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Reducing Readmission Rates Among Patients Who Have a Dual Diagnosis of Both Mental and Physical illnesses

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ABSTRACT

Readmission rates are a primary indicator used by acute care hospitals to determine the effectiveness of healthcare treatments and interventions. High readmission rates indicate the existence of a gap in the continuum of care. Acute care hospitals focus on the treatment of the immediately urgent physical health condition. Once the immediate presenting illness is treated or stabilized, the patient is discharged. This focus largely leaves mental illness undiagnosed and untreated. However, chronic, untreated mental illnesses are often comorbid with physical illnesses. In studies comparing patients with comorbid physical and mental illness to patients with only a physical illness, comorbidity was associated with increased 30-day readmission rates. Integrated mental healthcare in acute care hospitals is likely one solution to this national problem. This research study analyzed secondary data over readmission rates within a rural Texas hospital system. A data set consisting of 1,421 total readmission cases was gathered from June 2022 to December 2022. Results showed that there are a significant number of preventable readmissions, and an improvement of integrated healthcare could help to reduce these readmissions and improve the quality of care that patients are currently receiving. It was found that although hospital administration heavily analyzes readmissions and the potential causes of them, there is very little focus on patients' mental health diagnoses. With better prioritization on these mental health diagnoses and proper mental health intervention, many of these readmissions could be reduced.

Reducing Readmission Rates Among Patients Who Have a Dual Diagnosis of Both
Mental and Physical illnesses

A Thesis

Presented to

The faculty of The School of Social Work

Abilene Christian University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science

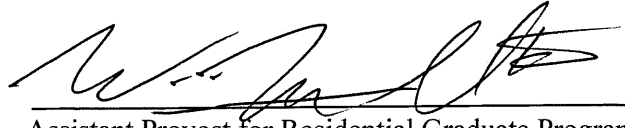
By

Hannah M. Shahan

May 2023

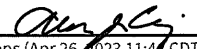
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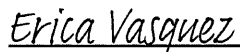

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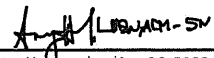
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CHAPTER I

INTRODUCTION

Mental health disorders often go unacknowledged and untreated when accompanied by physical health conditions. Acute care hospitals normally focus on treatment of physical illnesses and conditions with a goal of providing efficient care for the presenting problem. Efficiency normally means that the presenting problem is addressed quickly, the patient is stabilized, and the patient is discharged within a matter of days. Typically, a patient is given a discharge plan for follow-up care that may include referral to a specialized facility (e.g., long-term care) or to a primary care physician.

Physical and mental illnesses are often co-occurring (i.e., comorbid) and this type of comorbidity often complicates discharge planning and follow-up care. Communities often lack adequate resources for treatment of psychiatric illness, and acute care hospitals are often unaware of, or choose not to attempt treatment of, psychiatric illness.

Unfortunately, untreated psychiatric illness is often associated with chronic physical illnesses and is also associated with readmission to acute care hospitals. Major depressive disorder for example, is a psychiatric illness that is often comorbid with physical health conditions (e.g., high blood pressure, or diabetes). These chronic psychiatric conditions are difficult to diagnose and treat; however, such diagnosis and treatment could help to reduce readmission rates.

When mental health conditions are untreated, they often become much bigger issues. This often causes patients' symptoms to worsen and can even cause periods of suicidal ideation. Borecky et al. (2019) report:

It is estimated that one-third of the general (nonclinical) population have suicidal thoughts at some point in their lives and more than eight million U.S. adults report serious suicidality in the past year; what's more, 2.5 million people report making a suicide plan in the past year, and 1.1 million report a suicide attempt in the past year. (p. 72)

This is just one example of the life-long effects comorbidities have on people and is one of the many reasons why this group of individuals poses such a high risk of being frequently hospitalized.

Readmission rates are a primary indicator used by acute care facilities to determine the effectiveness of treatments and interventions utilized during a patient's hospital stay. High readmission rates indicate that the current programs and interventions are not serving the patients adequately; therefore, patients are often readmitted to the hospital within 30 days of being discharged. Large numbers of patients readmitted to hospitals within a short time frame may indicate poor quality hospital care or inappropriate post-discharge care coordination (Reif et al., 2017).

Federal and state policies use readmission rates to indicate poorer quality healthcare. As a result of the Affordable Care Act (ACA), re-hospitalization following acute care is now a key indicator of costly, suboptimal and poorly coordinated health care (Hanrahan et al., 2016). With this in mind, acute care hospitals must pay careful attention to readmission rates and work diligently to reduce them because they are often quite

costly to the patients and the hospital. Ahmedani et al. (2015) reported that, in the United States (US), over \$17 billion of Medicare expenditures are annually attributed to hospital readmissions.

Considering comorbidities and the consequential impact they have on patients diagnosed with them, the primary aim of this thesis is to evaluate associations between comorbid diagnoses and readmission rates within a local healthcare setting. A better understanding of this association will help to provide new suggestions for potential solutions as they relate to social work practice. Literature shows both direct and indirect correlations between the existence of a dual diagnoses of a mental and a physical illness (i.e., comorbidity), and readmission rates (Sprah et al., 2017).

The main themes that attempt to explain this correlation include: a lack of access to affordable and effective mental health, mental illness (MHMI) services; a lack of knowledge about evidence based MHMI interventions among acute care hospital providers; a lack of education about MHMI among the healthcare employees (such as nurses, nurse aids and physicians) within these acute hospitals; and a significant financial burden that readmissions cause both patients and hospitals. As Goh et al. (2016) eloquently summarize:

International evidence indicates that people with severe mental illness have a lower standard of physical health than the general population, leading to higher mortality and morbidity rates. Medical comorbidity and mortality disproportionately affect adults with serious mental illness as compared with the general population, with reports of over 90% of psychiatric patients having chronic medical disorders. (p. 12)

CHAPTER II

REVIEW OF LITERATURE

Twenty-seven pieces of literature were found for the purpose of this review within the EBSCO database search interface through the Abilene Christian University online library and the PubMed database within the National Library of Medicine. Qualitative and quantitative studies, along with retrospective studies, and other systematic reviews over readmission rates were reviewed across the United States. Those under the age of 18 were specifically excluded from the search criteria as this review's primary focus is on adults at least 18 years old. The age range of the literature was found to be between 18 and 65 and the population had no specific gender criteria. The period of dates of each of these sources ranged from 2006 to 2022.

Purpose

The purpose of this literature review is to explore the current issues Americans experience with having MHMI comorbidities that lead to readmission within acute general healthcare settings. This review will also shed light on comorbidity-related treatment barriers that remain within the U.S healthcare system. Integrated mental healthcare in acute care hospitals is likely one solution to this problem that can benefit hospitals and patients by simultaneously addressing chronic mental and physical health conditions. To properly understand the impact these comorbidities have on patients, it is

vital to understand what these particular comorbidities are and how they are currently being treated.

Hospitalization Rates

Before diving into the problem of readmissions, it is worth noting that hospitalization rates, in general, are something that healthcare systems work to lower. However, the way that the current American healthcare system is set up, there are little to no preventative measures in place to prevent people from being hospitalized. As Goldman et al. (2020) stated,

Approximately 3.3% of American adults with any mental illness are hospitalized annually, including 7.3% of adults with serious mental illnesses. As many as 84.2% of hospital stays for mental and substance use disorders already address at least one co-occurring physical health condition. (p. 17)

Because there are no preventative measures in place, these hospitals are forced to attempt to “fix” the problem *after* it has already occurred rather than being able to prevent it from happening in the first place.

Stahler et al. (2009) reported that one of the main problems with readmission rates is that discharge planners rarely take into account the patients’ environmental factors, which have a significant impact on the patient. Stahler points out that patients are often influenced by their environment, affecting their daily behavior. A patient’s environment drastically shapes them as a person, and if that environment is not meeting the patient’s needs, it will have significant negative repercussions. This is a vital factor for medical social workers to be aware of and must be addressed while the patient is in the hospital. Social workers are typically the primary discharge planners.

Key Terms

Two key terms were presented as literature was reviewed: *readmissions* and *comorbidities*. To fully understand the problem, it is crucial to first grasp these two terms and why they are important. Readmissions represent patients who are rehospitalized, typically measured within 30 days. Comorbidities represent the two (or more) diagnoses a patient has. These can be either mental disorders, physical health conditions, or a combination of the two. It is essential to keep these in mind throughout this review, as they represent the two main parts of the study.

Readmissions

Benjenk and Chen (2018) defined a *readmission* as “an unplanned, inpatient admission, for any condition, within thirty days of discharge from the initial admission.” (p. 2). Thirty-day periods are most often used to measure readmission rates within acute care. According to the Centers for Medicare & Medicaid Services (CMS), the 30-day period is a clinically meaningful timeframe for hospitals to reduce readmission risk in collaboration with their medical communities when finalizing the three 3 readmission measures (Black, 2014). CMS is the largest insurance provider in the United States, as it controls Medicare and Medicaid (as well as other insurance companies). Because CMS is the primary source of income for hospitals around America, their rules and procedures drastically impact how hospitals are run and how acute care facilities implement their own policies.

Readmissions are often preventable, and rates could be significantly decreased with the proper interventions. After researching the discharges and readmissions of patients at a local hospital in Boston, Massachusetts, Donze et al. (2013) found that

22.3% of all admitted patients were rehospitalized within 30 days. Out of those 2,398 patients, 858 of those admissions were found to be potentially avoidable or preventable. After a review of patients readmitted to an acute care facility in Florida, Becker et al. (2017) found that, “About one in five hospitalizations ($N = 314,742$, 18.6%) resulted in the person being rehospitalized within 30 days for a non-behavioral health condition” (p. 5). These are two examples of how previous data have shown that there is a way to potentially prevent readmissions and that this is achievable with the right tools and resources.

Comorbidities

The primary component of high readmission rates is the comorbidities with which patients are diagnosed, as these have been shown to put patients at a higher risk for being rehospitalized. Although many theorists and researchers have different definitions for *comorbidity*, the term is most often characterized as “The presence of more than 1 distinct condition in an individual” (Valderas et al., 2009, p. 358). Miller et al. (2006) report that among the patients in their study, the leading medical comorbidities were hypertension, obesity, diabetes, or COPD. These physical diagnoses are quite common in the medical field and can occur alongside just about any other medical condition. When hospital committees review readmissions, it is often found that those most at risk for being readmitted are patients who suffer from these comorbidities (sometimes called *dual diagnoses*). In psychiatric hospital settings, it is quite common that patients with mental illnesses also have comorbidities. Roick et al. (2022) found that the most common comorbid diagnoses were adjustment disorder, major depression, and alcohol use disorder (otherwise specified as alcohol dependence). Roick et al. (2022) point out that this is a

common finding and many other studies have highlighted similar rates of the same psychiatric comorbidities.

Currently, little attention has been paid to comorbidities that are often a combination of physical and mental illnesses rather than simply a physical condition or mental disorder alone. As a result of this specific comorbidity, this particular group of patients is at a higher risk, resulting in a higher readmission rate. The likelihood of patients with comorbid mental illnesses being readmitted to the hospital within thirty days is 28% higher than that of those without mental illnesses when they are hospitalized for physical health conditions (Benjenk & Chen, 2018). These comorbidities typically include disorders or symptoms that are not as severe but are only significantly worse when accompanied by another condition. A prime example of this is a patient experiencing high amounts of stress. Edmondson et al. (2014) found that patients with higher stress scores had significantly more comorbid diagnoses than did those with lower stress scores. Edmondson et al. also found that higher stress scores increased the number of patients that were depressed. Stress, like many other conditions, is one that is acute and can often be managed on its own and typically subsides after the stressful event is over. However, when a chronic health condition is involved and that stress is caused because of the particular physical condition, that stress then often becomes chronic and causes more anxiety and mental distress for the patient.

Themes

Many themes have emerged from reviewing this literature. Finances remain a significant burden to patients who are readmitted to the hospital, and there are numerous financial consequences for the hospital. Insurance companies hold considerable influence

in healthcare systems and have significant effects on hospitals and patients. A lack of integrated mental healthcare has significantly decreased adequate treatment provided to patients who suffer from mental health disorders. An overall lack of access to proper healthcare persists for many who reside in more rural areas, and even in Abilene, due to the lack of facilities and treatment currently available. A lack of education among hospital staff members causes even further issues for patients who suffer from multiple physical and mental diagnoses. This lack of education, such as stigma, is easily recognizable to other staff members and patients.

Financial Burden

The number one barrier for patients with comorbidities is the financial burden they cause the patient. Šprah et al. (2017) delve into this issue and explain that comorbidities are most often linked with higher economic burdens, due to the increased direct and indirect health costs. Direct health costs are most evident and typically include inpatient hospital stays, outpatient medical visits and pharmaceutical services. An example that best describes indirect health costs is the expenses caused by a patient not being able to work consistently because of their illness and therefore losing their income.

The main reason readmissions are so heavily prioritized within healthcare is the financial burden that high readmissions cause for hospitals. In a 2017 study, Marion Becker and his team of researchers completed a review of risk factors associated with early rehospitalization. They noted, “Hospital expenditures account for approximately one third of total national health care spending. Early rehospitalization (i.e., within 30 days of discharge from an initial hospitalization) is reported to occur in 18 to 25% of hospitalizations” (Becker et al., 2017, p. 2). The financial penalization that insurance

companies create for hospitals based on their readmission rates remains the driving force of change. Rubin and Shah (2021) report that readmissions are a “significant driver of healthcare costs and a marker for healthcare quality. Hospitals in the USA have been subject to financial penalties for excess readmission rates under the Hospital Readmissions Reduction Program since October of 2012” (p. 1).

Kripalani et al. (2014) report that an estimated \$17.4 billion is spent annually by Medicare alone to treat readmissions to the health care system. The cost of readmissions to the healthcare system is substantial, accounting for an estimated \$17.4 billion in spending annually by Medicare alone. In the Affordable Care Act, the Hospital Readmissions Reduction Program (HRRP) authorized Medicare to reduce payments to hospitals with excess readmissions. Because insurance coverage is often based primarily off of the diagnosis a patient has, much of Medicare’s costs are allocated for patients who suffer from comorbidities. With the number of chronic conditions increasing exponentially, Medicare spends 80% of its resources on patients with four or more chronic conditions (Šprah et al., 2017). Jeanne Black (2014) reported similar spending trends with Medicaid and pointed out that the research found that year reported that patients with Medicaid were among the majority of patients who are frequently rehospitalized.

Lack of Interventions

The most prevalent issue currently not being addressed is an overall lack of mental health intervention in acute care settings. This causes several gaps in care and is a primary example of the necessity for adequate integrated mental health services. One of the details noted by Nielsen and Klein (2009) was the long wait times experienced by

patients in the emergency room. In this study, patients often waited around three hours, but sometimes much longer, to see a health professional. Long wait times in the emergency room are a burden to anyone seeking emergency medical attention but can be detrimental to those experiencing a mental health crisis. This is a burden that is often addressed by hospital staff but is particularly difficult to solve, as most wait times are the consequence of low staffing or the prioritization of more urgent medical emergencies.

The current lack of interventions has a substantial impact on the patient in more long-term ways than most first recognize. For example, Reif et al. (2017) explain that along with their study, there have been several others that have shown poorer treatment leading to substance abuse and other poor coping mechanisms. This is one example of many that describe the long-term effects this gap has on patients who are readmitted to acute care facilities. Further issues arise when certain symptoms are not adequately treated, which exacerbates the comorbidity and causes a poorer quality of life for the patient. This has also been known to shorten the life expectancy of those with comorbidities that involve mental disorders. Goldman et al. (2020) note:

Premature mortality is significantly higher for people with any mental illness compared to the general population [1], with even earlier mortality for those with serious mental illnesses such as schizophrenia [2], bipolar disorder [3], and severe depression [4]. Shortened life expectancy in people with mental disorders has been primarily attributed to common medical comorbidities such as cardiovascular disease and cancer. (p. 16)

Length of Stay

A patient's length of stay (LOS) is the number of total days they are in the hospital. A patient's LOS depends entirely on the severity of their condition and the treatment available. The patients' LOS is vital for insurance companies, as they are in a position to decide how to allocate patients' funds to cover their hospital bills. LOS also further impacts what services they are eligible to receive post-discharge. Insurance coverage affects home health, therapy at a skilled nursing facility or inpatient rehabilitation hospital, and many other post-discharge services. Patients who have severe comorbidity, specifically a chronic mental disorder, are far more likely to have a higher length of stay than patients who have only a single physical diagnosis. "People with psychosis, major depression, bipolar disorder, and alcohol use disorder had an increased LOS. Those with bipolar disorder had the greatest increased LOS (1.34 additional days). The extra cost of hospitalization for these patients ranged from US\$1,843 to US\$7,763." (Mather et al., 2014, p. 83). This particular research points out how the increased length of stay significantly increases a patient's hospital bill. This detail is important to remember, as many patients, unfortunately, do not have any medical insurance and are then forced to pay their hospital bills out of pocket.

Lack of Access

An issue that must be addressed when discussing barriers patients frequently face is the lack of access many patients experience. "Compared with the wider population, people with mental health problems also face difficulties accessing treatment for physical health, resulting in three times the utilization of hospital treatment" (Foye et al., 2020, p. 407). This subgroup of patients often also faces further barriers, such as a lack of

transportation or financial issues, which make it even more difficult for them to access the help they need. Socioeconomic variables such as unemployment also have significantly higher rates of psychiatric comorbidities (Roick et al., 2022). Regarding more rural areas, it is important to recognize that even if these economic factors are not a barrier, it is common that there are no facilities available to care for and properly treat both conditions. Because of specialized treatment that may be necessary for one condition or the other or the lack of staff in that field, many dually diagnosed patients are excluded from care in either system. These patients then inappropriately use services such as emergency departments because they do not have access to the appropriate services (Ouimette et al., 2007).

Lack of Education

Uneducated Hospital Staff

Another notable barrier to adequate care is the staff members, such as nurses and physicians, who remain somewhat uneducated on mental health disorders and how they negatively affect the co-occurring physical condition. Many healthcare workers who are adequately educated on the subject have even pointed out that it is quite obvious when this is the case, and it is evident when staff members become ignorant to the patient's mental health concerns. Foye et al. (2020) state:

Some staff with training or experience working with mental health problems reported that they felt that mental health issues were either invisible to general ward staff or it was not seen as part of their job. These factors led to staff becoming disconnected from engaging with patients who presented with a mental health problem. (p. 411)

When healthcare professionals have this lack of understanding and knowledge, they often become more irritated with the patients they are treating, as they are likely unsure of how to properly treat and care for them. Giandinoto and Edward (2014) reported after a systematic review that hospital staff became angry and frustrated, and this seemed to stem from “knowledge gaps or skill deficits,” which created further barriers to providing adequate care for the mental illness symptoms the patient was facing.

Stigma

One cultural barrier that many communities face is the stigma in which hospital staff hold. Wainberg et al. (2017) explain how social exclusion, which is grounded on stigmatized ideas, further lead to poor recovery and often lowers quality of life. This stigma also prevents many from seeking help, which just delays care and worsens the patient’s prognosis. These factors “perpetuate the misperception that mental illnesses are beyond cure” (Wainberg et al., 2017, p. 5). As social workers, stigma is a known barrier to almost every marginalized group of people in the U.S. It is the ethical responsibility of the social worker to acknowledge and address the current stigma facing the patient, and to work tirelessly to reduce it within the hospital as well as within the community.

Conclusion

This literature review has described many barriers affecting patients with comorbidities and has examined ways that current healthcare procedures are not adequately treating those with both mental and physical diagnoses. Despite these numerous articles and many other works that describe similar data and findings, it is notable that not enough is currently being done to improve these issues. Efforts have been made over the past couple of decades to reduce readmissions by identifying what groups

of patients pose a higher risk of being readmitted to the hospital. Nonetheless, there have been inconsistent findings and therefore further research is necessary to bring about any change (Zhou et al., 2022). Medical social workers have the ethical responsibility to their patients to help provide any resource or assistance they can to patients who have these higher risks. Although there are certain tools and policies currently implemented in acute care facilities to address high readmissions and the burdens they cause hospitals, there are a limited number of social interventions currently being utilized to address the patients' burden and long-term effects readmissions have on them.

This study will draw on existing data to examine how prevalent comorbid MHMI and physical illness diagnoses are within this medium-sized private hospital.

Additionally, the study will examine the rate at which comorbidity of MHMI and physical illness coincide with readmission to the hospital within 30 days of discharge.

This review will also provide more details as to what hospital staff and medical social workers can do to help reduce readmission rates and to improve the current barriers and gaps that exist in acute healthcare.

CHAPTER III

METHODOLOGY

Purpose

The purpose of this study is to determine whether a statistically significant relationship exists between readmission rates at an acute care hospital and the psychiatric diagnoses that are comorbidly associated with a physical disease or disorder. As indicated in the literature, comorbidity of physical illness and mental disorders are hypothesized to significantly covary with readmission rates. This variation will be the primary focus of the secondary analysis and the data will aim to answer the question of research at hand. This study will test this hypothesis and will utilize its findings to better explain how case managers and social workers can improve discharge planning interventions to appropriately treat patients with these comorbidities.

Research Design

A secondary data sample was collected over all patients who had been readmitted to the hospital within a single 30-day period from June of 2022 to December of 2022. These data were de-identified using Safe Harbor methods to adequately comply with all HIPAA regulations and policies in order to protect all patients' identities within the reports. The data obtained included primary or initial diagnoses of each patient, the length of stay (LOS) of the patient's admission, and the number of days between the initial discharge date and the readmission date. The days between the discharge and readmission date will serve as a code for de-identifying the patient's personal

information. This data aimed to show some correlation between physical and mental diagnoses and whether patients with these kinds of dual diagnoses are readmitted at a higher rate than those with one single physical diagnosis. The sample size consisted of 1,421 total cases, representing the total number of readmissions between two hospital campuses. One campus had a total of 1,080 readmission cases, and the second had 341 cases. It is also important to note that there is likely some amount of overlap, as there are some patients who were likely readmitted more than once in the six-month period that the data was retrieved. Exclusion criteria included patients under the age of 18, and hospital units that were not applicable to this study, such as Labor and Delivery and Mother Care.

Data Collection

The researcher acquired all data from the research and bioethics departments at the hospital. The large data set was then imported into IBM SPSS computer software to further evaluate the readmission scores. The researcher and thesis chair also checked for missing values, outliers, and errors in the data. The initial and the readmission diagnoses, for each case, were coded to indicate to which of these categories the respective diagnosis belonged. Tables were used to visually represent the data and identify frequencies of each of the categories. Seven diagnosis categories were highlighted among each of the diagnoses, including respiratory diseases, cardiovascular diseases, endocrine diseases, kidney diseases, digestive diseases, infectious diseases, and cancer. Two outliers that were found among the diagnoses were “other” and “multiple categories.” These two outliers have a significant impact on the data set and frequencies of each diagnosis that were analyzed.

ChatGPT Search

For further inquiry on the research that has been completed over each diagnosis category, the ChatGPT artificial intelligence tool was used. These diagnostic categories included those identified in the literature as being frequently comorbid with medical illnesses. Diagnostic categories included respiratory diseases, cardiovascular diseases, endocrine diseases, kidney diseases, digestive diseases, infectious diseases, and cancer. A simple question was input asking how much evidence exists for each category showing the likelihood of a comorbid mental health condition. For example, the search “How much evidence exists showing that respiratory diseases have a comorbid mental health diagnosis?” yielded results explaining that only *some evidence* has been found to show that patients diagnosed with a respiratory disease also have a mental health diagnosis. This search provided insight on how much evidence supports each diagnosis being associated with a comorbid mental illness.

Data Analysis

IBM SPSS 28 computer software was used for data manipulation, storage, and analysis. The Tables menu option was used to construct tables showing frequencies and descriptive statistics. The recode into new variables algorithm was used to search for strings within the initial diagnosis and readmission diagnosis variables to create a new categorical variable to associate each case with a particular diagnostic category. For example, a search of the initial diagnosis variable for the string “cancer or carcinoma or sarcoma or malignant” might have been assigned a value between 1 and 9, which was given the label “cancer.”

Ethical Considerations

To minimize the introduction of bias and error into the review process, literature was gathered from diverse sources specific to healthcare and medicine. As with any protected class of individuals, there are always risks that are involved in medical research. Because this study utilized secondary data that had previously been collected within the six-month period, there was no interaction between the primary investigator and the patients; therefore, the risk of potential harm is significantly decreased. The confidentiality of each of the patients were held, as the identities of each remained completely anonymous. The researcher received all data from hospital employees in the research and bioethics department.

CHAPTER IV

FINDINGS

Each of the following tables represents specific parts of the data set, helping to show the correlation between each diagnosis and how many patients labeled under each diagnosis category were readmitted to the hospital. The tables include days to readmission for both their initial diagnosis and their readmission diagnosis, the frequencies in which each diagnosis category was readmitted, and a scale of evidence comparing each diagnosis category to the comorbidity of mental health diagnoses.

Days To Readmission by Initial Diagnosis Category

Table 1 represents the number of days between hospitalizations of each patient's primary diagnosis. "Count" represents the number of patients who have a primary diagnosis that falls under that particular diagnosis category. For example, 121 patients had a respiratory disease diagnosis. As shown in the table, the median number of days to readmission for infectious, respiratory and kidney diagnosis categories is 12, meaning that with these three diagnoses, there was a median of 12 days to readmission. The maximum number for each diagnosis is 30, representing the 30-day period of readmissions. It is important to note that "other" could represent many different diagnoses, and the vague documentation within the data set could have skewed the data.

Table 1*Days To Readmission by Initial Diagnosis Category*

Diagnosis Category	Count	Median	95.0% Lower CL	95.0% Upper CL	Minimum	Maximum
Other	592	11	10	13	0	30
Respiratory	121	12	10	15	0	30
Cardiovascular	183	11	9	14	0	30
Endocrine	57	13	9	17	0	30
Kidney	51	12	9	19	1	30
Cancer	57	8	7	11	0	29
Digestive	102	11	10	13	1	29
Infectious	177	12	11	15	0	30
Multiple Categories	82	15	11	18	0	30

Days To Readmission by Readmission Diagnosis Category

Table 2 represents the days between hospitalizations by the readmission diagnoses. This table is important to consider, because a number of patients who were readmitted to the hospital had a different primary diagnosis than the hospital admission in which they were initially admitted. As shown in the table below, the median number of days to readmission by the patients' readmission diagnoses varies slightly in comparison with the initial diagnoses, which were represented in Table 1. For example, patients with a respiratory disease diagnosis had a median number of days to readmission of 11, which varied slightly from the initial diagnosis median of 12. Likewise, kidney disease diagnosis changed from 12 days to 9 days, and cancer changed from 8 days to 10 days. Moreover, patients had a different primary diagnosis when they were readmitted, than when they were initially admitted.

Table 2*Days To Readmission by Readmission Diagnosis Category*

Diagnosis Category	Count	Median	95.0%		Minimum	Maximum
			Lower CL	Upper CL		
Other	581	11	10	13	0	30
Respiratory	120	11	9	15	0	30
Cardiovascular	164	12	9	13	0	30
Endocrine	52	12	10	17	2	30
Kidney	52	9	6	15	1	28
Cancer	29	10	6	17	0	26
Digestive	80	11	8	15	0	30
Infectious	232	12	11	14	0	30
Multiple Categories	112	13	11	17	1	30

Frequencies of Initial Diagnoses by Diagnosis Category

Table 3 represents the frequencies measured of each diagnosis category previously discussed in Table 1 and Table 2. As shown in the table, the “*n*” column represents the number of readmission cases labeled with the particular primary diagnosis (i.e., respiratory disease—131 patients). The “Percent” column represents the percentage of readmissions among that particular diagnosis (i.e., respiratory disease—14.40%) in comparison to the “Percent of Cases” column, which represents the readmission rate for all cases. (i.e., respiratory disease—15.80%). These percentages all differ slightly, meaning that comorbid diagnoses likely exist.

Table 3*Frequencies of Initial Diagnoses by Diagnosis Category*

Initial Diagnosis Category	<i>n</i>	Percent	Percent of Cases
Respiratory Disease	131	14.40%	15.80%
Cardiovascular Disease	238	26.10%	28.70%
Endocrine Disease	64	7.00%	7.70%
Kidney Disease	103	11.30%	12.40%
Cancer	64	7.00%	7.70%
Digestive System Disease	122	13.40%	14.70%
Infectious Diseases	190	20.80%	22.90%
Total	912	100.00%	109.9% ^a

^aSome cases were classified into two categories

Frequencies of Readmission Diagnoses by Diagnosis Category

Table 4 represents the frequencies of readmissions by the labeled readmission diagnosis. Each diagnosis category is measured in a similar manner as Table 3, representing the frequencies of each readmission diagnosis category in comparison to the entire data set. Just as the previous table, Table 4 helps to show that a comorbid diagnosis likely exists, as the percent of total cases varies from the percent of diagnoses.

Table 4*Frequencies of Readmission Diagnoses by Diagnosis Category*

Readmission Diagnosis Category	<i>n</i>	Percent	Percent of Cases
Respiratory Disease	133	13.90%	15.80%
Cardiovascular Disease	248	26.00%	29.50%
Endocrine Disease	56	5.90%	6.70%
Kidney Disease	131	13.70%	15.60%
Cancer	38	4.00%	4.50%
Digestive System Disease	102	10.70%	12.10%
Infectious Diseases	247	25.90%	29.40%
Total	955	100.00%	113.6% ^a

^aSome cases were classified into two categories

ChatGPT Responses

Respiratory Diseases

ChatGPT suggests that there is *some evidence* to suggest that individuals diagnosed with respiratory diseases may have a higher risk of also experiencing mental health conditions (OpenAI, 2023). In a study conducted over the association of mental illnesses and respiratory diseases it was found that mental health conditions were associated with worse respiratory outcomes and were often long-standing (Hunter et al, 2021). While more research is needed to fully understand the relationship between respiratory diseases and mental health conditions, these studies suggest that there may be a significant link between the two. It is important for healthcare providers to be aware of this potential comorbidity and provide comprehensive care for individuals with respiratory diseases, including addressing any mental health concerns.

Cardiovascular Diseases

According to ChatGPT, there is *significant evidence* showing that cardiovascular diseases (CVDs) are associated with mental health comorbidities (OpenAI, 2023). Studies have found that people with CVD are at an increased risk of developing depression, anxiety disorders, and other mental health conditions. According to the American Heart Association, depression affects about 1 in 3 heart disease patients, and people with depression are four times more likely to develop CVD than those without depression (Kwapong et al., 2023). Furthermore, anxiety disorders have been linked to a higher risk of developing hypertension, heart disease, and stroke (Celano et al., 2016). The relationship between CVD and mental illness is thought to be bidirectional, meaning that having a mental health condition can increase the risk of developing CVD, and

having CVD can worsen mental health. Therefore, addressing both the physical and mental health needs of individuals with CVD is crucial for optimal overall health outcomes.

Endocrine Diseases

ChatGPT reports that there is *significant evidence* to suggest that people diagnosed with endocrine diseases are at an increased risk of having comorbid mental illnesses (OpenAI, 2023). Endocrine disorders affect the production and regulation of hormones in the body, which can have significant effects on mood, behavior, and cognition. For example, studies have found that individuals with thyroid disorders are at an increased risk of developing depression and anxiety disorders (Bathla et al., 2016). Similarly, individuals with diabetes have been found to have a higher prevalence of depression, anxiety, and other mental health disorders (Bădescu et al., 2016). In addition, disorders such as polycystic ovary syndrome (PCOS), which affect the reproductive hormones, have also been linked to an increased risk of depression and anxiety (Sadeeqa et al., 2018). Overall, the relationship between endocrine disorders and mental health is complex and multifaceted, and further research is needed to fully understand the mechanisms behind this association.

Cancer

ChatGPT reports that there is *evidence* to suggest that individuals diagnosed with cancer may have a higher likelihood of also having a comorbid mental illness, such as depression or anxiety (OpenAI, 2023). The relationship between cancer and mental health can be complex, as a cancer diagnosis can be emotionally distressing and may cause significant changes in a person's life. Additionally, some cancer treatments, such as

chemotherapy, can cause side effects that may affect a person's mental health (Smith, 2015). It's important to note that having a mental illness does not cause cancer, nor does having cancer cause a mental illness. However, the presence of a comorbid mental illness can impact a person's overall well-being and quality of life and may require additional support and treatment.

Kidney Diseases

ChatGPT reports that there is *evidence* to suggest that individuals with kidney disease may have a higher risk of developing comorbid mental health conditions (OpenAI, 2023). This is likely because kidney disease is a chronic illness that can cause a great deal of physical and emotional stress. Research has shown that individuals with chronic kidney disease are more likely to experience symptoms of depression and anxiety (Guerra et al., 2021). The ways kidney diseases and mental illness are related are not fully understood. This is another example of an acute or chronic illness that relates heavily to mental health conditions and likely requires more extensive treatment.

Digestive System Diseases

According to ChatGPT, there is *significant evidence* to suggest that there is a strong relationship between digestive system diseases and mental illness (OpenAI, 2023). Research studies have shown that people with digestive system diseases such as inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS) are more likely to also have a comorbid mental illness such as anxiety and depression. For example, stress and anxiety can exacerbate digestive symptoms, and chronic digestive conditions can lead to psychological distress (Person & Keefer, 2021).

Infectious Diseases

ChatGPT suggests that there is *evidence* that suggests a correlation between infectious diseases and mental illnesses (OpenAI, 2023). Research has shown that individuals with certain infectious diseases may experience coexisting mental health disorders, such as depression and anxiety. There is some evidence that suggests that severe infections, such as sepsis, may increase the risk of a p developing post-traumatic stress disorder (PTSD) (Calsavara et al., 2021). While some studies have found a correlation between these conditions, it is not always clear whether the infectious disease directly causes the mental illness or if there are other factors at play.

Each of these various responses help to show that evidence supports the hypothesis that mental health diagnoses are common among each diagnosis category and therefore, likely have an impact on the readmission cases presented. ChatGPT is an artificial intelligence (AI)-based long language model (LLM). ChatGPT was created in 2022 as part of Microsoft and has shown to be beneficial in analyzing large amounts of data and summarizing them, as well as extracting relevant information and presenting it in a structured format (Dahmen et al., 2023).

Evidence of Mental Health Comorbidity by Diagnosis Category

In Table 5, each diagnosis category is represented with a scale of evidence, based on how much evidence has been found to support the statement of each category being associated with a comorbid mental condition. The scale ranges from 0 to 3, 0 representing no evidence, to 3 representing a significant amount of evidence. This scale provides further insight into the hypothesis that certain diagnosis categories have higher rates of comorbid mental illnesses and shows that they could significantly impact the health and

well-being of a patient with such a diagnosis. For example, significant evidence has been found to show that a patient diagnosed with an endocrine disease will likely experience a comorbid mental health condition.

Table 5

Evidence of Mental Health Comorbidity by Diagnosis Category

Diagnosis Categories	Scale of Evidence (0-3)	Amount of Evidence
Respiratory Disease	1	Some evidence
Cardiovascular Disease	3	Significant evidence
Endocrine Disease	3	Significant evidence
Kidney Disease	2	Evidence
Cancer	2	Evidence
Digestive System Disease	3	Significant evidence
Infectious Diseases	2	Evidence

*Scale: 0- no evidence, 1-some evidence, 2-evidence, 3-significant evidence

Description of Sample

The sample in the dataset consists of a total of 1,421 cases. This implies that the dataset has been collected from 1,421 patients who were readmitted to the hospital within a 30-day period between June 2022 and December 2022. Data of this size provides a reasonable degree of confidence in the results that have been performed on the data.

CHAPTER V

DISCUSSION

Implications

Because the hospital data included no secondary diagnoses, and none of the primary diagnoses that were listed included mental health conditions, it is extremely difficult to decipher whether these readmission rates were truly affected by mental illnesses. The fact that these mental health conditions are not included in the data sets that have been widely used and analyzed by hospital administration, shows that mental health conditions are not prioritized or focused on. Although it significantly limits the research of this study, it is a major implication that further supports the notion that hospital administration and staff do not review patients' mental health diagnoses to the extent in which they should.

It is important to note that the relationship between physical diseases and mental illness is complex and can be influenced by many factors, including age, gender, socioeconomic status, and the severity of the particular disease. Furthermore, the direction of causality between physical disease and mental illness is not always clear, and it is possible that having a mental illness could also affect the symptoms and/or side effects of the physical illness. Many diagnoses that are listed under "Multiple Categories" have a binary relationship, and therefore likely affect one another, requiring more complex care.

Integrated healthcare is absolutely necessary for acute care hospitals to implement to further provide quality care. Kerrissey et al. (2017) describe integrated healthcare as “planned, thoughtful design of the care process for the benefit and protection of the patient.” The author considers patient care to be integrated when it is coordinated (across professionals, facilities, support systems, over time, between visits) and is tailored to patient and family needs. This type of care considers each of the patients diagnoses and potential needs, and coordinates with all members of the patients care team to provide high quality healthcare to each patient. By analyzing every aspect of the patients’ needs and care, hospitals can lower readmission rates and prevent unnecessary rehospitalizations.

Social Work Practice

As a social worker in the healthcare system, we should be providing integrated healthcare to all patients and should prioritize their mental health diagnoses, as they have been proven to be just as impactful as their physical diagnosis. Models of integrated healthcare have developed over the last few decades and have shifted the way that physicians and other healthcare professionals care for patients. The NASW calls social workers to implement this integration in practice. Social workers achieve this by being an advocate for clients’ rights to self-determination, confidentiality, access to supportive services and resources, and appropriate inclusion in decision making that affects their health and well-being (NASW, 2023).

There are many different models of integrated care, and although this care is most commonly utilized in healthcare, many areas of social work involve this integration. In regard to readmission rates and social workers’ role in reducing hospital readmission

rates, it would be best for social workers to implement “whole-system integration” (Goodwin, 2016). Utilizing this form of integrated care into medical social work is vital, as it would ensure that each patient’s care can be viewed in a more holistic way, incorporating all aspects of the patient’s medical care and treatment. Bronstein et al (2015) explains the impact that social workers have on a patient’s care and have proven to reduce readmission rates and risks.

Policies

Each hospital system has individual policies regarding the reduction of readmissions, and many are implemented because of federal policies implemented by CMS. These policies are important to take into account when reviewing the implications of readmission rates, as reduction programs are actively working to reduce these rates and look at ways that policies could be more effective for patients and staff. Under the Affordable Care Act, CMS implemented the Hospital Readmission Reduction Program (HRRP, 2023) which significantly impacts hospitals on a federal level and encourages facilities to improve their services where there are deficits to better engage patients and their caregivers. By improving these services where it is necessary, the HRRP aims to reduce preventable readmissions. Integrated healthcare has even impacted recent policy reforms within hospital systems and state governments (McCarthy, 2015).

Future Research

Further research is absolutely necessary to further understand comorbid mental illnesses and whether they have a significant impact on hospital readmission rates. As the data set has shown, mental health diagnoses are not being properly documented and are often not listed as a “primary diagnosis” and therefore do not get included on hospital

wide readmission rates. If each diagnosis was properly documented and included on the readmission tables that the administration reviews each month, there would be more accurate implications for future research and practice.

Limitations

The primary limitation to this study is that the data set provided does not include secondary diagnoses or mental health conditions. Without these diagnoses listed, there is no definitive answer to the original hypothesis that was posed. Another significant limitation to this study is that the diagnoses included are not clear on whether they are acute or chronic. Many conditions that are often chronic and uncontrolled are not listed as the patient's primary diagnosis, and an acute condition is listed on the data set instead. For example, one common chronic condition patients experience is COPD (Chronic Obstructive Pulmonary Disease), and patients often come into the hospital after experiencing an acute episode of this chronic illness. When this occurs, the primary or initial diagnosis is labeled as "Acute Respiratory Failure" (Naughton & Tuxon, 2014) rather than COPD. A possible explanation for this could be that the patient has not yet been diagnosed with COPD. This is just one example of many chronic illnesses that are documented in this way. This misinterpretation of diagnosis impacts readmission data significantly and can misrepresent a population of patients who are not receiving adequate treatment for their chronic illness.

Another limitation to this study is the diagnosis categories that are labeled as "Other." These diagnoses labels do not provide a clear explanation of diagnoses and could potentially represent mental health conditions if properly labeled. This label poses

many other questions about readmissions and the diagnoses of patients readmitted to the hospital.

Conclusion

Although the data set provided did not show a clear correlation between mental and physical illnesses and patients who are readmitted with both diagnoses, there are several conclusions that can be drawn with the readmission rates provided. Many patients that are represented in this data set could have had a preventable readmission, and with more research and improved integrated healthcare, it is possible that these readmission rates could be reduced.

The hospital could be saving money and reducing readmissions by addressing mental health problems during initial admissions. There are currently committees that focus on each diagnosis of readmission, such as diabetes and COPD, and each analyzes readmission data over patients admitted with such diagnosis. With the discoveries made in this study, it is vital that these readmission committees should be discussing comorbid mental illnesses in further depth and how they are impacting patients being readmitted to the hospital. Documentation within each patient chart needs improvement to further include mental health diagnoses, and readmission data sets such as this one could see drastic improvement in rates if administration focused more heavily on them.

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APPENDIX

IRB Approval Letter

Date: November 4, 2022

PI: Hannah Shahan

Department: 2027-School of Social Work, 20531-Masters in Social Work

Re: Initial - IRB-2022-40

Hospital Readmission Rates in Patients with Dual Diagnoses of Mental and Physical Illnesses

The Abilene Christian University Institutional Review Board has rendered the decision below for *Hospital Readmission Rates in Patients with Dual Diagnoses of Mental and Physical Illnesses*.

Decision: No Human Subjects Research

Research Notes: This is non-human research that can be exempt.

Additional Approvals/Instructions: This is non-human research that can be exempt.

Any modifications to the approved study must be submitted for review through Cayuse IRB. All approval letters and study documents are located within the Study Details in Cayuse IRB.

Sincerely,

Abilene Christian University Institutional Review Board