZATION LENGTH-OF-STAY FOR PATIENTS WITH
PSYCHOTIC DISORDERS: A MIXED METHODS STUDY

Abstract

Background: Patients with psychotic disorders experience a high rate of many chronic and acute diseases compared to the general population. This disparity leads to frequent non-psychiatric hospitalizations. A review of relevant literature indicates that these patients have a longer length-of-stay and more variability in length-of-stay than other patients.

Methods: This article reports the results of a mixed methods, exploratory sequential study on non-psychiatric hospitalizations of individuals with psychotic disorders. In Phase 1, we qualitatively explored the experiences of patients with psychotic disorders on medical-surgical units and, in Phase 2, used their experiences to guide variable selection for a quantitative analysis of factors related to length-of-stay. The results of Phase 1 and Phase 2 were then integrated.

Results: Phase 1: Participants described their experiences in the hospital and provided information used for quantitative variable selection. Phase 2: Medical comorbidities were the patient characteristics with the largest effect on length-of-stay. Certain processes of care highlighted by patients from Phase 1 were also associated with longer length-of-stay, including: physical restraints (105% longer), psychiatric consult (34%) and continuous observation (133%). Only outpatient appointments in the six months prior to hospitalization were associated with shorter length-of-stay. Data integration highlighted that factors which were important to patients (e.g., partner support), were not always significant in the model, while others such as medical comorbidities and use of physical restraints were found to be important in both the qualitative and quantitative inquiry.

Discussion: These findings indicate that certain patient characteristics and processes are associated with longer length-of-stay during non-psychiatric hospitalizations. Those who

are experiencing acute psychotic symptoms are an important group to consider, as those processes associated with longer length-of-stay are often used to manage symptoms of acute psychosis and agitation in the hospital settings. Further research is necessary to create reliable risk profiles for which patients with psychotic disorders are at highest risk for extended length-of-stay.

Introduction

While approximately 6.6% of Americans are hospitalized in a single year, inpatient hospitalizations account for roughly a third of the total medical costs in the United States (Stagnitti, 2016). Current estimates for direct hospitalization costs in the United States are \$3.75 billion per year, with over 30% of those costs being covered by public insurance and individuals (Weiss & Elixhauser, 2006). Poor hospital outcomes contribute greatly to the high costs of hospitalization and the economic impact on individuals and the healthcare system (Dormann et al., 2004; Spyropoulos & Lin, 2007). Moreover, poor hospital outcomes like extended length-of-stay (LoS), adverse events and readmission are not evenly distributed; certain groups are more likely to experience them and bear the burden of their sequelae. Marginalized and underserved groups are at especially increased risk of poor hospital outcomes (Carthon et al., 2012; Joynt et al., 2011; Tsai et al., 2013). A better understanding of the populations at highest risk and what factors are associated with their poor outcomes is vital to addressing these disparities effectively.

There are more than 22 million people in the United States with a psychotic disorder (Kessler et al., 2005; McGrath et al., 2008; Messias et al., 2007), a group of psychiatric diagnoses primarily characterized by hallucinations, delusions and/or thought distortions (APA, 2013). These individuals experience persistent disparities in health and health outcomes, with high rates of acute and chronic medical conditions relative to the general population (Bresee et al., 2010; Bushe & Holt, 2004; Chen et al., 2012; Kilbourne, Brar, Drayer, Xu, & Post, 2007). These medical conditions, as well as other factors, contribute to an estimated life expectancy 20 years shorter than cohort peers,

even when accounting for substance abuse and suicide (Bitter et al., 2017; Laursen et al., 2014).

The high medical burden experienced by this population is an important factor in their increased risk of non-psychiatric hospitalizations compared to the general population (Cahoon et al., 2013; Davydow et al., 2016). When in the hospital, these patients are at an increased risk of poor hospital outcomes, including more adverse events (Khaykin et al., 2010; Liao et al., 2013), increased risk of readmissions to the hospital (Chwastiak et al., 2014; Davydow et al., 2016; Puntis, Rugkasa, & Burns, 2016) and a longer stay in the hospital compared to other patients (Bressi et al., 2006; Chen et al., 2011). Thus, understanding hospitalizations is important to reducing health disparities of this vulnerable population.

Though length of hospitalization depends on many complex factors, length-of-stay (LoS) is important to understanding hospital care and outcomes. Meaningful and life-saving care is delivered during hospitalization but longer LoS creates problems, both for patients and the healthcare system. When a patient stays in the hospital longer than necessary, space that could be used for others is occupied, the economic burden on the individual and the system grows, and the possibility of poor outcomes rapidly increases. Hospitalization exposes patients to dangers like medication errors and adverse events (Hauck & Zhao, 2011). Thus, LoS as an outcome measurement speaks to both hospital efficiency and patient safety (AHRQ, 2009). Indeed, LoS extended beyond that needed for a procedure or disease is thought to be “reflecting either inefficiency of care or the development of complications that may slow the rate of discharge” (Silber, et al., 2003, pg. 1191).

A careful balance thus is needed with LoS, to ensure proper recovery while reducing risk of adverse events and additional costs. While many procedures can now be conducted outpatient, many medical conditions require extended periods of treatment or intensive preparation for home disease management. Too short of LoS makes patients vulnerable to readmission as treatment, health education and preparation for self-care may be incomplete (Bardhan, Oh, Zheng, & Kirksey, 2014). Overall though, the balance in the United States tilts towards shorter periods of hospitalization both to decrease the burden on the healthcare system (Carey, 2015) and decrease patients' susceptibility to adverse events and other problems related to inpatient hospital stays (Hauck & Zhao, 2011). For patients with psychotic disorders, length-of-stay is critical understanding their hospitalizations and improving health and hospital outcomes.

Review of the Literature

Literature on psychiatric hospitalization LoS for patients with psychotic disorders is robust (Ismail, Selim, & El-Khashab, 2017; Masters, Baldessarini, Öngür, & Centorrino, 2014; Newman, Harris, Evans, & Beck, 2018) and finds clear relationships between LoS, patient characteristics and hospital processes. However, non-psychiatric hospitalizations and the factors related to LoS for patients with psychotic disorders has been understudied. To the authors' knowledge, there are no other studies focused primarily LoS on this population in this setting.

A previous systematic review on adverse events for patients with psychotic disorders hospitalized in non-psychiatric settings (Weissinger, Brooks Carthon, & Brawner, in preparation-a) was used to identify information on LoS for these patients. Overall, patients with psychotic disorders had statistically and clinically significantly longer LoS than other patients across all reviewed studies that did not use LoS as a

matching variable (See Table 4.1). Compared to patients with no psychiatric diagnoses, median LoS was 0.8 to 2 days longer (Daumit et al., 2006; Khaykin et al., 2010) and mean LoS was 0.6 to 15.4 days longer (Buller et al., 2015; Liao et al., 2013; Smith et al., 2012). As each day in the hospital has economic and safety repercussions for the individual and the hospital, even the smaller differences in these samples indicate that this population is at risk for longer LoS and other poor outcomes.

In addition to longer LoS, patients with psychotic disorders also higher variance in their LoS than patients without psychiatric diagnoses (See Table 4.1). Reviewed studies found 0.4 to 22.1 higher standard deviations (SD) in LoS and interquartile ranges of 1.5-3 days longer for these patients than for comparison groups. Despite being conducted in various health systems and hospitals, variance was higher in all studies for patients with psychotic disorders. The relationship between patient characteristics, processes or system factors and LoS were not examined in these studies, therefore the cause of this extended LoS and what factors may drive this disparity remain unknown.

To better understand differences in LoS during non-psychiatric hospitalizations for patients with psychotic disorders and generate information for creating risk profiles and developing interventions, a patient-centered approach was used to study patients' hospital experiences and LoS during non-psychiatric hospitalizations. This paper reports the results of Phase 2 of this mixed method, exploratory sequential study which used patient interviews to inform data selection around patient characteristics and hospital care processes of patients with psychotic disorders experiencing non-psychiatric hospitalizations.

Methods

This study was approved by the Institutional Review Board of the University of Pennsylvania. It is an exploratory sequential mixed methods study with the objective of increasing the understanding of non-psychiatric hospitalizations of patients with psychotic disorders. It consists of two phases: (1) qualitative interviews with patients with psychotic disorders hospitalized on medical-surgical units; and (2) a quantitative analysis of non-psychiatric hospital LoS, with variable selection driven by results of Phase 1. The results of the two phases were also integrated to more comprehensively describe non-psychiatric hospitalization for patients with psychotic disorders with both statistical models and patient experiences.

Design & Approach Rationale

Mixed methods research is a distinct methodology, valued for approaching complex problems, especially around health disparities (Creswell & Plano Clark, 2018). Exploratory sequential mixed methods design begins with qualitative data collection to investigate a specific phenomenon then transitions to quantitative analyses, informed by the results of the qualitative inquiry (Creswell & Plano Clark, 2018). This design is particularly appropriate when information on a subject is sparse, as qualitative data collection can be used to explore the situation and the quantitative phase can be used to quantify factors or analyze statistical relationships. The Quality Health Outcomes Model (QHOM; Mitchell, Ferketich, & Jennings, 1998) was used as a framework for this research, guiding qualitative coding and structuring quantitative analysis interpretation. See Figure 4.1 for a visual representation of the QHOM. See Figure 4.2 for the mixed methods study diagram.

Full details for Phase 1 have been previously published (Weissinger, Brooks Carthon, Ahmed & Brawner, in preparation). Briefly, qualitative interviews were

conducted and analyzed with an inductive-deductive thematic analysis approach (Braun et al., 2014a; Vaismoradi et al., 2016). Inductive coding creates categories of meaning and patterns through close, repeated readings of transcripts and notes (Saldaña, 2015). Deductive coding employs a model or framework, here the QHOM, to identify trends and patterns (Rivas, 2012). Both inductive and deductive codes generated from Phase 1 were used to guide quantitative variable selection and interpretation in Phase 2.

For Phase 2, a retrospective observational study of length-of-stay of patients with psychotic disorders during non-psychiatric hospitalizations was conducted. Data from the quantitative interviews was matched with available data from the clinical data warehouse operated by the healthcare system in which the qualitative study took place. This data warehouse integrates clinical, administrative and billing data from the entirety of the healthcare system. More robust than simple EHR data, it was created to facilitate quality improvement projects and clinical research and contains more than a billion points of data on a wide variety of clinical, demographic and hospital care processes. Similar clinical data warehouses have been used in a wide variety of research, including nursing research (Okada, Aoki, Fukawa, Matsuoka, & Tsuchihashi-Makaya, 2016), clinical pharmacy (Mills, Talati, Alby, & Han, 2016) and treatment pathway evaluation (Umscheid et al., 2015).

Phase 1

Qualitative Procedures

To better understand the experiences of non-psychiatric hospitalization for patients with psychotic disorders, qualitative interviews were conducted with hospitalized patients. All participants were recruited from medical-surgical units of an academic medical center in Philadelphia, Pennsylvania. The lead author conducted interviews with

20 individuals who were: (1) hospitalized on a non-intensive care unit (ICU) medical-surgical unit, (2) aged 18 and older, (3) diagnosed with a psychotic disorder, (4) able to speak fluently in English, and (5) on the unit for a minimum of 24 hours. Potential participants were excluded if they had a (1) significant cognitive delay or dementia or (2) scored below a 14 on the UCSD Brief Assessment of Capacity to Consent (UBACC; Jeste et al., 2007).

Phase 2

Quantitative Procedures

All quantitative data were drawn from the clinical data warehouse of a large, multi-hospital health system centered in Philadelphia, Pennsylvania. The health system includes both urban and suburban hospitals, inpatient and outpatient care providers and a variety of specialist services. For this analysis, data was drawn on hospitalizations at three urban hospitals in the health system, one of which was the site for Phase 1.

Inpatient hospitalization and outpatient appointment data, which did not include provider notes, was obtained for patients who: (1) were admitted to any of the three hospitals from 2012 to 2017, (2) age 18 or older, (3) had a diagnosis of a psychotic disorder during index hospitalization (See Table 4.3 for a complete listing of psychotic disorders, brief descriptions and relevant ICD-9 and ICD-10 codes), (4) had an LoS of 1 day or more, and (5) were not admitted to a psychiatric or substance abuse unit or by a psychiatric service.

Outcome Measures

Length-of-stay was the primary outcome for this study. LoS measures time from admission to the hospital to discharge. Those who stayed less than 24 hours and those who died during their hospital stay. As noted by Thomas, Lucke, Wueste, Weavind, and Patel (2009), patients who die before discharge are medically different than other patients

and their data may also interfere with certain statistical analysis (i.e. some data is not technically missing, just nonexistent due to patient death). Therefore, only data for hospitalizations where the patient survived the hospitalization were used.

Independent Variables

The initial list of independent variables was drawn primarily from the deductive coding of qualitative interviews, organized around the QHOM. Additional variables were also drawn from the inductive codes, clinical expertise, and reviews of the literature. As an example of variable selection, multiple participants in the qualitative interviews spoke about the importance of their partner during hospitalization, as they helped with physical task and provided emotional support. Conversely, some participants without partners spoke about loneliness and feelings of isolation. These details were coded as a patient characteristic and matched to the marriage and partner status variable from the clinical data warehouse. In another example, participants wanted to speak to someone knowledgeable about mental illness, as they had difficulty discussing and managing their psychiatric symptoms with non-psychiatric providers. In setting notes, nurses on the units spoke to the interviewer about the rarity of completed psychiatric consults. These were coded as care processes and used to identify variables around orders for social work and psychiatry consult. See Table 4.2 variable chosen for the initial quantitative model building.

Medical comorbidities were a common patient characteristic discussed by participants in Phase 1. Rather than creating individual independent variables for all mentioned comorbidities, this study uses the Elixhauser Comorbidity Index (ECI) which was designed for health services research that uses administrative and billing data (Elixhauser, Steiner, Harris, & Coffey, 1998). The updated form of this measure uses 28

different major medical conditions associated with poor hospital outcomes (Potts et al., 2019; Quan et al., 2005). The measures for the comorbidities of depression, drug abuse and alcohol abuse were not included. General psychiatric comorbidity and substance use comorbidity were highlighted in Phase 1 interviews and so were separate variables. Psychosis was not included as all participants had diagnosis of a psychotic disorder.

Data Cleaning, Validation and Analysis

After approval from the Institutional Review Board (IRB) of the University of Pennsylvania, a data request was submitted to the clinical data warehouse. All data management and statistical analyses were conducted using the Statistical Analysis System (SAS; SAS Institute Inc., 2013). Data cleaning, validation and transformation were supervised by Dr. Alex Hanlon and Jesse Chittams of the University of Pennsylvania School of Nursing Biostatistics, Evaluation, Collaboration, Consultation and Analysis (BECCA) Lab in full consultation with the lead author. BECCA Lab was responsible for evaluating data for out-of-range, duplicate, and missing values; performing consistency checks; coding composite variables; managing databases generated from data collection; and statistical consultation.

All variables used in statistical analyses were analyzed for appropriateness to the relevant statistical methods before analyses began. To avoid problems of multiple hospitalizations for an individual within the same sample, only the first hospitalization that met inclusion criteria during the period, the index hospitalization, was used for analyses. As expected from the literature around LoS during non-psychiatric hospitalizations (Carter & Potts, 2014; Lee, Gracey, Wang, & Yau, 2005), sample patients' LoS were highly positively skewed. A log transformation approach is often used when modeling LoS as this skew violates the assumptions of many statistical analyses

(Carey, 2015; Faddy, Graves, & Pettitt, 2009; Moran & Solomon, 2012; Tschannen & Kalisch, 2009). A natural log transformation was used which led to a large reduction of the skewness, from 11.16 to 0.55, and creating a more normal distribution. See Figure 4.3 for a graphic comparison of LoS and the transformed variable.

Univariate models were used to determine variable suitability for inclusion in model building, those significant at $p \leq .20$ were initially included. Average intraclass correlation between all potential independent variables was low (ICC=-.003 for all, ICC=-0.030 excluding comorbidity measures). Fisher's exact test was used to detect collinearity amongst independent variables. If variables were found to covary at the $p < 0.05$ level, the variable's presence and absence from the model was used to identify changes in significance or effect size of the other variables (Kim, 2017). Three independent variables (psychiatric consult, physical restraints, and ICU care) were found to covary but their presence and absence did not influence the significance or effect size of other variables in the model so all were included.

Major Diagnostic Categories (MDC) organize hospital discharge diagnoses into categories based on both physiological symptom and severity of illness. Individual hospitalization MDC is associated with LoS, hospital resource usage and readmission (Kuwabara et al., 2008). Because this analysis looked at individuals admitted for all non-psychiatric hospitalizations, MDC categories were used as a categorical control variable. Categories that were both less common and had a low effect on LoS were collapsed into a single category (e.g. Eye; Ear, Nose, Throat; Skin, Subcutaneous Tissue, Breast) of MDC-Other. Uncommon MDCs that had a large effect on LoS (e.g. Multiple Significant Trauma, Pre-MDC) were kept as separate categories.

Initially, a hierarchical linear model was conducted to account for clustering of patients, with levels at the admission unit and hospital. The intraclass correlation (ICC) for hospital was low (ICC=0.0153) and the exchangeable working correlation for the model was low (WC=0.0111), which indicates that the hierarchical approach is not an appropriate model (Bliese, 2000). A general linear model was then constructed, using the log-transformed LoS variable as the outcome. Backwards elimination was then used until all remaining variables were significant, excluding variables associated with hypotheses. The final model contained 26 independent variables and two control variables, MDC and medical or surgical hospitalization. After model creation, β -coefficients were used to create percent effects on length-of-stay (IDRA, 2019). The final model was tested for goodness-of-fit using an adjusted r^2 analysis (Nakagawa & Schielzeth, 2013).

Based on the qualitative interviews, clinical expertise, and reviews of related literature, we hypothesized that: (1) discharge to a psychiatric setting would be associated with LoS; (2) use of intramuscular chemical sedation or physical restraints would be associated with LoS; and (3) diagnosis of schizophrenia would be associated with LoS. All hypotheses were set at the $p < 0.05$ level.

Power Analysis

To determine the level of sensitivity of the developed model, a power analysis was conducted using G-Power (Faul, Erdfelder, Lang, & Buchner, 2007). For the general linear model approach, a two-tailed $\alpha = 0.05$, $\beta = 0.95$, a sample size of 3900 and with 44 independent predictive variables yields a detectable effect size (f^2) of 0.0106. No significant variables had an effect size smaller than 0.0106.

Integration

Integration, one of the fundamentals of mixed methods research (Fetters et al., 2013), is accomplished in multiple ways in this study. First, the sequential exploratory study design means that qualitative research informs the quantitative research (Creswell & Plano Clark, 2018). In this study, Phase 1 qualitative interviews guided variable selection for the Phase 2 quantitative analysis. Use of qualitative data to inform variable selection for quantitative analyses has been used in other health outcomes research (Dyson et al., 2017) and is an exemplar of mixed methods integration (Happ, Dabbs, Tate, Hricik, & Erlen, 2006). Initially, it was hoped that the themes from the thematic analysis of Phase 1 would guide variable selection, but themes were not able to be matched with available quantitative variables. Nevertheless, codes, especially the deductive codes based on the QHOM, did provide variables that were quantified in the clinical data warehouse, primarily patient characteristics and processes (See Figure 4.4 and Table 4.2). This approach centered patient experiences of hospitalization as critical to understanding and addressing disparities while operating within the limitations of available data sources.

The second point of integration was through data reporting, conducted in a weaving and contiguous approach. First, there is a contiguous reporting of qualitative and quantitative results, with the results of Phase 1's thematic analysis reported in Weissinger, Brooks Carthon, Ahmed, et al. (in preparation) and the results of Phase 2's quantitative analyses presented below. This approach allows for the qualitative information to be presented as important and not overshadowed by outcomes-focused quantitative data (Creswell & Plano Clark, 2018). In this paper, after the quantitative data is presented, there is a weaving approach which brings together both quantitative and

qualitative results to create a fuller understanding of these patients' hospitalization. For a study that uses primarily EHR and billing data, weaving contextualizes and humanizes the quantitative data, which is an aggregation of information about thousands of individuals, by demonstrating that each data point represents an individual with their own experiences, thoughts and feelings (Fetters et al., 2013).

Results

Phase 1

More in-depth discussion of participants in the qualitative phase of this study can be found in Weissinger, Brooks Carthon, Ahmed, et al. (in preparation). Briefly, interviewed participants were predominantly Black or African-American (60%), living in a stable housing situation (95%), unmarried and on disability related to their mental health and/or medical conditions (70%). Almost half of the participants had more than one psychotic disorder documented in the EHR, with eleven having a diagnosis of schizophrenia and eleven having a diagnosis of bipolar disorder with psychotic features. Participants had been in the hospital for an average of 7 days (SD = 8.7; range 1-30). Their reason for hospitalizations varied and included: cardiovascular problems, drug overdose, diabetes, pulmonary symptoms, orthopedics, gastrointestinal surgery, infection, pain. Twelve of the patients were on general medical-surgical units, and the rest were on specialty units: surgery, orthopedics/trauma, and cardiac.

The thematic analysis identified five themes, two of which were composed of multiple sub-themes: 1) *managing through hard times*, 2) *ignored and treated unfairly*, 3) *actively involved in health*, 4) *appreciation of caring providers* and 5) *violence: expected and experienced*. Of these *managing through hard times* included three sub-themes: *intense emotions*, *medically complex with many symptoms* and *strategies for self-*

management. Actively involved in health consisted of the sub-themes of *seeking health education* and *suggesting changes*. Overall, participants described difficult experiences in the hospital managing their psychiatric and physical illnesses. They wanted to be highly involved in their own health but felt unable to do so, due to their psychological symptoms and difficulties engaging with providers and the healthcare system. As seen in Figure 4.4, the deductive coding based on the QHOM generated substantial coding around patient characteristics and process factors, with less available material on systems or outcomes.

Phase 2

Descriptive Statistics

A total of 3,900 patients that met inclusion criteria were identified for this analysis. Demographic details of the sample can be found in Table 4.4. Overall, 66.1% of the patients identified as Black, 29.1% as White, and 3.2% identified as Hispanic or Latino. The sample was a majority female (53.1%) and 13.9% were married or partnered. Almost all (88.1%) used some form of public insurance as their source of payment, only 4% had commercial insurance. The average age was 52.9 (SD=14.9). Almost all participants (92.3%) had at least one Elixhauser comorbidity, and 29.6% had four or more.

Table 4.5 describes the psychiatric diagnoses of the sample. Schizophrenia was the most common psychotic disorder diagnosis (52.8%), but a substantial number of the participants had a mood disorder with psychotic features (36.2% MDD with psychotic features, 28.3% bipolar disorder with psychotic features). Over half (60.3%) had only one psychotic disorder in their discharge diagnoses, but 30.7% had two and 9% had 3 or more. For non-psychotic psychiatric diagnoses, tobacco use disorders, depressive disorders and bipolar disorders were the most common (28.9%, 23.4% and 21.6%

respectively; see Table 4.5 for further breakdown). Overall, 51.7% of the participants had a comorbid, non-psychotic psychiatric condition and 42.1% had a substance use disorder diagnosis.

Hospitalization characteristics, including patient demographics, processes of care and discharge disposition, can be found in Table 4.4. The average LoS in the sample was 6.9 days (SD=11.3), with a minimum of 1 day and a maximum of 289. Most hospitalizations were emergencies (67.4%), though almost a fourth were for elective, planned procedures (22.7%). The largest single major diagnostic category (MDC) was Circulatory (12.95%), followed by Musculoskeletal (11.49%) and Nervous System (10.03%). Despite not being admitted to a psychiatric unit or by a psychiatric service, 157 (4.03%) of the hospitalized patients had an MDC in the mental disorders and diagnoses category. See Figure 4.5 for more information about patient MDCs.

In the care processes assessed, care by a hospitalist and ICU care were the most common (11.1% and 5.3%, respectively). Only 3.6% of the patients had a documented consult with psychiatry and 1.2% consult with social work or case management. Continuous observation, physical restraints and IM sedative or antipsychotic use were also uncommon (0.9%, 3.4% and 0.7%, respectively). Post-discharge, most patients were discharged to home (39.8% routine discharge to home, 25.7% discharge with home health), but 11.7% were discharged to psychiatric facilities and 13.9% were discharged to rehabilitation settings or skilled nursing facilities.

Quantitative Modeling

See Tables 4.6 and 4.7 for the quantitative model. Table 4.6 contains patient characteristics and 4.7 contains process and system factors. LoS was associated with patient characteristics, processes and system factors. The adjusted r^2 was 0.34. All

demographic variables were removed from the model during backwards elimination. In the final model, controlling for MDCs and medical vs. surgical admission, fifteen Elixhauser comorbidities were associated with longer LoS. Weight loss had the largest effect on LoS, with an increase of 92%, but HIV/AIDS, deficiency anemia, coagulopathy, diabetes with complications, fluid and electrolyte disorders, pulmonary circulation disorder and solid tumors were also all associated with an increase in LoS of 20% or more. Diagnosis of schizophrenia did not have a significant effect on LoS, contrary to hypotheses.

Hospital processes were also found to have an important impact on LoS. An order for continuous observation had the largest association with LoS, with a 133% increased LoS, but use of physical restraints (64%) and IM sedative or antipsychotic use (41%) also had statistically and clinically significant relationships with LoS. Of all processes, only outpatient appointment in the six months prior to admission was related to shorter length of stay (-9.9%). Another hypothesis, discharge to a psychiatric facility was found to not be significantly related to LoS. Though system factors were not a focus, admitting hospital was significantly related to LoS, with one hospital having 19% longer LoS than the reference hospital. Admission unit type was also significantly related to LoS, with ICU admission being 45% longer and surgical-only units being 15% shorter than medical-surgical units.

Integration

There are important convergences and divergences between the quantitative and qualitative data that was collected. Participants in Phase 1 spoke of the importance of appropriate psychiatric care during hospitalization. They felt that their psychiatric medications were critical for managing themselves and to make the hospitalization

smoother for them and for their providers. After receiving her medications which had been discontinued upon admission, one participant stated, “I’m having my issues but not as much as I would without my medication” (P2). Patients believed their medications were vital for self-management, as one participant noted “I don’t want to have hallucinations again, they were very scary and unlike me. I’m pretty much a gentle soul, but I don’t like that, and I don’t want anybody to see me like that either” (P3). Despite all patients having a diagnosis of a psychotic disorder, 51.7% having a non-psychotic comorbid mental illness and 42.1% having a substance use disorder, only 3.6% of participants had a psychiatry consult. Additional sources of support for support, like social workers and pharmacists helping with medication management were also uncommon (1.3% and 1.1% of sampled patients). As one participant stated, “It’s been a hard time for me...I just want somebody to talk to” (P14) but for these patients, there is often no one to talk to who has an expertise in psychiatry or mental health.

Many medical comorbidities were significantly related to LoS and the phenomena of multiple medical comorbidities was also highlighted by participants in the qualitative interviews. One participant spoke about how she was told she has: “‘Pneumonia, both lungs’ and I said ‘Damn, I feel feel nothing. They said ‘emphysema’...I’m really not paying attention to my health. They tell me diabetes. I mean, ‘how the fuck did I get diabetes?’” (P19). The increased LoS associated with comorbidities may indicate, as discussed by participants, that care is prioritized to acute conditions and that assessment and treatment of other conditions occurs after stabilization. One participant spoke about how his chest pain was treated promptly but treatment for a large cyst was delayed until later, so he felt initially that “they seemed to be ignoring the thing on my head” (P11).

Alternatively, comorbidities may complicate the process of treatment and recovery, as one participant who was told to walk during her hospital stay explained: “I broke my ankle in March and it’s still not getting better. I mean, I can put weight on it...but I have a boot that I have to wear I have a bone stimulator. But I feel like they don’t take it as serious” (P4). Patients feel that their medical conditions should be recognized and addressed together, even as providers may focus on specific issues or prioritize assessment and treatment.

An interesting divergence between the data from Phase 1 and Phase 2 was the topic of IM sedation and physical restraints. Participants in Phase 1 disclosed experiences and fears related to these interventions, which often colored their interactions with hospital staff and the healthcare system overall. One participant talked about how he felt staff had “Drug me up and tie me to the bed. Left me there. Now I’m ready to go home.” (P5). Despite it being a common topic of conversation, these interventions were rare, with only 3.4% of the sample experiencing physical restraint and 0.7% IM sedation or antipsychotics. While they had a significant effect on LoS, only a small percentage of patients experienced them during the hospital stay. Thus, they have an outsized effect on patients with psychotic disorders experiences of hospitalization, some of whom attribute this association with their previous experiences of psychiatric hospitalizations that simply carries over to the non-psychiatric setting.

Both the quantitative model and patient experiences of hospitalization identified that outpatient care and the hospital were important to hospital outcomes. Over half of the participants had an outpatient appointment in the last six months within the same health system and this was associated with significantly shorter LoS. In the qualitative

interviews, participants described going to a hospital because of previous connections with outpatient care. One participant explained, “I like [this healthcare system] a lot better than I like [other local] systems. Because they take good care of you here” (P13). An outpatient provider had come to see him while he was in the hospital and helped him to make a post-discharge appointment. Another participant (P12) who received her care in a different health system complained that, though she had given her providers’ phone numbers to the physicians, there was little communication and she felt she was not getting the right medications. This previous connection offered the patient’s both psychological comfort and was associated with better outcomes.

Discussion

This study was the first to the authors’ knowledge that examined individuals with psychotic disorders and what factors related to LoS within this group. It is also one of the first studies that connected patient experiences in the hospital to outcomes, especially for a marginalized population like patients with psychotic disorders. Overall, this study found significant relationships between select patient characteristics and care processes with non-psychiatric hospitalization LoS that bear further consideration and research.

Only one of the hypotheses for this study was supported in the final model. A diagnosis of schizophrenia, as opposed to any other psychotic disorder, was not found to be associated with LoS, despite its association with impaired cognition and functional status compared to other psychotic disorders (Bowie et al., 2010; Evans et al., 2003; Friedman et al., 2001). Other literature has found an increased length-of-stay for patients with schizophrenia during non-psychiatric hospitalization only compared them to the general population of patients. These results indicate that for LoS, their outcomes are comparable to other patients with psychotic disorders.

Despite both patients and nurses discussing how a discharge to a psychiatric facility was delaying discharge from the hospital, discharge to a psychiatric facility was also not significantly related to LoS. These patients may be perceived to be having longer length-of-stay because they are medically stable enough to be discharged to a psychiatric facility but awaiting placement. Other patients with a psychotic disorder who are not discharged to a psychiatric facility would receive treatment the entire length-of-stay and thus not feel as if they are at the hospital for an extended period. Further research is necessary to determine if there are diagnostic sub-categories among individuals with psychotic disorders that are associated with longer length-of-stay and other hospital outcomes.

Only orders for physical restraints and IM sedation or antipsychotic use were associated with LoS from the hypotheses, and both were related to a longer Los. There are a variety of reasons that individuals who experience these interventions may have longer length-of-stay. They may have simultaneous medical need for non-psychiatric hospitalization and an acute exacerbation of psychotic symptoms. While no symptom measures were available, acute psychosis has been associated with longer LoS (Hong et al., 2013) as well as increased use of IM sedation and physical restraints(Simpson, Joesch, West, & Pasic, 2014), indicating a possible explanatory relationship. As acute psychosis, physical restraints and IM sedation are associated with longer LoS in literature on non-psychiatric hospitalizations (Stewart, Bowers, Simpson, Ryan, & Tziggili, 2009; Zhang, Harvey, & Andrew, 2011), it is possible that these factors act as indicators of patients with higher psychiatric symptoms. Other literature has shown that individuals who experience the use of IM sedation or physical restraints are more likely to experience

adverse events (D'Amour, Dubois, Tchouaket, Clarke, & Blais, 2014), and may be a partial explanation of the longer LoS associated with these processes. Further research is necessary to understand which, if any, of these factors is the causal mechanism in the relationship between these care processes and LoS.

As individuals with psychotic disorders have higher prevalence of many medical conditions than the general population (Batki et al., 2009; Bresee et al., 2010; Filik et al., 2006; McPherson et al., 2014; Ohayon, 2014; Reilly et al., 2015), the high rates of comorbidities found in this sample were not surprisingly. Only 8.7% of the sample had no Elixhauser comorbidities, and 29.6% had four or more. Surprisingly, despite the high prevalence of diabetes in this population (Bushe & Holt, 2004; Grover et al., 2014; Krane-Gartiser et al., 2011), only 13.3% of the sample had a diagnosis of diabetes, only slightly more than the national prevalence of diabetes (Centers for Disease Control and Prevention, 2017). Similarly, the prevalence of obesity was actually lower than in the general population (Hales, Carroll, Fryar, & Ogden, 2017), despite being higher in the overall population of people with psychotic disorders (Correll et al., 2015; Correll et al., 2014; Gordon, Xavier, & Louza, 2013; Morgan et al., 2014). The patients coming to this hospital system may have had fewer of these comorbidities or they did not reach the level of requiring care during the hospital stay and thus were not recorded.

The previously discovered relationship between medical comorbidities and LoS was firmly supported by this study (Pugely, Martin, Gao, Belatti, & Callaghan, 2014; Wang, Stavem, Dahl, Humerfelt, & Haugen, 2014). When using standardized measures of comorbidity to examine LoS in non-psychiatric hospitalizations, both overall number of comorbidities and specific comorbidities are associated with longer LoS (Ofori-Asenso

et al., 2018; Potretzke et al., 2016; Potts et al., 2019; Thombs, Singh, Halonen, Diallo, & Milner, 2007). Though a composite measure was not used, as it is not recommended for use with the Elixhauser Comorbidity Index (Elixhauser et al., 1998), more than half of the measured comorbidities were associated with extended LoS. Fifteen Elixhauser comorbidities in the sample were associated with longer LoS and eight were associated with an increase of more than 20%. Weight loss and coagulopathy had the largest effect on LoS (73% and 35%) in the model but were never discussed by participants in Phase 1, who primarily spoke about diabetes, chronic pulmonary conditions and injuries. The loss of functional status and high symptom burden of these conditions may have made them more salient to the patients, though they have a smaller effect on LoS.

Finally, the lower adjusted r^2 for the model ($r^2=0.34$) indicates that only some of the variability found in LoS for patients with psychotic disorders is explained by this model. LoS is a highly variable hospital outcome (Faddy et al., 2009) so even this level of explanatory power is important. The low prevalence of the process variables may have contributed to the lower predictive power of the model, but LoS is also affected by factors difficult to integrate into statistical models, such as weekday of admission or the availability of beds in post-discharge institutions. This model then serves as an important contribution to the literature as it can be used to identify individuals who may be at risk for very long LoS and better understand how to move them efficiently through the hospital.

There are limitations to this study that must be acknowledged. First, this study was cross-sectional in nature, which limits the ability to make causative inferences. As the purpose was to understand how various factors relate to LoS, regardless of causative

relationships, the results still have utility even if they do not identify modifiable factors in the hospital stay. A profile of both patient characteristics and processes associated with extended LoS can be developed and used to identify those in need of greater support. Additionally, this study relied on data from an EHR, which is intended for clinical and billing purposes, though with adaptations to facilitate research and quality improvement (Coorevits et al., 2013). Thus, this data may be different than that collected in primary research, as it focuses on clinical usability rather than the reliability and validity (Wei & Denny, 2015). Finally, the entire sample was drawn from three large teaching hospitals, all part of a single academic institution. While many of the patients are from the local area, especially as one of the hospitals act as a safety-net hospital to the local community (Safety Net Association of Pennsylvania, 2015), the patient and provider mix present in these institutions may differ from other hospitals. Despite this limitation, using three teaching hospitals in the same urban area reduced system-level variation and allows for more careful consideration of patient characteristics and processes.

Despite limitations, important conclusions can be drawn from this research. Overall, there is a significant relationship between patient characteristics, hospital processes and LoS for patients with psychotic disorders. Patients with specific medical comorbidities and those that require certain processes like continuous observation, physical restraints and psychiatric consults generally have longer LoS. The high rate of comorbidities in this population and the low prevalence, but high effect on LoS, of many of these processes may account for the longer overall length-of-stay experienced by these patients as well as their higher variance in LoS. While an important first step, further

research is necessary to understand how these factors may relate and when during the hospital stay appropriate interventions to ensure appropriate LoS may be effective.

Additionally, even when controlling for MDC and unit type, hospital of admission was important to LoS, indicating that system-level variances beyond those shared by all these hospitals (i.e. large hospital, magnet status, academic medical center) affect LoS. Thus, to fully understand hospitalizations and their outcomes, especially for vulnerable populations like individuals with psychotic disorders, a multi-level approach is vital. Important information will be lost when examining only one level, reducing the ability to make meaningful change for patient outcomes.

Finally, this mixed methods study demonstrates that there is value in examining the experiences of patients who are hospitalized and using their experiences to inform analyses of hospital outcomes. Previous research has used information from hospital outcomes for specific populations to inform qualitative interviews (Brooks Carthon et al., 2017) but, to the authors' knowledge, this is the first paper that has used patient experiences of hospitalization to inform variable selection and analyses for a quantitative study of hospital outcomes. Many of the processes that patient's spoke about were not common but almost all were highly related to LoS. Further analyses of their relationship to other outcomes like readmissions and adverse events are necessary. To begin to address the hospital outcomes disparities experienced by individuals with psychotic disorders in the healthcare system, further research, especially mixed methods research with providers and patients, must be conducted so that we can better understand their hospitalizations, create risk profiles for those at highest risk for poor outcomes and create effective, ethical and economically viable interventions.

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Table 4.1

Length of Stay for Non-Psychiatric Hospitalizations of Patients with Psychotic Disorders vs. Patients with No Psychiatric Comorbidity

Citation	Median (IQ Ranges)	Average (SD)	Other
Bot et al. (2014)		5.7 (3.9) vs. 3.7 (3.5)	
Buller et al. (2015)		5.7 (4.2) vs. 5.1 (3.2)	
Daumit et al. (2006)	5 (3-10) vs. 3 (2-6)		
Gholson et al. (2018)		3.85 (2.14) vs. 3.22 (1.32)	
Khaykin 2010	4.6 (2.8-7.6) vs. 3.6 (2.3-5.9)		
Liao et al. (2013)		24.9 (107.5) vs 9.5 (85.4)	
Menendez et al. (2013)		11 (21) vs. 7.2 (8.3)	
Menendez et al. (2014)		13 (21) vs. 4.8 (7.6)	
Schwartz et al. (2018)			45.2% had a length-of-stay over 7 days, vs. 28.5% for general population
Smith et al. (2012)		7.6 (9.2) vs. 6.8 (8.5)	

Note. All LoS measures were statistically significantly different at $p < .01$ or less.

Table 4.2

Quantitative Variable Creation

Variable	Definition
Age	Age at index admission
Gender	Gender at index admission
Partnered	Reported married or partnered at index admission
Public Insurance	Medicare, Medicaid or state-operated HMO paid for hospitalization
White, non-Hispanic	Self-reported as both White and Non-Hispanic at index admission
Outpatient Appointment Six Months Prior	Any outpatient appointment in the healthcare system in the six months prior to discharge
Discharge to a Psychiatric Facility	Discharge disposition “Discharge to a psychiatric facility” or “discharge to a psychiatric unit”
Care in an ICU	Admitted to a unit that provided intensive care services, at determined by status as an ICU in the hospital registry
Admitted by Hospitalist	Admitted to the Hospitalist Service during admission
Pharmacist Consult	Completed order of “consult by pharmacy” or similar order during index hospitalization
Physical Restraints	Completed order of “physical restraints to protect self or others” or similar order during index hospitalization
IM Sedative or Antipsychotic	Completed order of an IM delivered antipsychotic or sedative (non-long acting) during index hospitalization
Psychiatric Consult	Completed order of “consult with psychiatry” or similar order during index hospitalization
Social Work Consult	Completed order of “consult with case management” or “consult with social worker” during index hospitalization
Continuous Observation	Completed order of “continuous observation for patient safety” or similar order during index hospitalization

Diagnosis of Schizophrenia	Diagnosis of ICD-9 295.0X, 295.1X, 295.3X, 295.6X, 295.8X, 295.9X or ICD-10 diagnosis of F20.XX except F20.81 during index hospitalization.
Comorbid Psych Condition	Diagnosis present for any non-psychotic psychiatric disorder during index hospitalization
Comorbid Substance Use Condition	Diagnosis of any substance use disorder during index hospitalization
Elixhauser Comorbidities	Per the Elixhauser comorbidity index(Elixhauser et al., 1998; Quan et al., 2005)
Admit Hospital	Hospital to which patient was admitted for index hospitalization

Table 4.3

Psychotic Disorders

DSM-5 Disorder	ICD-10 Codes	Description
Schizophrenia	ICD-9: 2950X, 2951X, 2952X, 2953X ICD-10: F20, F20.XX except F20.8, F20.81	Two or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative symptoms Symptoms cause functional loss and last at least 6 months
Schizophreniform Disorder	ICD-9: 2954X ICD-10: F20.8, F20.81	Two or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative symptoms. Symptoms cause functional loss and at least 1 month but not more than 6
Schizoaffective Disorder	ICD-9: 2957X ICD-10: F25, F25.XX	Meet criteria for Schizophrenia with concurrent Mood episode (Manic Episode or Major Depressive Episode)
Delusional Disorder	ICD-9: 2971 ICD-10: F22, F22.XX	Delusion that last more than one 1 month, no diagnosis of schizophrenia
Brief Psychotic Disorder	ICD-9: 2988	One or more of: delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, negative

	ICD-10: F23, F23.XX	symptoms Symptoms cause functional loss and at least 1 day but not more than 1 month
Unspecified Schizophrenia Spectrum Disorder	ICD-9: 2956X, 2958X, 2959X ICD-10: F29, F29.XX, F20.89, F24, F24.XX	Significant functional impairment due to symptoms of one or more schizophrenia spectrum disorder without meeting full criteria
Bipolar Disorder with mood congruent/incongruent Psychotic Features	ICD-9: 29604, 29614, 29644, 29654, 29664 ICD-10: F30.2, F30.2X	At least one period of elevated, expansive or irritable mood with delusions or hallucinations during this manic episode
Major Depressive Disorder with mood congruent/incongruent Psychotic Features	ICD-9: 29624, 29634 ICD-10: F32.3, F23.3X, F33.3, F33.3X	A period of sad, depressed or down mood with hallucinations or delusions during the depressive episode

Note. Descriptions adapted from APA (2013). X or XX indicates any valid integers from 1-9 which can result in a valid ICD-10 code.

Table 4.4

Demographics, Hospitalization Characteristics and Processes (n=4073)

Total	N=3900
Variable	Mean (St. Dev)
Age	52.9 (14.9)
Length-of-stay	6.9 (11.3)
Variable	Count (%)
Gender (Female)	2163 (53.3%)
Race	
Asian	65 (1.7%)
Black or African-American	2574 (66.1%)
White	1133 (29.1%)
Other	194 (4.7%)
Hispanic Ethnicity	123 (3.2%)
Married or Partnered	542 (13.9%)
Insurance	
Commercial	157 (4%)
Medicare	1541 (39.51%)
Medicaid	1995 (48.99%)
Insurance – Public	3597 (88.1%)
Uninsured	69 (1.76%)
Other (e.g. no fault, workman’s comp, other HMO)	239 (6.1%)
Comorbidities	
0	342 (8.7%)
1	768 (19.7%)

2	859 (22%)
3	771 (19.7%)
≥4	1155 (29.62%)
Hospitalization Characteristics and Events	
Variable	Count (%)
Type of Admission	
Emergency	2642 (67.4%)
Elective	888 (22.8%)
Other	370 (9.49%)
Admitting Unit Type	
Med-Surg	2267 (58.1%)
ICU	250 (6.4%)
Oncology	178 (4.6%)
Surgical	967 (24.8%)
Other	238 (6.1%)
Orders and Processes	
IM Sedative or Antipsychotic	27 (0.7%)
Physical Restraint	132 (3.4%)
Continuous Observation	35 (0.9%)
Psychiatry or Behavioral Health Consult	144 (3.7%)
Social Work Consult	46 (1.2%)
Hospitalist Service	463 (11.9%)
Outpatient Appointment Six Months Prior to Index Hospitalization	1967 (50.4%)
Discharge Disposition	
Other Hospital	51 (1.3%)
Correctional Facility	13 (0.3%)

Home Health	1027 (26.3%)
Hospice	34 (0.9%)
Rehabilitation Facility	111 (2.9%)
Psychiatric Facility	435 (11.2%)
Skilled Nursing Facility	570 (14.6%)
Left Against Medical Advice	89 (2.3%)
Routine Discharge to Home	1519 (39.0%)
Other (e.g. long term or intermediate care)	51 (1.3%)

Note. Not all percentages equal 100% in every category due to missing data or participants meeting criteria for multiple categories

Table 4.5

Psychiatric Diagnoses of Sample (n=3900)

Total	N=3900
Diagnosis	Frequency (%)
Psychotic Disorder Diagnoses	
Schizophrenia	2058 (52.8%)
Schizoaffective Disorder	568 (14.6%)
Schizophreniform Disorder	18 (0.5%)
Delusional Disorder	268 (6.9%)
Brief Psychotic Disorder	48 (1.2%)
Psychotic Disorder NOS	383 (9.8%)
Major Depressive Disorder w/ Psychotic Features	1412 (36.2%)
Bipolar Disorder w/ Psychotic Features	1105 (28.3%)
Number of Psychotic Disorder Diagnoses	
1	2353 (60.3%)
2	1198 (30.7%)
3	291 (7.5%)
4	52 (1.3%)
5	5 (0.2%)
Comorbid Psychiatric Disorders without Psychotic features	
Anxiety Disorder	366 (9.4%)
PTSD	127 (3.3%)
Bipolar Disorder	827 (21.2%)
Depression	915 (23.5%)
Other Mood Disorder	109 (2.8%)

Dissociative Disorder	29 (0.7%)
Personality Disorder	33 (0.9%)
Other Psychiatric Disorder	96 (2.5%)
Substance Use Disorders	
All Substance Use Disorders	1630 (41.8%)
Alcohol	432 (11.1%)
Cannabis	152 (3.9%)
Cocaine	331 (8.5%)
Opioids	151 (3.9%)
Sedatives	65 (1.7%)
Stimulants	20 (0.5%)
Tobacco	1123 (28.8%)
Others (e.g. hallucinogens, inhalants)	159 (4.1%)

Note. Not all percentages equal 100% in every category due to missing data or participants meeting criteria for multiple categories.

Table 4.6

Independent Variables, Variable Source and Quantitative Model – Patient Characteristics (n=4073)

Variable	Source ^b	Beta (Confidence Interval)	p-value	Exp (B)	Percent Effect on LoS ^c
Intercept		1.16423	0.043		
Diagnosis of Schizophrenia	Interviewer Notes: Patients with schizophrenia had lower UBACC scores and were more likely to struggle with communication during interviews	0.014 (-0.03, 0.058)	0.53	1.01	+1.4%
Deficiency Anemia	“I have a broken ankle. I was in a rehabilitation hospital for about a month. It was very depressing” P4, hospitalized for accidental drug overdose “Well, no, my children called the ambulance for me, complained that I was mixed up and I was complaining of my bladder, going every hour. And I needed something, some medication or something.” P7 “What brought me here is that I can’t breathe. I’m having problems breathing and I can’t walk far, and I can’t walk up and down steps.” P10 “I started to get sick. I couldn’t walk more than ten or 20 yards without being able to—	0.20 (0.15, 0.26)	<.001*	1.22	+22%
Congestive Heart Failure		0.23 (0.15, 0.31)	<.001*	1.26	+26%
Coagulopathy		0.30 (0.21, 0.39)	<.001*	1.35	+35%
Diabetes wo/ Complications		0.12 (0.033, 0.21)	0.0067*	1.13	+13%
Diabetes w/ Complications		0.21 (0.12, 0.30)	<.001*	1.24	+24%
Hypothyroidism		0.091 (0.0092, 0.17)	0.029*	1.10	+9.5%
Electrolyte Disorders		0.25 (0.20, 0.30)	<.001*	1.28	+28%
Neurological Disorders		0.094 (0.034, 0.15)	0.0021*	1.10	+9.8%

Paralysis	I huffed and puffed, I couldn't breathe and then I had a cyst on top of my head, so. I combined both and came in." P12	0.26 (0.12, 0.41)	<0.001*	1.30	+30%
Peripheral Vascular Disease		0.16 (0.043, 0.28)	0.0076*	1.18	+18%
Pulmonary Circulation	"Sciatic nerve, my arthritis, my knee replacement...Um, well, I have COPD, I have asthma." P15	0.27 (0.14, 0.40)	<.001*	1.31	+31%
Renal Failure		0.082 (0.0087, 0.16)	0.028*	1.09	+8.6%
Tumor	"Oh, sciatic nerve, my arthritis, you know and everything, no my knee, my knee replacement." P15	0.24 (0.15, 0.34)	<.001*	1.28	+28%
Valve Disorders		0.17 (0.038, 0.30)	0.011*	1.18	+18%
Weight Loss	"They say, pneumonia, both lungs...They said, emphysema...They tell me diabetes. I mean, how the fuck did I get diabetes? But I'm glad all these things been picked up now, I know what I know, and I made them understand I know." P19 "Nauseous, diarrhea. Not being able to eat. My blood sugars were 300, 400s. And they couldn't tell me why my sugars were so high." P20	0.55 (0.46, 0.64)	<.001*	1.73	+73%

Note. * significant at the $p < 0.05$ level; ^a the effect size is below the detectable limit of this analysis; ^b Source indicates source used in the determination of including each variable in the model, quotes were derived from participants in Phase 1; ^c Beta was transformed to percentage effect on length-of-stay via the formula: Percent Effect = $((e^{\beta}) - 1) * 100$ described by (IDRA, 2019)

Table 4.7

Independent Variables, Variable Source and Quantitative Model -Processes and System (n=4073)

Variable	Source ^b	Beta (CI)	p-value	Exp (Beta)	Percent Effect on LoS ^c
Intercept		0.979 (0.831, 0.126)	<0.001*		
Outpatient Appointment Six Months Prior	"The doctors that I've known for a while, across the street, they see that I'm here and they come into the room." P13	-0.104 (-0.15, -0.057)	<.0001*	0.901	-9.9%
Discharge to a Psychiatric Facility	"Now that I feel better physically, I want to go home, but when I came here, I wanted to go to the mental institution." P13	-0.0042 ^a (-0.081, 0.073)	0.9161*	0.996	-0.41% ^a
Physical Restraints	"Drug me up and tie me to the bed. Left me there. Now I'm ready to go home." P5	0.49 (0.37, 0.62)	<0.001*	2.05	+64%
IM Sedative or Antipsychotic	"I have been able to, the aids and stuff have been able to talk to me and calm me down because I get excited so fast. All the times before they kept me heavily sedated but this time I'm wide awake." P12	0.34 (0.076, 0.61)	0.012*	1.41	+41%
Psychiatric Consult	"It's really hard to get people seen by a psychiatrist, even when it's clear they need it." Staff Nurse	0.19 (0.068, 0.30)	0.002*	1.20	+20%
Social Work Consult	[About social worker] "She's helping me get my psychiatrist. She's going to make an appointment for me, and she is also going to get me into a gym." P13	0.29 (0.091, 0.49)	0.004*	1.34	+34%

	"I haven't seen a social worker." P10				
Continuous Observation	"The young lady that I have as aide in here now explained it. When I got here she explained it all." P12	0.85 (0.61, 1.08)	<0.001*	2.33	+133%
Admission Unit Type					
ICU		0.37 (0.31, 0.44)	<0.001*	1.45	+45%
Surgical		-0.159 (-0.25, -0.063)	0.001*	0.85	-15%
Oncology		0.14 (0.022, 0.25)	0.019*	1.15	+15%
Other		0.14 (0.016, 0.27)	0.027*	1.15	+15%
Med-Surg		Reference Unit Type			
Hospital					
Admit Hospital 1	"At every other hospital, I had a problem. But I come to this hospital and I don't have a problem at all. It boggles my mind." P2 “My sister said well, why don’t you go to [other hospital] or [other hospital]? My sister works at [other hospital] and she says, why don’t you go there? I said, no, I can’t go there because I like [this health system] a lot better than I like the [other health system]. Because they take real good care of you here” P13	017 (0.12, 0.23)	<0.001*	1.19	+19%
Admit Hospital 2		-0.04 ^a (-0.1, -0.02)	0.19	0.96	-3.4% ^a
Admit Hospital 3		Reference Hospital			

Note. * significant at the $p < 0.05$ level; ^a the effect size is below the detectable limit of this analysis; ^b Source indicates source used in the determination of including each variable in the model, quotes were derived from interview participants. ^c Beta was transformed to percentage effect on length-of-stay via the formula: Percent Effect = $((e^{\beta}) - 1) * 100$ described by (IDRA, 2019). ICU= Intensive Care Unit, IM = intramuscular.

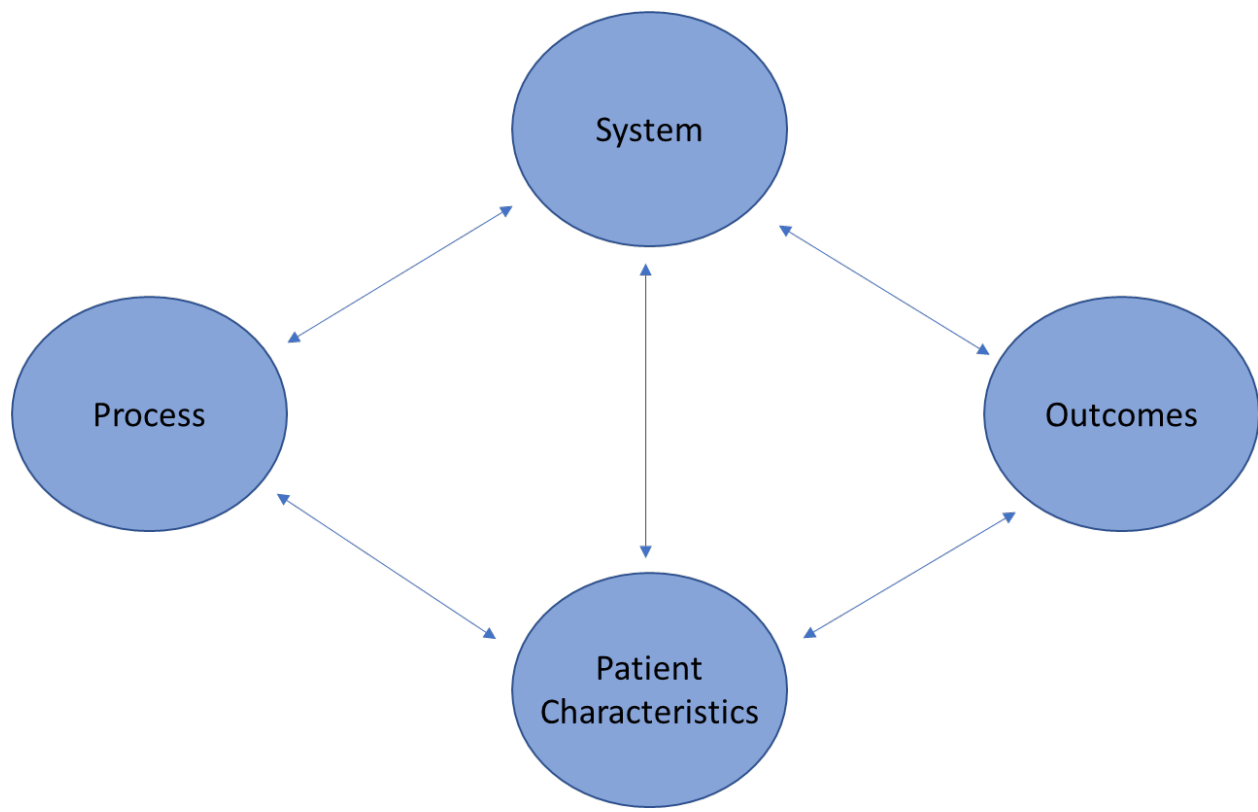


Figure 4.1 Quality Health Outcome Model adapted from Mitchell et al. (1998).

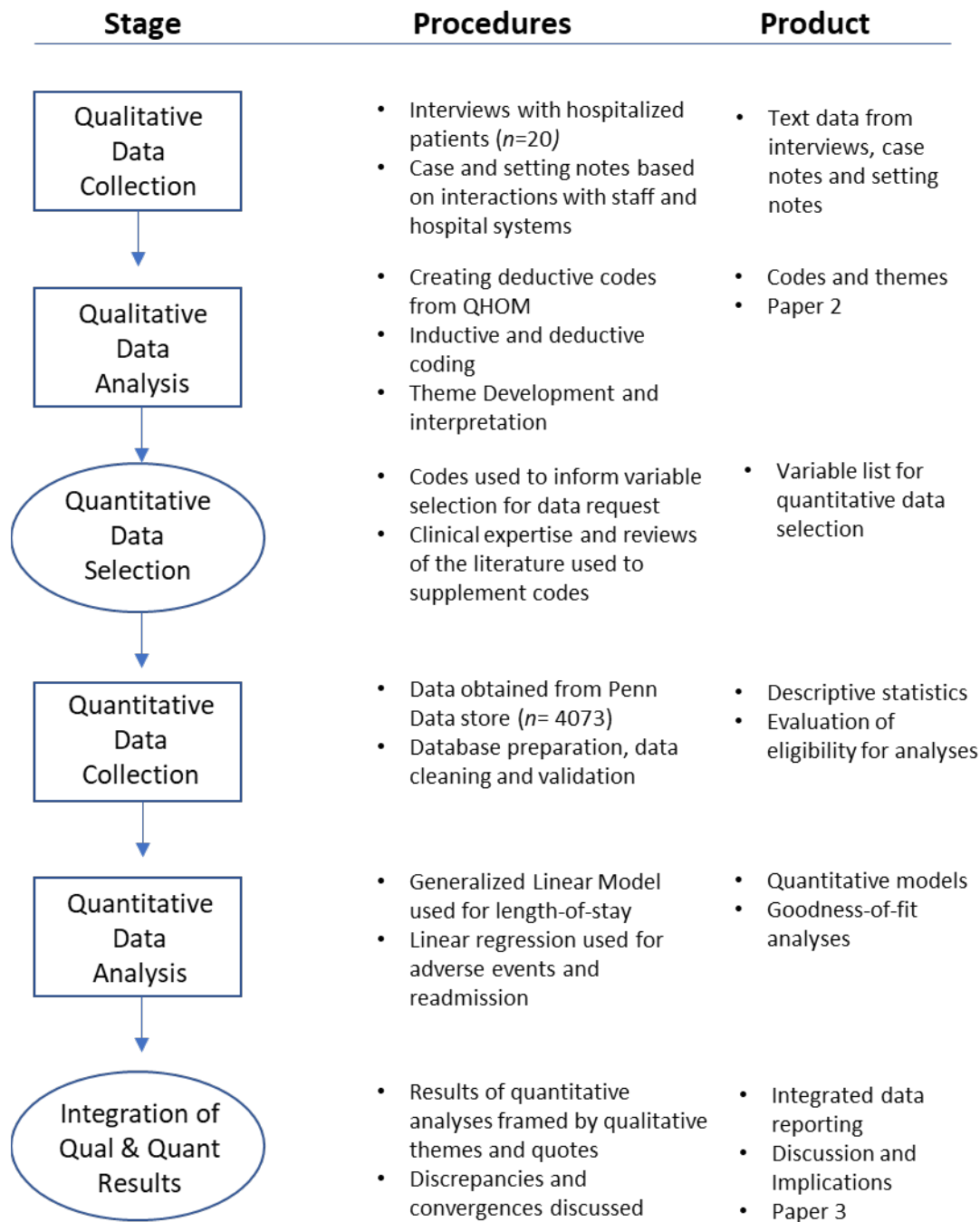


Figure 4.2 Mixed Methods Study Diagram

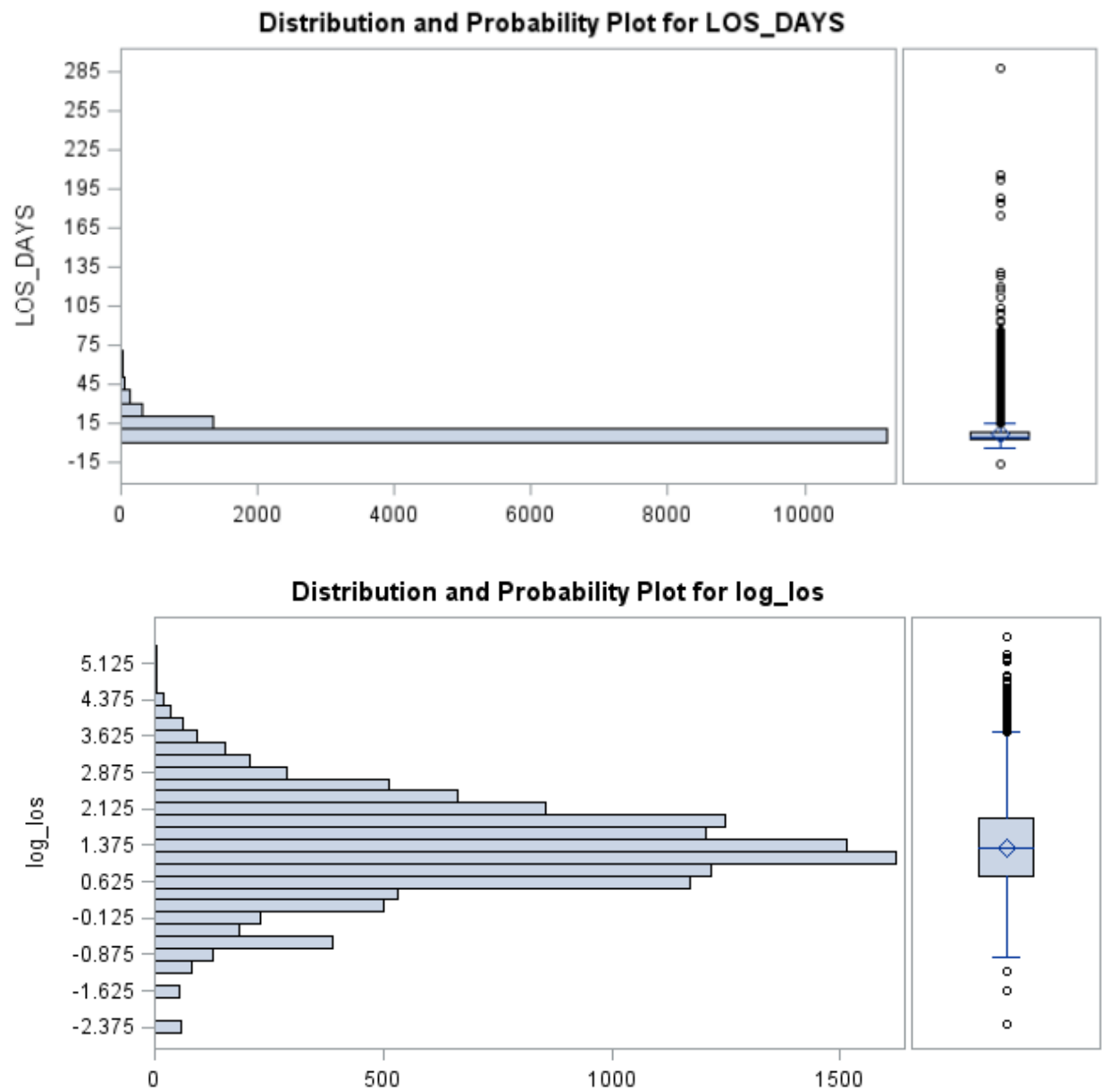


Figure 4.3: Distribution and Probability Plots of Length of Stay in Days (LOS_Days) vs. Log Length of Stay (log_los)

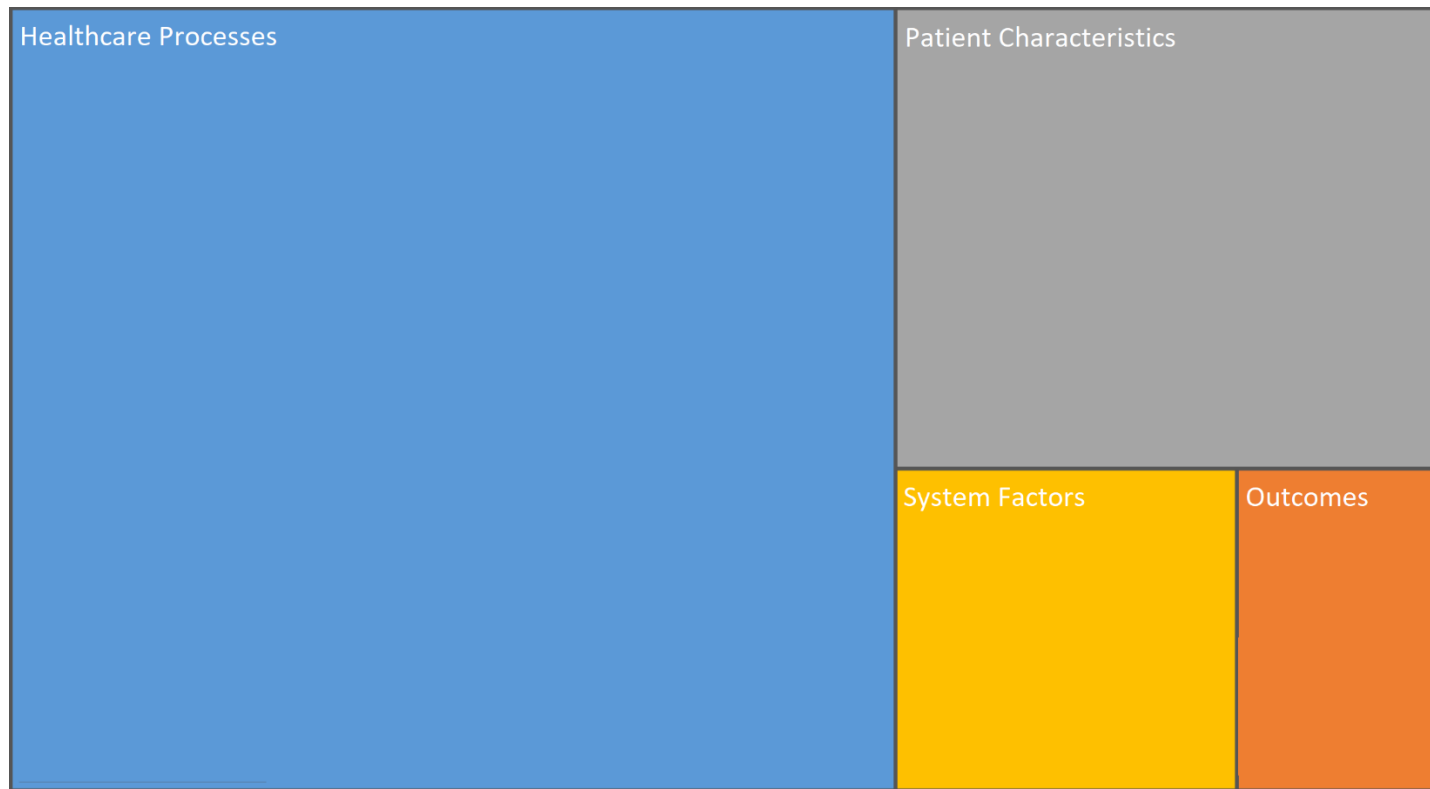


Figure 4.4 Proportions of deductive codes for each of the domains of the QHOM.

Note. Entire rectangle is 100% of deductive coding

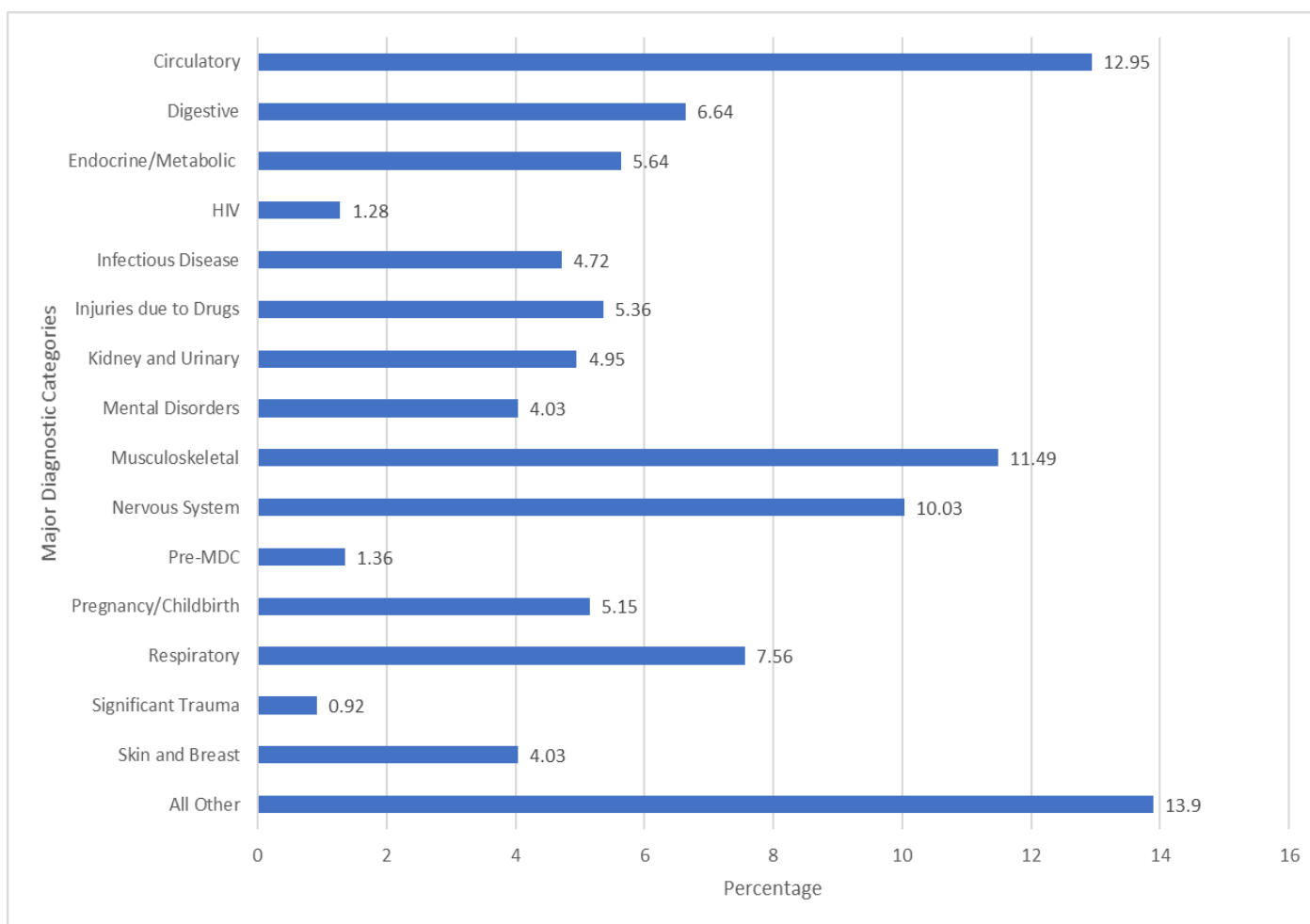


Figure 4.5. Percentage of sample in each Major Diagnostic Category (MDC)

CHAPTER 5: SUMMARY OF FINDINGS, DISCUSSION AND IMPLICATIONS

The purpose of this dissertation was to better understand non-psychiatric hospitalizations for patients with psychotic disorders. We first conducted an integrative review of the literature to understand adverse events during non-psychiatric hospitalizations for this population. By framing the results of this review through the Quality Health Outcomes Model (QHOM), it became clear that system factors, care processes and patient characteristics were different for these patients but that analyses primarily focused on comparing individuals with psychotic disorders to the general population of patients and not on identifying which factors are associated with or contribute to their elevated risk of adverse events and other poor hospital outcomes. Next, an exploratory sequential mixed methods study was conducted in two phases. In Phase 1, qualitative interviews were used to understand the experiences of patients with psychotic disorders hospitalized on medical-surgical units. These patients' perspectives provide valuable information for both healthcare providers and policy makers while also serving as the foundation for the quantitative inquiry. For Phase 2, data from the Penn Data Store of the Hospital of the University of Pennsylvania, was used to create a general linear model (GLM) of the relationship between patient characteristics, care processes and length-of-stay for patients with psychotic disorders during non-psychiatric hospitalizations. For this chapter, we will summarize the major findings of each of these sections and discuss implications for clinical practice, policy and future research.

Major Findings

The three papers of this dissertation have important information on the non-psychiatric hospitalizations of patients with psychotic disorders. By better understanding

hospitalizations for these patients, the disparities that they experience in hospital outcomes and in their overall health may be more successfully addressed.

Integrative Review

In Chapter 2's integrative review of adverse events for patients with psychotic disorders focusing on adverse events and framed by the QHOM, hospitalizations for patients with psychotic disorders were often fundamentally different than for other patients. In terms of processes of care, healthcare providers had difficulty judging these patient's physical symptoms and were less likely to give them standard-of-care surgeries. They also experienced post-operative issues when given certain medications for sedation or when their medications were withheld before surgery. In the outpatient setting, patients with psychotic disorders are less likely to receive standard of care assessments and interventions (Copeland et al., 2009; Crawford et al., 2014; Swildens et al., 2016), even though they have an increased rates of many common chronic illnesses. This disparity in treatment and assessment appears to continue when patients are hospitalized. This review reinforces that people with psychotic disorders receive different care than other patients and that their disparities may not be only attributable to factors like more medical comorbidities or psychiatric symptoms.

In line with other literature (Bresee et al., 2010; Hendrie et al., 2013; Vancampfort et al., 2015), individuals with psychotic disorders in this review were found to have more medical comorbidities and worse overall health than other patients. Medical comorbidities are highly associated with poor hospital outcomes and are an important part of health services research. Interestingly, patients with psychotic disorders at times

also delayed treatment compared to the general population. This phenomenon of treatment delay has been found in other studies of individuals with psychotic disorders (Payne, Abel, Guthrie, & Mercer, 2013; Tsay et al., 2007) but is difficult to measure effectively in larger samples or using administrative data. These individual differences vary widely but all may contribute to the poor outcomes seen by these patients.

For system factors, patients with psychotic disorders were usually less likely to be treated in teaching hospitals or academic medical centers. Smaller hospitals and non-teaching hospitals were generally more likely to treat these patients, indicating that there is some difference either in preference of access that leads patients with psychotic disorders to these settings. It is likely that the low socioeconomic status and difficulty accessing high quality care experienced by many individuals with psychotic disorders (Kisely et al., 2007; Lawrence & Kisely, 2010; Martin et al., 2014) affects hospitalizations as it does other areas of their lives.

Finally, patients with psychotic disorders had a higher risk of adverse events in studies that compared them to the general population and a high rate in non-comparison studies. The exact adverse events that were significantly more common differed across studies, but no analysis found adverse events overall to be less common for these patients, or even occurring at the same rate as the general population. Similar results have been found in reviews of adverse events in other vulnerable populations, such as people with serious mental illness experiencing surgery (Copeland et al., 2008) and older adults with dementia (Mukadam & Sampson, 2011). While some of these adverse event disparities may be related to neurological or psychological problems, disparities also exist

around adverse events in marginalized populations such as Black Americans (Metersky et al., 2011) and Maori New Zealanders (Davis et al., 2006). Thus, it is unclear to what degree patient characteristics and to what degree issues of social and economic marginalization affect the disparities in adverse events experienced by patients with psychotic disorders.

While a wide variety of different healthcare systems and subpopulations were examined, poor hospitalization outcomes were found in almost every study and deficits in processes and systems of care were clear. Unfortunately, the studies reviewed did not examine the effects of patient characteristics, care processes or systems on the rate or severity of adverse events. While the differences between patients with psychotic disorders and the general population are noted, their relationship to the poor outcomes they experience remains unclear and the mechanisms of their disparities have yet to be identified. Nevertheless, information from this review can be used to guide improvements in care for these patients and to support further research on hospital outcomes for patients with psychotic disorders. Whether these differences cause the high rate of adverse events or are simply correlated, these patients need further support in accessing consistent, quality healthcare that addresses their unique needs.

Experiences of Hospitalization

In the qualitative portion of this study, 20 patients with psychotic disorders on medical-surgical units were interviewed about their experiences of hospitalization. These interviews were analyzed using a thematic analysis approach (Braun et al., 2014a) and the following themes emerged: 1) *managing through hard times*, 2) *ignored and treated*

unfairly, 3) actively involved in health, 4) appreciation of caring providers and 5) violence: expected and experienced. Like the experiences of individuals with mental illness in outpatient primary care settings (Stumbo et al., 2018; Welch et al., 2015), participants often felt ignored and/or treated unfairly by providers. Participants had low levels of internalized stigma around mental illness but felt that providers treated them differently than they would other patients.

Possibly because of previous stigma experiences, participants greatly valued those providers with whom they did have positive interactions. They noted that simply being talked to like a person was important, because they felt so often dehumanized both in the medical and the psychiatric care setting. An additional reason that these patients felt so warmly towards providers who treated them well is that they expressed a great desire to be actively involved in their health, in the hospital and beyond. Though providers may have negative beliefs about patients with psychotic disorders and their capacity to manage their health (Stumbo et al., 2018; Sullivan et al., 2015), the patients interviewed in this study spoke about how they felt that they were not taught enough or were left out of decision making processes. They wanted to be empowered, to be fully prepared to manage their own health when they left the hospital. Unfortunately, they felt that the lack of support from providers and their medical and psychiatric symptoms together made this more difficult.

Length of Stay

Using the data from the qualitative interviews as well as clinical expertise and scientific literature to guide variable selection, a quantitative model was constructed

using the general linear model (GLM). Because the three hospitals were all academic medical centers that treat primarily adults, Magnet Hospitals, in the same city, processes and patient characteristics were the focus of the analysis. Selected patient characteristics and process variables were found to influence length-of-stay, primarily associated with the longer length-of-stay found for patients with psychotic disorders in non-psychiatric settings.

A collection of processes, though uncommon in the sampled hospitalizations, were associated with significantly longer length-of-stay. Use of intramuscular (IM) sedation or antipsychotics, physical restraints, continuous observation by staff and an order for consult from psychiatric services were all associated with longer length-of-stay. Hospitalizations with these processes were substantially longer, especially for physical restraint and continuous observation. These individuals may be experiencing intense symptoms of their psychotic disorder, which may require patient management techniques such as restraints to manage in the inpatient setting. Use of restraints has been associated with extended length-of-stay in other populations (Bai et al., 2014; Barnett et al., 2012) and in psychiatric settings (Compton, Craw, & Rudisch, 2006) but it is unknown whether these individuals have extended length-of-stay due to the effects of restraints, which are associated with adverse events (Barnett et al., 2012) or due to the behaviors or symptoms that led to restraint use such as psychosis or agitation.

Patients with multiple conditions require more time to properly diagnose, treat and educate around self-care than would be appropriate for other patients (Parekh & Barton, 2010). In the hospital setting, medical comorbidities besides the reason for

admission logically contribute to extended length-of-stay (Ofori-Asenso et al., 2018; Potretzke et al., 2016; Potts et al., 2019; Thombs et al., 2007). Patients in this study had a high number of comorbidities, with a third of the patients having four or more Elixhauser comorbidities, not including psychosis, depression and drug abuse. The results of this study agree with the growing body of literature that finds a high overall medical disease burden among individuals with psychotic disorders, in and out of the hospital setting (Bresee et al., 2010; Bushe & Holt, 2004; Carney et al., 2006). While the low rate of diabetes and obesity diagnoses is notable, due to the high rate of these conditions generally found in this population (De Hert et al., 2006; Depp et al., 2014), the overall finding of a high degree of both chronic and acute medical conditions was in accordance with previous literature.

Many, though not all, of the Elixhauser comorbidities had a significant effect on length-of-stay, similar to results found in other studies (Potretzke et al., 2016; Potts et al., 2019). Though a composite measure was not used, as it is not recommended for use with the Elixhauser Comorbidity Index (Elixhauser et al., 1998), fifteen comorbidities were associated with longer length-of-stay. Weight loss and coagulopathy had the largest effect on length-of-stay but ten comorbidities were associated with a 20% or more increase in length-of-stay. Certain comorbidities that are common in the population of patients with psychotic disorders, such as renal failure and hypertension, had no significant effect. Further research must be conducted to determine why certain comorbidities are associated with longer length-of-stay and if there is actually an underdiagnosis of some of these conditions in these populations as previous research has found lack of assessment

for common chronic conditions in this population in other settings (Crawford et al., 2014).

Integration

Integration was fundamental to this mixed methods study. The reported experiences of patients with psychotic disorders drove data selection and interpretation of the quantitative analyses. The length-of-stay model was developed within the context of the participants' reported experiences of non-psychiatric hospitalization. In an additional mixing, the qualitative and quantitative results were examined together. An important point of convergence was the high level of medical comorbidities experienced by patients, especially during a single hospitalization. One participant noted that he had waited to come to the hospital till he had multiple acute and chronic conditions that needed medical attention, "adding them together to make it worth it." Fifteen of the Elixhauser comorbidities were associated with longer length-of-stay, to various degrees and most participants had two or more of these comorbidities. Diabetes, both with and without complications, was significantly related to longer length-of-stay and management of diabetes was a key an important consideration for many of the participants in the qualitative interview. One participant spoke about how she would not be discharged until the hospital felt that she could manage her blood sugar on her own, demonstrating how this diagnosis can contribute to longer length-of-stay. In a point of divergence, weight loss was associated with the largest increase in length-of-stay but was not discussed by any of the participants in the qualitative interviews. Certain comorbidities may be more salient to patients and, thus more likely to be spoken about during an interview, even if

their effects are smaller. Thus, comorbidities like heart failure and diabetes were associated with length-of-stay and discussed in the qualitative interviews while weight loss and obesity were significant in the quantitative model but not discussed by participants.

The hospital of admission and unit type were found to have a significant effect on length-of-stay, though they were not the focus of analysis. In the qualitative interviews, patients spoke extensively about their preference of certain hospitals and health systems over others, indicating that there may be system differences experienced by patients which are worth consideration. The quantitative model showed that admitting hospital did have significantly different length-of-stay, even when controlling for major diagnostic categories and medical vs. surgical admissions. While issues of case mix and specialties may have played into this variance, it is also likely that there are differences among even structurally similar hospitals that create differences in length-of-stay for patients with psychotic disorders.

Finally, an important convergence was the rarity of psychiatric and social work consults found in the quantitative analysis and the reports of lack of care and treatment for psychiatric needs by participants in the qualitative interviews. Patients wanted to talk to someone about their mental health, how they felt and how they were managing their complex psychiatric conditions in the context of the medical-surgical hospitalization. Unfortunately, they felt that there was no one to talk to and the non-psychiatric providers were either uncomfortable or unwilling to engage. They felt that their symptoms, especially depression and anxiety, were being exacerbated by their illness and/or the

hospital environment. In the quantitative data, less than five percent of patients had a completed order of a consult from psychiatry. Patients with high levels of psychiatric symptoms, or symptoms that interfere with care, may be those who receive these services, as these consults were associated with a longer length-of-stay. Those patients with less severe mental health issues, or symptoms that do not interfere with care delivery, may not receive any psychological support during their time in the hospital because it is not interfering with care or with post-discharge placement. As interviewed patients reported substantial depression and anxiety, as well as psychosis and other mental health symptoms, there is an unmet need among these patients that must be addressed.

Further Analyses

The secondary outcomes, adverse events and readmissions, were not analyzed in the three manuscripts. Nonetheless, the data that was used for length-of-stay analyses has been prepared which will examine the role of patient characteristics and process factors in hospital outcomes. Additionally, a final analysis will take place that examines potential interactions between these phenomena. Literature on other groups has found relationships between adverse events and length-of-stay (Classen et al., 1997; Hauck & Zhao, 2011; Hoogervorst-Schilp et al., 2015; Kim et al., 2012), adverse events and readmissions (Basques, Webb, Bohl, Golinvaux, & Grauer, 2015; Dormann et al., 2004) and length-of-stay and readmissions (Schneider et al., 2012; Vorhies, Wang, Herndon, Maloney, & Huddleston, 2011) but these have not been examined for patients with psychotic disorders in the non-psychiatric hospital setting.

Study Limitations

Qualitative Interviews

The qualitative interviews were a key part of this mixed methods study but have limitations that must be acknowledged. First, interviews were focused on hospitalization experiences overall. Questions were not focused on hospital outcomes, though length-of-stay, adverse events, and readmission were all discussed by participants. Interviews that were more focused on hospital processes and patient characteristics may have gathered more information useful for the quantitative analysis. Nevertheless, this open-ended approach gives valuable insight into the experiences of these patients and how they experience medical-surgical hospitalization. Even with this limitation, enough data was available to ground the quantitative analyses in the results of the qualitative data through guidance of data selection.

Also, qualitative research may be prone to bias from researchers, especially those who have experience in the field in which they are conducting the research. Previous experiences and opinions shape the lens through which researchers interpret qualitative data. The first author of these studies conducted all interviews and was primarily responsible for code development and interpretation. He has significant clinical experience working with individuals with serious mental illness, especially psychotic disorders, which may have introduced bias. A research protocol based off of the work of Morse (2015) was set in place to address biases and improve the rigor of the qualitative inquiry and results. The lead author presented his codes, themes and interpretations to a team of researchers at multiple points. These sessions involved individuals with a variety

of experiences in qualitative research and mental health research. Participants provided valuable critiques and balance to the first author's preconceived notions, bringing both coding and interpretation closer to the data and the experiences of the patients. Two coders were used for 20% of the qualitative interviews, one of whom had no previous experience working with individuals with mental illness and an interrater reliability assessment was conducted, in addition to a critical analysis of each code to refine definitions and reduce biases. While the individual interpreter will always be a part of qualitative inquiry, these processes served to reduce bias, increase rigor and strengthen the results of this qualitative research.

Reliability of Measures

Two of the measures used in Phase 1, the USCD Brief Assessment of Capacity for Consent (UBACC; Jeste, et al. 2007) and the Brief Version of the Internalized Stigma of Mental Illness (ISMI-10; Boyd et al., 2014) demonstrated poor reliability. A portion of this poor reliability may have come from the small sample size, only twenty individuals, but the low reliability indicates that we should be cautious when making inferences from these measures about this sample or population and that the further use of these measures in this population requires careful consideration.

The UBACC was normed on individuals with schizophrenia, recruited from Department of Veterans Affairs sites, so its poor performance on the Appreciation sub-scale was unexpected. Two factors may have affected this low reliability score. First, two of the items in the Appreciation sub-scale had zero variance and therefore had to be excluded from calculations. Also, item six in the sub-scale, which asked about tasks

expected of the participant if they enrolled in the study, accounted for much of the poor performance of the scale. This item had a negative corrected item total correlation with the other variables in the sub-scale and, when removed, the subscales performance was more acceptable (Cronbach's $\alpha=0.404$). The change from the outpatient to the inpatient setting and from clinical trial to qualitative research may have also decreased the reliability of this measure. Further research is necessary to determine if this is an appropriate measure to assess for capacity to consent for similar patient populations.

The ISMI-10 was normed on individuals with serious mental illness, also recruited from the Department of Veterans Affairs outpatient services but showed poor reliability (Cronbach's $\alpha=0.30$). As described by Boyd et al. (2014), the ISMI-10 is a 10-item version of a longer scale with multiple sub-scales but should be considered as a single instrument and not five scales of two items each. During validation, researchers found a Cronbach's alpha of 0.75 but there may be differences between the two populations that make it less reliable for this study's population. Patients in Phase 1 reported low levels of internalized stigma, in both the standardized assessment and their narratives. They articulated experienced stigma but did not have substantial amounts of internalized stigma around mental illness; they viewed it as a problem that others had when interacting with them. Additionally, veterans' experiences of mental illness stigma may be different than the non-veterans recruited for this study. For both measures, there is a need to determine if they still maintain their reliability when used on this population or in this setting.

Electronic Health Record Data

Though they have become a large part of health services research, electronic health records (EHRs) were originally developed for billing and patient care purposes (Coorevits et al., 2013). They may be used for research but the information is not collected primarily for research purposes (Dean et al., 2009). In primary, quantitative data collection, there are consistent methods for assessing a variable, with defined categories and specific methods of measurement. Protocols are developed and used to ensure that the data collected, as much as possible, represents what it is meant to represent. Unlike primary data collection, or even secondary data analysis of previously collected research data, electronic health records are not built upon protocols or agreed upon measurement. Rather, EHR datasets come from the input of thousands of individuals collecting data for clinical treatment and billing purposes. The data is often “good enough” to provide information necessary for care provision or payment processing and is rarely guided by strict protocols of data collection. For example, in primary data collection, participants may be weighed by a study nurse who uses an electronic scale. In an EHR, the data for patient weight may come from a nurse weighing the patient, patient self-report or providers estimating weight, but each would be represented by the same variable in the system. Despite its flaws, HER data is still valuable as one of the primary tools of health services research, especially when one is aware of the limitations of the data (Coorevits et al., 2013). The use of consistent terminology, research-backed methods and careful consideration during data selection increase the generalizability and usability of EHR-based research (Dean et al., 2009). In this study, the use of length-of-stay as the primary outcome is more reliable than other potential EHR-derived outcomes because it is

measured automatically based on admission to discharge and not entered by a person. Process variables may be less reliable than these outcomes measures but by using completed orders, we avoid the danger of overestimating the prevalence of processes that may have been ordered multiple times or ordered and never completed.

Sampling

In both phases of this study, sampling was based on psychiatric diagnoses, specifically those present in the EHR. Psychiatric diagnoses are not stable and individuals who meet criteria for one diagnosis may meet criteria for a different diagnosis later (McGlashan et al., 2005). Beyond fluctuations in symptoms, diagnosis of psychiatric disorders is often imprecise, and different providers could diagnose the same patient with different diagnoses (Aboraya, 2007; Galeazzi, Ferrari, Mackinnon, & Rigatelli, 2004). This potential unreliability in diagnoses was found in both the qualitative and quantitative samples, as many of the patients had multiple psychotic disorder diagnoses in their medical records. Some of the psychiatric diagnoses that individual patients had were actually mutually exclusive with their other diagnoses (APA, 2013). By examining the broader category of people with psychotic disorders, rather than single diagnoses only, some of the issues of poor diagnostic reliability was reduced but all studies of individuals with psychiatric disorders must be taken in the context of the imprecision and fluctuating nature of psychiatric symptoms and diagnoses.

In addition to issues of reliability of psychiatric diagnosis given by providers, there are also systematic biases around psychiatric diagnoses. Black individuals in the United States are more likely to be given a diagnosis of a psychotic disorder such as

schizophrenia, even when presenting with the same symptoms as White individuals who receive diagnoses of mood disorders or bipolar disorder. (Bresnahan et al., 2007; Trierweiler, Muroff, Jackson, Neighbors, & Munday, 2005). This systematic difference in psychiatric diagnoses has been a part of the American mental health system for decades (Metzl, 2010; Simon, Fleiss, Gurland, Stiller, & Sharpe, 1973) and means that samples of individuals with psychotic disorders may have overrepresentation of Black and African-American individuals. Both the qualitative and the quantitative samples were 50% or more Black or African-American, which may indicate bias in diagnoses. Conversely, both studies also took place in Philadelphia where more than 40% of the population identifies as Black or African-American (U.S. Census Bureau, 2019). It is unknown whether this over sampling is due to overdiagnosis of psychotic disorders or accurately representative of the patients who present to the three hospitals.

Despite these limitations, the study was still a rigorous approach to examine the hospital outcomes of a large groups of individuals that are marginalized, often excluded from research and difficult to recruit. Until prospective, direct data collection on hospitalizations are conducted on the health of people with psychotic disorders, the use of electronic health records and recorded psychiatric diagnoses will remain the most effective way of conducting research on hospital outcomes and other health factors for this vulnerable population.

Model Fit

The quantitative model that was created for this study had a moderate predictive validity ($r^2=.34$), which indicates that only 34% of the variance in length-of-stay is

accounted for by the developed model. Compared to other hospital outcomes, length-of-stay has a high variance, especially for people with mental illness (Sayers et al., 2007). Many factors affect length-of-stay that can be difficult to integrate into statistical models, such as space and staff availability for assessment and treatment. For instance, one patient in the qualitative interviews spoke about having to wait to be discharged until after a stress-test, which could not be conducted on the weekend and he was admitted to the hospital on a Friday afternoon. Another spoke about awaiting placement in a psychiatric facility because all the ones in the area were currently full. The variance associated with length-of-stay may not be able to be fully modeled, as so much of it is context specific. Thus, despite the relatively low r^2 , this model is still important as it predicts over a third of the variance in length-of-stay and can be used to identify those patients at highest risk for extended length-of-stay.

Patient-Centered Approach

This study centered the perspectives and experiences of patients with psychotic disorders via a mixed methods approach. Collecting information on and furthering our understanding of their hospitalizations was the primary goal of Phase 1 of this study. The results of these interviews were then used to guide variable selection in the quantitative portion of the study and to interpret the findings. This approach empowers these individuals and gives value to their stories and perspectives of the healthcare system which have been long denied but also comes with important limitations.

People with psychotic disorders, even when they are experiencing an acute psychotic episode, still understand their surroundings and events that affect them. Even

when in acute psychosis requiring hospitalization, these individuals retain important information and can discuss their experience of hospitalization (Bø et al., 2016). Nevertheless, psychosis can make individuals reports of their experiences unreliable, as they have experiences that are not shared by others around them (APA, 2012). An individual's report of mistreatment by a nurse or experiencing an illness may be a product of their psychosis rather than of an actual event. A large sample size for qualitative interviews was used, twenty distinct individuals, so that themes and experiences that repeated could be identified, as it is unlikely that the same psychosis experiences would be shared by multiple, unrelated participants. Additionally, the interviewer was a mental health clinician with experience working with adults with individuals with psychotic disorders. While an individual narrative may be suspect, the repeated patterns identified in the thematic analysis likely are not due to psychosis but the shared experiences these individuals have of medical-surgical hospitalization.

Interviews for this study were conducted with the sole purpose of capturing patient's thoughts and experiences of hospitalization, which excludes other valuable sources of information such as healthcare providers and family members. A wide variety of providers and hospital staff may interact with a patient during their time in the hospital, including nurses, physicians, nursing assistants, medical residents, social workers, physical therapists, and more. Each likely has had experiences engaging with individuals with psychotic disorders and may have had insight into their hospitalizations and outcomes. While setting notes did contain some information about nurse experiences and thoughts on patients with psychotic disorders, these were mentioned in passing and

no in-depth interviews were conducted other than with patients. Future research should bring in the perspectives of these healthcare professionals, especially nurses, to better understand the course of hospitalization for these patients.

Implications

Clinical Implications

The results of this study have important implications for clinical practice. The first is to reinforce the idea that patients with psychotic disorders are, before anything else, patients. They should be treated respectfully by providers, treated as humans or simply “treated more sane” as one participant noted. Even if providers do not feel prepared to deliver effective care to this population, many of their desires were the things that all patients want: to be spoken to clearly and directly, to be well educated on how to maintain their own health, to be treated with dignity and respect. Further training may be necessary to enhance the effectiveness of providers when engaging with this population but if providers engage actively with these patients and treat them with respect, many of their concerns will already have been addressed.

Another important clinical implication of this research is that individuals with psychotic disorders are very aware of their surroundings and their interactions with others. A provider may avoid a patient because they are uncomfortable around people experiencing psychosis or other mental health symptoms, but participants knew that it was happening and felt hurt by this behavior. Behaviors that stem from low comfort with the situation such as avoiding eye contact or speaking about the patient rather than to them were noticed and felt alienating and dehumanizing. Providers, especially nurses

who must work closely physically and psychologically with their patients, must make a point to engage with patients with psychotic disorders respectfully and in ways that do not further stigmatize them. Patients noted that providers who sat down when talking to them, explained confusing concepts or asked them about their experiences were valued greatly. Providers do not need to learn a new communication skill set to successfully engage with these patients, simply use generally accepted communication best practices.

From Phase 2, there are also important clinical implications. Patients with medical comorbidities are generally at risk for longer length-of-stay, which is not unexpected, but the relationship between certain care processes and length-of-stay requires further consideration. Individuals who received psychiatric consultation, continuous observation, intramuscular sedation or physical restraints were found to have a longer length-of-stay. This data does not suggest a causative relationship, but clinical providers who care for patients who receive these interventions should be aware that these patients are likely to be hospitalized for a longer period. If a patient requires that someone watch them at all times or be physically tied to keep them safe, finding them an appropriate facility or after hospitalization placement may be difficult, especially if discharge planning does not take into account both their medical and psychiatric needs. These findings indicate that these orders associated with longer length-of-stay should come with a notification to relevant providers, including social workers and nurses, so that plans can be made for safe and timely discharge.

Finally, violence has become associated with individuals with psychotic disorders, even if that reputation is not fully deserved (Fazel et al., 2009; Iozzino et al.,

2015). In the qualitative interviews, patients said that their anger came out of fear and frustration rather than any desire to hurt other people. Thus, though clinicians should be aware that patients with psychotic disorders may be prone to frustration and fear, especially as many have had poor experiences with the healthcare system in the past. Providers should work to reduce their fears rather than responding to anger or frustration that may be presenting. One participant spoke about how she felt even more afraid and angry when security was called on her after she yelled at a nurse, but after being given a chance to lie down in her room with the light off, felt better and was able to apologize and develop a positive relationship with the providers. Verbal de-escalation, rather than physical restraints, should be incorporated into clinical practice and proactive steps be made to reduce the fear that the hospital environment can create. To clinicians, the hospital is the place that they work but for many patients, it is a scary place where people use words they do not understand, and they experience pain and other physical symptoms. Helping these patients to explain their fears to staff and taking active steps to address them may reduce patient-provider conflict, improve work environment for staff and patient outcomes.

Policy Implications

The results of this study have policy implications at multiple levels, from individual units to public insurance policy. At the unit and hospital level, policies should fully address the role of psychiatric diagnoses in staffing for inpatient physicians, nurses and other providers. With their increased prevalence of multiple medical comorbidities and psychological symptoms that may complicate care, patients with psychotic disorders

may simply require more work than other patients. For nurses, staffing ratios should take this into account and smaller ratios given to nurses caring for these patients. Delivering the necessary education to manage their illness may take more time, in addition to the increased care if they have the multiple comorbidities. Similarly, physicians who are managing these patients may have to consult with mental health providers and other specialists to provide the most effective care to these patients. Policies that allow for lower provider-to-patient ratios for these patients may alleviate some of the burden on staff and lead to better hospital outcomes.

At the level of the hospital and healthcare system, providers should be trained to deliver the best possible care to individuals with psychotic disorders and other individuals with mental illness. There is a longstanding division of psychiatric care and medical care in the United States that must be addressed at the health system level. Initially, systems should work to strengthen connections between mental health providers and inpatient medical-surgical services. Inpatient providers should be encouraged to reach out to mental health providers and speak to them about how best to manage patient's psychiatric needs during hospitalization. For some patients, mental health providers may be able to come to the unit and provide therapeutic support during the inpatient hospital stay. Ignoring the psychological health of patients with psychotic disorders, or providing treatment only by medication, is unlikely to address their needs adequately and may contribute to these patients' poor hospital outcomes.

As over 85% of the quantitative sample for this study had public insurance at the time of discharge from the hospital, improving their care is also matter of state and

federal concern as well. Reimbursement structures and legislation should be crafted that addresses the unique healthcare needs of patients with psychotic disorders and others with mental illness. These individuals may require complex care, coordinating between a wide variety of medical and psychiatric services. Reimbursement could potentially be tied to meeting best-practice standards that demonstrate efforts to coordinate care and deliver recommended assessments and treatments that appear to be less common for these patients.

Research Implications

This research generates important information about non-psychiatric hospitalizations for individuals with psychotic disorders but also demonstrated that much remains unknown about their health and hospital outcomes. First, future research should focus on identifying individuals who are the highest risk for poor outcomes like readmission, longer length-of-stay and readmissions. The lower r^2 of the quantitative model indicates that there are other factors that could be used to create more effective remains unexplained. It is likely that there are sub-populations within this larger group that are at highest risk for poor outcomes. Further quantitative modeling should be done to identify these groups, whether they be persons who have undergone specific processes or diagnostic categories, so that their specific needs can be identified and understood.

Once these sub-populations are fully identified, interventions to address poor hospital outcomes should be developed or adapted to their specific needs. While programs like the Transitional Care Model (Naylor et al., 1994) have been shown to improve hospital outcomes, especially readmissions (Jackson et al., 2013), adaptations

for similar groups only exist for psychiatric care transitions and only for adults with serious mental illness (Solomon, Hanrahan, Hurford, DeCesaris, & Josey, 2014). The effectiveness of these interventions for patients with psychotic disorders when discharged from non-psychiatric settings remains unknown. It is likely that some level of intervention tailoring will need to occur and that more information around patient needs is necessary to successfully adapt these interventions.

Patients with a psychotic disorder, while vulnerable, were shown to be knowledgeable about their own health and hospitalization in this study. These patients want to be active participants in the process and can be a valuable source of information. By allowing these individuals voices to be heard, more can be learned, and healthcare providers can deliver more acceptable and effective patient care. Further research should be conducted in the future about these patients' experiences with other aspects of the healthcare system, especially if it can be paired with the perspectives of providers themselves, to more fully understand non-psychiatric care of people with psychotic disorders.

Conclusion

This mixed methods, exploratory sequential study examined the experiences of patients with psychotic disorders hospitalized in non-psychiatric settings. Through qualitative interviews, patients contributed important information about their experiences and needs during medical-surgical hospitalizations. Overall, they reported both positive and negative interactions with providers, as they struggled to obtain the health education that they felt they needed and manage their complex medical and psychiatric conditions.

These interviews also served as the foundation for variable selection that was used to develop a quantitative model. This analysis showed that certain patient characteristics and processes of care were associated with these patients' length-of-stay in the hospital. By investigating non-psychiatric hospitalizations of these patients through this mixed methods approach, a more holistic understanding of their hospitalizations was possible and the process of creating effective interventions to reduce their poor hospital outcomes can begin.

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