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Arizona's Mentally Ill and Their Use of the Emergency Department

Charlalynn Harris
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral dissertation by

Charlalynn Harris

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Review Committee
Dr. Jennifer Oliphant, Committee Chairperson, Public Health Faculty
Dr. Chester Jones, Committee Member, Public Health Faculty
Dr. Amy Thompson, University Reviewer, Public Health Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

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By

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MPH, Walden University, 2012

BS, Northern Arizona University, 2009

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health Epidemiology

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Abstract

Emergency departments (ED) are an integral component of the United States' health care system. The underlying factors related to ED use among Arizona's mentally ill are not fully understood and the patterns necessary to classify patients as frequent users have not been examined. The purpose of this study was to increase the understanding of frequent users and further examine the conditions by which they present to the ED. The theoretical foundation for this study was the fourth version of Andersen's behavioral model (1995) and this model's use to frame this study allowed for an objective analysis of ED use among Arizonans. The sample consisted of Arizona Department of Health Services-Department of Behavioral Services [AZDHS-DBS], ED discharge data, FY2013. The study addressed the gap in the literature using exploratory techniques and was guided by quantitative factor analysis. These multivariate techniques allowed for an analysis of the loading factors for each variable. The major findings from this study revealed a lack of generalizability based on a smaller than anticipated sample size; thus, halting further exploration within the sample for mental disorder, a key component to Research Question 1 and the overall study. Findings from Research Question 2 revealed the factors of race and payer as the best predictors of an ED visit. Study findings revealed ED visitors were most likely White females, 50 years of age or younger, and recipients of Medicaid. These study findings can inform clinical professionals within emergency medicine (EM) in the state of Arizona. This research has provided evidence that can be used by these professionals to promote positive social change and prompt additional primary research study efforts in healthcare utilization among Arizonans.

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Dedication

This study is dedicated to my former SMI patients residing in Pima County, Arizona.

Acknowledgments

I would like to first give thanks to God and my savior Jesus Christ. Additionally, I would like to thank my daughter Ashliegh-Cheyenne for being more than a wonderful daughter, but my dearest friend. Finally, a special thank you is extended to my fantastic Committee Chair, Dr. Jennifer Oliphant and Member, Dr. Chester Jones.

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Chapter 1: Introduction to the Study

Introduction

The burden of mental illness within the United States continues to grow (Agency for Healthcare Research Quality [AHRQ], 2012; Dora et al., 2015; Larkin et al., 2009). Paired with significant gaps in community-based psychiatric services, this burden is then placed upon emergency departments (ED) to serve as the primary and acute care providers for their mentally ill citizens (Brennan et al., 2014; Doran et al., 2014; Liu et al., 2013). An increased number of psychiatric patients with unmet needs find themselves passing through the doors of an ED each year (AHRQ, 2010). Since the year 2000, ED visits within the United States have grown from 93.1 million visits during 1998 to 129.5 visits in 2011 (Doran et al., 2015). Additionally, Americans with a mental health disorder rose from 19.3 million to 36 million between 1996 and 2006 (AHRQ, 2009). The diagnosis of psychiatric illness is second only to cardiovascular disease within the United States (Larkin et al., 2009).

Annually, one in three adults in the noninstitutionalized population has a diagnosable mental or addictive disorder (Kessler et al., 1994; Regier et al., 1993) and this prevalence increases to 40% among ED patients (Larkin et al., 2009). The presence of mental disorders is a rapidly growing component of emergency services (Bourdeaux, Clark, & Camargo, 2008; Larkin et al., 2005). During 2006, 4.7 million individuals with a primary psychiatric diagnosis (e.g., bipolar disorder, schizophrenia) presented to a United States ED at a rate of 20 visits per 100 adults (Downey, Zun, & Gonzales, 2009). Due to a steady increase in these trends, EM is faced with a two-fold duty to their

communities as a primary and acute mental health provider (Larkin et al., 2005; Larkin et al., 2008; Zink, 2006).

Five major classifications of disorders, mood, substance, anxiety, suicide, and psychoses, are responsible for nearly 80% of ED visits (Larkin et al., 2005). Additionally, patients presenting to an ED may have silent mental health issue(s) as well, which are likely to go undetected (Larkin et al., 2009). The actual numbers may be higher, as numerous ED visits are coded as an ill-defined condition or not recorded accurately as an anxiety or depressive symptom (Larkin et al., 2009). Furthermore, a patient presenting to the ED with a dual-diagnosis is not uncommon (for example, depression and substance abuse) (Doupe et al., 2012; La Calle et al, 2013; Liu et al., 2013; Minsky et al., 2011). Consequently, these patients are highly likely to be frequent visitors to an ED and very difficult to treat (Doupe et al., 2012; La Calle et al, 2013; Liu et al., 2013; Minsky et al., 2011).

I found no published studies examining the association among Arizona's mentally ill and frequent ED use. Published studies examining the predictors of an ED visit among the mentally ill universally note issues with unclear definitions of a frequent ED user (FEDU), mixed results and gaps within the literature (Benjamin, Burstin, & Brennan, 2003; La Calle & Rabin, 2010; Martin et al., 2013; Morgan et al., 2013; Owens et al., 2010; Pines et al, 2011; Scott, Strickland, Warner, & Dawson, 2014; Vandyk et al., 2013). Due to an increasing prevalence of mental disorders, utilization of emergency services, and the impact placed upon EDs, the generation of new research is an essential step to a more concise understanding of healthcare utilization severity and magnitude. Identifying the magnitude of any relationship among the predictors (enabling,

predisposing, and need) will be a rewarding first step in understanding the epidemiology of ED visits related to Arizonans with a mental disorder.

In Chapter 1, I provide background for the study, as well as a problem and purpose statement. I present the research questions and the nature of the study I proposed to address them. Finally, I discuss the theoretical model; assumptions, delimitations and limitations of the study; and study significance.

Background

Many developed nations have a national health system in place that is overseen by the government and funded through taxes (Shi & Singh, 2010). Most of its citizens are entitled to health care services such as routine and basic care (Shi & Singh, 2010). This form of health service is commonly known as universal care. Conversely, the health care system within the United States offers its citizens a unique form of care delivery and has no single, nationwide system of care (Ridic, Gleason, & Ridic, 2012). Americans are offered health insurance through a private marketplace or government sponsored options, available to certain individuals (Ridic et al., 2012). Medicare, overseen by the federal government, is the United States' largest public health insurer, covering approximately 13% of aged and disabled persons (Ridic et al., 2012). Health care within the United States faces significant challenges, including a substantial number of citizens without health coverage (Ridic et al., 2012). It is estimated that over 42 million Americans lack health care coverage (Ridic et al., 2012). Barriers to receiving care result in failed health needs, delayed receipt of necessary services, and the inability to receive preventative care (Healthy People 2020, 2015; Ridic et al., 2012). These conditions negatively impact

access and the utilization of health services, which increases the likelihood of poorer health outcomes and mortality (Healthy People 2020, 2015; Ridic et al., 2012).

During the mid-19th to mid-20th centuries, patients in the public psychiatric asylum system of care within the United States were primarily seen in institutions with financial assistance from state governments (Kovner & Jonas, 2010). Deinstitutionalization, or the release of tens of thousands of people from psychiatric care settings such as large state hospitals, has occurred over the past 30 years, greatly influencing the psychiatric care delivery system (D'Antonio, 2015). At its height in 1955, public psychiatric asylum care housed 559,000 patients (Kovner & Jonas, 2010). Presently, the number of Americans residing in state-supported psychiatric hospitals is less than 60,000 (Kovner & Jonas, 2010). At this time, less than 10% of state-supported public psychiatric beds and one of four psychiatric patient care events take place within the inpatient setting (D'Antonio, 2015). Over the past 15 years, individuals with mental illness have faced challenges in receiving treatment, frequently propelling them to seek care from the ED (Larkin et al., 2009).

By the start of the 20th Century, state governments oversaw care for the disadvantaged, including the mentally ill and those with behavioral disorders (Kovner & Knickman, 2011). However, during the 1960s, the United States government began funding community-based mental health services, while restricting inpatient psychiatric services (CMS, 2015). Since this time, state governments have discharged mentally ill patients from state facilities and diverted others from being admitted, leaving large numbers of individuals unable to find housing and appropriate treatment services within their community (Kovner & Knickman, 2011).

EDs are an integral component of care delivery within the United States (AHRQ, 2012). The ED provides a number of services to the community, from caring for those with acute illnesses and severe injuries, to providing walk-in services (Kovner & Jonas, 2010). Nearly 93% of hospitals within the United States have an ED (Kovner & Jonas, 2010). A study performed by Baillargeon et al. (2008) revealed that individuals with a diagnosis of any psychiatric disorder were highly likely to have recurrent ED visits (Baillargeon et al., 2008). Since the start of the 21st Century, ED visits within the United States have grown from 93.1 million visits during 1998 to 129.5 million visits in 2011 (Doran et al., 2015).

As the understanding of mental disorders and related treatments has grown, medical, scientific, and other related disciplines have focused on the characteristics of mental disorders and their implications for treatment and the generation of future research (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition [DSM-V], 2013). Mental disorders are characterized by a set of symptoms affecting emotions, thoughts, and behaviors (Mayo Clinic, 2016). Examples of signs and symptoms include (Mayo Clinic, 2016):

- Feeling sad or down

- Disoriented thinking or a diminished ability to concentrate

- Excessive fear, worry, or feelings of guilt

- Social withdrawal

- Extreme low energy or problems sleeping

- Separation from reality (delusions), paranoia or hallucinations

- Inability to cope with daily life or stress

- Problems understanding and relating to situations and people

- Alcohol and/or drug abuse

- Excessive anger, hostility, or violence

Within the United States, there is an increasing prevalence of both mental disorders and ED visits (AHRQ, 2012; Doupe et al., 2012; La Calle et al, 2013; Liu et al., 2013; Minsky et al., 2011). Researchers have suggested that mental health patients now make up the fastest group of persons seen within the ED setting (Larkin et al., 2009). This increase of ED utilization has placed an additional burden upon an already taxed subset of the healthcare system (American Association for Emergency Psychiatry, 2009). Furthermore, there are an estimated 4,000 general EDs within the United States (AHRQ 2009; Larkin et al., 2009), of which 146 are enabled to serve psychiatric patients (AHRQ, 2009; Larkin et al., 2009). Individuals with a mental disorder may present to an ED with a psychiatric issue as their main reason for a visit. However, a large portion of these individuals present with significant medical concerns, injuries and trauma, somatic complaints, psychological, and behavioral problems (Larkin et al., 2009). Research studies related to this problem revealed that nearly one-half of ED patients could possess a substance disorder and more than one-third could meet the diagnostic criteria for depression (Boudreaux, Clark, & Camargo, 2008). Some mental health issues may be more obvious and openly discussed among patients with the provider, whereas for other issues, patients others may not be forthcoming with information; this can lead to an undiagnosis or underdiagnosis (Larkin et al., 2009).

Although a number of researchers have identified common diagnoses among frequent ED users (La Calle et al., 2013; Lunsky et al., 2012; Minsky et al., 2011), the

need for research to better understand the demands and requirements of frequent users of

emergency health services has also been documented (Han et al., 2011; Knowlton et al.,

2013; Moe et al., 2015). Moreover, most studies included within this proposal had robust

sample sizes to infer comparisons of nonfrequent and frequent ED users, reported deaths,

admissions and/or outpatient outcomes. For example, a study conducted by Han et al.

(2011) examined prevalence and predictors of health service utilization among a sample

of 9,957 adults aged 65 years and older from the 2004-2007 National Survey on Drug

Use and Health (Han et al., 2011). In a logistic regression analysis, Han et al. revealed

that among older adults, women were more likely than men to possess serious

psychological distress, more precisely, major depressive disorder, and to seek mental

health treatment within a recent year (Han et al., 2011). Additionally, Moe et al. (2015)

identified 374 studies, of which 31 were cohort and cross-sectional studies. Findings by

Moe et al. revealed frequent ED users appeared to possess higher mortality, hospital

admissions, and outpatient visits when compared to their nonfrequent counterparts (Moe

et al., 2015).

<p style="text-align:center;">**Problem Statement**</p>

One in 17 Americans lives with a serious mental illness such as schizophrenia,

major depression, or bipolar disorder (National Institute of Mental Health [NIMH],

2013). Although many continue to attempt closing their budget gaps, other states have cut

close to $2.0 billion from their mental health budgets over the past three fiscal years

(NASMHPD Research Institute, 2011). During recent years, the United States

experienced its worst recession since the Great Depression. From 2009 to 2011,

substantial cuts to non-Medicaid state mental health spending totaled $1.6 billion

(National Alliance on Mental Illness [NAMI], 2011), with deeper cuts anticipated for 2011 and 2012 (NAMI, 2011). Such cuts within state budgets leaves thousands of people living with serious mental illness (SMI) without critically needed services, including community and hospital-based psychiatric care, housing, and access to medication (NAMI, 2011). Medicare remains the most important source of funding for public mental health services (Medicaid, 2016). Mental health receives a majority of its funding from two sources, Medicaid, a joint federal-state program, and state general funds overseen by state mental health authorities, which was reduced from 46% in 2007 to 40 % in 2007 (Lutterman, 2010).

During 2009 and 2011, states cumulatively cut more than $1.8 billion from their budgets for children and adults living with mental illness (NAMI, 2011). Of the 10 states that cut the most in general funds from their mental health budgets between 2009 and 2011, Arizona ranked fourth behind Illinois, a close third (NAMI, 2011). Between 2009 and 2011, Arizona cut $108.4 million from their mental health budget (NAMI, 2011). When compared to other states with substantial cuts of general funds from their mental health budgets, in terms of population, numbers of children and adults living with mental illness and the size of the overall budget, Arizona is tied with South Carolina at third with 23% (NAMI, 2011). Alaska ranks first at 35% (NAMI, 2011). The substantial reduction of critical mental health services between 2009 and 2011 left about 14,000 Arizonans with a mental illness without services such as case management, medications, access to groups, and housing and transportation subsidies (Santa Cruz & Powers, 2011). To offset the impact to the state's SMI population, then Governor Jan Brewer proposed $10.3 million to prevent gaps in psychiatric medications (Santa Cruz & Powers, 2011). An

estimated 5,200 persons with SMI, as well as thousands more who qualified for other

behavioral health services, were among 280,000 childless adults who faced losing their

coverage under the governor's plan (NAMI, 2011). Specific services that have been

eliminated or downsized, many of which are those most essential to assist persons living

with SMI in avoiding crises and embracing recovery, include (Lutterman, 2010):

- Acute (emergency) and long-term hospital treatment

- Crisis intervention teams and crisis stabilization programs

- Targeted, intensive case management services

- Assertive Community Treatment (ACT) programs

- Supported housing

- Targeted case management and clinic services for children and adolescents

- Access to psychiatric medications

Purpose of Study

The purpose of the study was to determine the factors and underlying dimensions

by which Arizonans with a mental illness present to the ED. In this research, I identified

the statistically significant factors that explain the variation and covariation among the

predictors (enabling, predisposing, and need). My results add to the current

understanding of the magnitude and severity of ED use by mentally ill persons (Green &

Salkind, 2003). Determining the magnitude and severity among identified factors and ED

use was a necessary first step for informing those in practice, administration, and

protecting the health of mentally ill persons. For this study, independent variables were

enabling, predisposing, and need factors. The dependent variable was ED visits.

Research Questions

This study was designed to address two main research questions:

Research Question 1: What factors (enabling, predisposing and need) are associated with whether Arizonan's with a mental illness will present to the ED?

$H_0$1: There is no association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

$H_1$1: There is an association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

Research Question 2: What combination of factors (enabling, predisposing and need), if any, is most predictive of frequent ED use?

$H_1$2: There is no association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

$H_1$2: There is an association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

Theoretical Model

The behavioral model (BM) has been employed frequently in the United States and applied in a number of systematic reviews on various components of health care utilization (de Boer, Wijker, & de Haes, 1997; Hulka & Wheat, 1985; Kadushin, 2004; Mc Cusker, Karp, Cardin, Durand, & Morin, 2003; Padgett & Brodsky, 1992; Phillips, Morrison, Andersen, & Aday, 1998). The theoretical model serving as the framework for this study was Andersen's (1995) revised behavioral model of health care utilization. Initially developed in 1968, the model proposed that an individual's use of health services is a consequence of their predisposition to use services, factors enabling or impeding use,

and their need for care. This model, therefore, provided much needed insight into the rate of utilization and depletion of medical resources (Andersen & Newman, 1995). Health care utilization and access remain vital components of disease management (Babitsch, Gohl, & von Lengerke, 2012). Andersen's model (1995) defines utilization as inclusive of need, predisposing, and enabling factors (Andersen & Newman, 1995). For the purpose of this study, an individual's perception of health incorporated an accurate professional evaluation of presenting mental issues to the ED such as depression and psychological distress. This theoretical framework presents service use as form of individual behavior (Andersen & Newman, 1995). A number of research study efforts within the behavioral sciences have attempted to explain individual behavior as a function of characteristics of the individual himself, environmental components, and societal interaction (Moore, 1969).

The BM integrates both individual and contextual determinants of health services use (Babitsch et al., 2012). The key elements for this study were related to the main factors of Andersen's model (1995), are enabling, predisposing, and need. Andersen's model identifies individual health service use as a function of these three characteristics (Andersen, 1995):

Need Factors

These are considered at the individual level and differentiated from perceived need (i.e., one's own viewpoint of their health status) and evaluated need (e.g., a professional assessment and objective analysis of the patient's health status and need for care). The demand for mental health programs combined with cuts has created a backlog for providers. As staffs are cut, social workers see their caseloads grow, which often

translates to patients being left on waitlists for greatly needed medication reviews and/or medication adjustments. In turn, these delays in care result in an increase of persons with mental health related issues presenting to EDs throughout Arizona.

Predisposing Factors

These consist of individual, demographic attributes of age, sex, social components including education, employment, ethnicity, and social connections (e.g., household status) and mental factors related to health beliefs (e.g., feelings, values, and literacy associated with health and health services). Due to budget cuts, many group homes and housing subsidies are not available. Crisis counseling and appropriate psychiatric care is limited. These factors compel numerous Arizonans with SMI in crisis present to the ED.

Enabling Factors

These are comprised of financial and organizational areas thought to contribute to conditions prompting health services use. Personal finances considers an individual's ability to pay for services needed, the effective cost of care decided by health insurance standing, and cost-sharing obligations. Persons with SMI face challenges being hired and maintaining steady employment. Income levels are much lower for individuals with a severe mental illness.

<center>**Nature of Study**</center>

I used secondary data attained from 2013 AZDHS- Hospital Inpatient Discharges & Emergency Room Visits for mental disorders from the Bureau of Public Health Statistics (see Appendix A) to examine the underlying dimensions and factors related to an ED visit by reviewing values from admissions data to Arizona EDs, as well as demographic and payer information to examine possible predictors. This study employed

a factor analysis technique to detect whether an inter-correlation existed among the variables. I examined the intercorrelation by creating a correlation matrix of all variables, including enabling (payer), predisposing (gender, age) and need (bipolar, schizophrenia, alcohol, panic, and major depressive disorder). The research questions examined which factors and combination (if any) best predict an ED visit. Upon review of the correlation matrix, it was then necessary to determine if extreme multicollinearity and singularity are present. Although mild multicollinearity is not problematic for factor analysis, extreme multicollinearity and singularity are. Singularity causes problems in factor analysis (Field, 2000). It becomes impossible to identify the unique contribution to a factor of the variables that are highly correlated. SPSS performed the test of multicollinearity and singularity. The determination of the R-matrix should be greater than 0.00001. Where the value is less than 0.00001, an examination of the correlation matrix was conducted to identify variables that correlated very highly ($R > 0.08$) and to consider eliminating one or more of the variables before moving forward. This analysis was conducted at an early stage and eliminated variables that did not correlate with any other variables or that correlated very highly with other variables ($R < 0.09$) (Field, 2000).

A scatterplot was implemented following the analysis of the correlation matrix. A scatterplot is used to examine the existence of any relationship. A scatterplot yields a number of results about the data, for example, identifying whether a relationship exists and if there are cases present that substantially differ from the others (Field, 2000; Green & Salkind, 2003). Additionally, the inclusion of a scatterplot reveals if any outliers are present and provides a general trend of the data.

The data used in this study were collected by the Arizona Department of Health Services-Bureau of Public Health Statistics, Emergency Room Visits Statistics for mental disorders FY 2013. I examined this data to determine an inter-relationship among enabling, predisposing, and need variables. The data used age, sex, payer, and mental disorder as the predictor variables. Healthcare utilization, more precisely ED visits, was evaluated as the outcome variable. This information was obtained from ED admission data collected from the state of Arizona. The use of an exploratory design provided information on ED use among Arizonans with a mental illness.

Definitions

The terms listed below are defined for the purpose of this study:

Frequent ED user (FEDU): More than 4 visits to the emergency room in a 12-month period (Locker, Baston, Mason, & Nicholl, 2007).

Serious mental illness (SMI): Characterized by serious functional impairment which substantially interferes with or limits one or more life activities. The following conditions are considered SMI: schizophrenia, paranoid and other psychotic disorders, bipolar disorders (hypomanic, manic, depressive and mixed), and major depressive disorder (single episode or recurrent) (DSM-V, 2013; NIMH, 2014).

Regional behavioral health authority (RBHA): An agency appointed by the state to oversee services for those who qualify for public services (Arizona Department of Health Services-Division of Behavioral Health Services [AZDHS-DBHS], 2013a; Community Partnership of Southern Arizona [CPSA], 2013).

Assumptions, Scope and Delimitations, and Limitations

Assumptions

I assumed the following about the secondary dataset I used in this study:

- The sampling procedure can yield and generalize results

- The data from the 2013 AZDHS- Hospital Inpatient Discharges & Emergency Room Visits for mental disorders from the Bureau of Public Health Statistics database has a common variance, normally distributed, and representative of the study population

- Any missing data from the 2013 AZDHS- Hospital Inpatient Discharges & Emergency Room Visits for mental disorders is completely random and does not introduce bias

I assumed the following about my use of correlations to address the stated hypotheses for this study:

- The variables may correlate too highly

- Any identified relationship does not imply cause

The following assumption was made based on my use of factor analysis:

- Factors to extract based on the magnitude of the eigenvalues are greater than 1

Scope and Delimitations

Data from the Arizona Department of Health Services: Population Health and Vital Statistics-Hospital Inpatient Discharges and Emergency Room Visits, Statistics for Mental Disorders FY2013, served as the sample for the study. ED visit data for patients with mental disorders used for the sample included ICD-9-CM codes 290-319, representing the five major characteristics of serious mental illness (SMI). County data represented within the sample consisted of patients with SMI across the four RBHAs in

the state. Additionally, the statistical instrument chosen, factor analysis, supports the

validity of this study's choice of measurements (enabling, predisposing, and need). The

extraction of factors from the correlation matrix is necessary to make initial decisions

regarding the number of factors underlying the set of chosen measures (Field, 2000;

Green & Salkind, 2003).

The study population was mentally ill adults aged 20 years and older living in

Arizona. Although the 2013 AZDHS- Bureau of Public Health Statistics for Arizona

hospitals was collected to include a number of factors, the data will be delimited for the

purpose of this study to focus on emergency room visits for persons with mental

disorders (ICD-9-CM codes, 290-319).

Limitations

I anticipated the following limitations for this research based on my use of secondary

data:

- I will not be able to control or change the assignation or categorization of

  variables present in the dataset

- I cannot use variables not collected as potential confounders

- I am unable to judge the quality or completeness of data from the 2013 AZDHS-

  Bureau of Public Health Statistics for Arizona

Significance

Previous researchers have highlighted the need for deeper exploration into

frequent ED use and mental illness (Chang et al., 2012; Chen et al., 2015; Chukmaitov et

al., 2012; Crane et al., 2012; Fertel et al., 2015; Han et al., 2011; Knowlton et al., 2013;

La Calle & Rabin, 2010; Liu et al., 2013; Moe et al., 2015; Nossel et al., 2010; Salazar et

al., 2005; Vandyk et al., 2013). My study provided much needed insight into healthcare utilization among Arizonans with a mental illness and the combination of factors that influences an ED visit. The study rests upon a foundation, which includes public health research efforts aimed at protecting the health of Arizonans living with SMI. Public health is multi-faceted and I have attempted to provide clarity as to why some are more likely than others to suffer from poor health outcomes (American Public Health Association [APHA], 2016). Ensuring mentally ill Arizonans receive appropriate care upon presenting to the ED and promoting conditions in which they can be healthy were essential motivations for this research and my results will contribute to improvements in to public health and social justice (APHA, 2016). Social justice is concerned with the well-being of all persons. The burden of mental health is faced by many including Arizonans. Study efforts aim to display a course of actions consistent with upholding the dignity and mutual respect for all members of the mental health population. My research demonstrated the significance of ED patient data in identifying vulnerable populations and will serve as a support for targeted approaches to public health intervention. Furthermore, the information discovered in this study will assist future scholars to more concisely understand healthcare utilization, especially as it pertains to ED use in Arizona.

Research studies are necessary for the assessment of trends in health service use and for the enhanced training of providers, so they can be better equipped to more accurately identify a patient presenting to the ED with a health problem related to a psychiatric disorder. Results of my study could be applied to advance emergency medicine (EM) curricula by introducing formalized training in mood disorders and substance abuse. Moreover, the application of the Accreditation Council for Graduate

Medical Education (ACGME) focus areas including psychiatric patients presenting to the ED would encompass patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-centered practice (Larkin et al., 2009).

An examination of Arizona's SMI population demographics can further inform providers and administrators about the population that is presenting to the ED. It is essential that providers and administrators understand patient demographics and related data, as they provide answers to questions such as who these people are and where they live. Answers to these questions are important for the development of effective interactions, the allocation of available resources, and the improved lives of individuals with SMI.

Summary

In this chapter, I have presented the urgency for continued research related to ED use and mental illness within the Arizona SMI population, significant background information on mental disorders, and the burden of illness, particularly concentrated among those with SMI I presented the research problem, purpose, and questions, and the methodology I used to address the research questions. The theoretical model, BM, was presented as an appropriate framework for this study. Finally, I discussed the scope, assumptions, and limitations associated with this research.

In Chapter 2, I provide an exhaustive literature review of the variables of interest, including ED use and frequent users, ED use and mental illness, ED use and Arizona, SMI and frequent ED use prevalence in Arizona, to provide an understanding of the prior research, which supports my proposed study.

In Chapter 3, I provide an overview on the chosen methodology and research questions, research design, sampling procedure, inclusion and exclusion criteria, and ethical considerations.

In Chapter 4, I present the results acquired based on the research design, sampling strategy, research questions, and relevant issues associated with ED use. Lastly, in Chapter 5, I discuss my major findings, evaluate my results within the context of the Andersen's Behavioral Model (1995), and reveal similarities identified from previous literature examined in Chapter 2. I suggest limitations related to the study and include recommendations for future research. I conclude with a discussion of the potential impact of this research on positive social change.

Chapter 2: Literature Review

Introduction

This study was conducted to examine ED use among Arizonans with a mental illness. Prior research findings have identified a profound and growing mental health burden and its negative impact upon ED use. It is essential to understand the magnitude and severity of ED use within this vulnerable group. By pioneering research to determine the impact of the variables under investigation, this study will be a catalyst for the formulation of new research questions. Additionally, results from this study could assist in setting future research priorities and rerouting the direction of valuable resources.

In this chapter, I provide an overview of the extant literature related to this study. I discuss the literature related to the BM, its use in other studies, and the three determinants of health care use I used as my independent variables. I present findings related to mental health, the gaps in coverage for mental health issues, and the resulting overuse of the ED to address those issues.

Literature Search Strategy

This analysis sought to synthesize and critique the literature reviewed and justify further investigation into ED use among mentally ill Arizonans. The literature review search strategy employed for this study consisted of electronic databases, journal websites, and a record of peer-supported articles and research studies. The electronic databases used were CINAHL, MEDLINE, Proquest, PsychARTICLES, PsychINFO, Bio Med Central, PubMed-PMC, AHRQ-HCUP, and the publisher's databases, Springer, Jones, and Bartlett and Elsevier. EBSCO, Google Scholar, and ERIC were added to amplify the research databases. The databases were examined from January 2005 to June

2015 to distinguish pertinent citations. The following key terms were included during the database search: *prevalent ED visits, prevalent ED, ED frequency, ED visit prevalence, frequent ED utilization, prevalent use and emergency room, frequent use and ED, frequent visitors and ED, heavy emergency room use, heavy use and ED, chronic ED, repeated utilization and the ED, repeat utilization and ED, repeat use and emergency care, recidivism and emergency care, recidivists, and ED.*

I limited my database search to studies conducted exclusively within the United States. The search format selected English-language prospective and retrospective studies published in peer-supported articles from 2005-2015. For example, MEDLINE and AHRQ contained articles produced from 2005, whereas research databases such as CINAHL Plus with Full Text, Proquest , PsychINFO, Bio Med Central, and PubMed-PMC included articles produced since 2010. This examination provided entry to multiple publications on the subject matter, which were studied and included within this chapter. In addition to the examination of electronic databases, literature cited in methodical reviews on psychiatric morbidity and mortality and characteristics of psychiatric illness were analyzed.

I searched and examined diverse sources of literature specific to mental illness. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) by the American Psychiatric Association, American Psychological Association, and the Annals of Emergency Medicine, were obtained by conducting searches in local public and medical libraries. I conducted internet searches to locate applicable literature using the aforementioned key terms, and search features such as EBSCO. Websites, such as the

American Hospital Association and American Academy of Emergency Medicine, were

also examined.

Theoretical Model

Sociologist and health services scholar Ronald M. Andersen developed the

original version of his model during the late 1960s titled, *Families' use of health

services: a behavioral model of predisposing, enabling and need components* (Andersen,

1968). Dr. Andersen, aimed to assist fellow scholars' understanding of why families used

health services, measure equal access to health care services, and contribute to policy

development and the promotion of equal care access (Andersen, 1968). During this time,

Dr. Andersen was pursuing acceptance from his dissertation committee at Purdue

University (Andersen, 1968). During the late 1960s, Andersen had identified gaps within

the current literature as it relates to health services utilization (Andersen, 1968). By the

early 1970s, Dr. Andersen and fellow colleague Dr. John F. Newman identified studies

that had only addressed individual components related to health services use, and found

that very few had addressed the societal impacts (Andersen & Newman, 1973). Although

other models existed, Andersen's version sought to integrate multiple ideas into why and

how health services were used (Andersen, 1995). This model was designed to explain the

utilization of health services but did not emphasize the importance of the interactions,

which take place when an individual receives care and the health outcomes that follow

(Andersen, 1995).

It is important to note that more than one version of Andersen's model exists. In

addition to the original version of the model (1968), four others have been developed and

utilized as a framework for research studies. Presently, the 1995 version of the model is

the most widely referenced and I chose that version as the basis for this study (Babitsch,

Gohl, & von Lengkerke, 2011). Versions of the model developed since Andersen's 1968

original contribution are as follows: The Andersen-Newman Service Utilization Model

(1973), Andersen's Behavioral Model (1995), Andersen and colleagues Behavioral

Model for Vulnerable Populations (Gelberg, Andersen , & Leake, 2000), and the

Andersen-Davidson's Behavioral Model of Health Services Use (2001).

Andersen's original model (1968) examined three classifications of determinants,

predisposing, enabling, and need factors (Andersen, 1968). Predisposing factors represent

the tendency to utilize health care services (Andersen, 1968). As stated by Andersen

(1968), the individual is either more or less likely to utilize health care services due to

demographics, socioeconomics, and beliefs of health services benefits; thus, those who

believe the services are useful are more likely to utilize the service for treatment

(Andersen, 1968). Enabling factors consist of available resources both in the community

and at the individual level (Andersen, 1968). Private resources include economic

condition and residency (Andersen, 1968). Community resources integrate access to care

and the availability of services (Andersen, 1968). Finally, need factors include the

perception of need for health services, whether the need was socially, individually, or

clinically supported (Andersen, 1968).

During the 1970's, the model was amplified to include the health care system

(Andersen & Newman, 1973). This inclusion of policy, resources, organization, and the

changes within each over time enriched the updated model (Andersen & Newman, 1973).

Additionally, organization applies to how the health care system oversees its resources,

which eventually affects structure and access to care (Andersen & Newman, 1973). As

reported by this expanded version of Andersen's original model (1968), how the

organization dispenses its resources and whether or not a sound workforce exists

determines if an individual uses health services (Andersen & Newman, 1973).

Additionally, this version of the model recognizes consumer satisfaction as it reflects

upon health care use (Andersen & Newman, 1973). Finally, this expanded model

identifies a number of health services and types available (e.g., hospital, dentist or

pharmacy) and the purpose of health care services (e.g., primary or secondary care)

determines the type of service utilized (Andersen & Newman, 1973). Andersen and

Newman (1973) concluded that when combined, a specific health care service and

frequency would bear opposing influences due to population attributes and health

services (Andersen & Newman, 1973).

Andersen's model was further expanded during the 1980s-1990s to include

primary determinants, health behaviors and health outcomes (Andersen, 1995).

According to this version of the model, primary determinants are a direct consequence of

health behaviors (Andersen, 1995). This includes demographics, resources and

organization, political, physical, and economic influences of use (Andersen, 1995). A

now widely used version of Andersen's original model states health behaviors guide

health outcomes (Andersen, 1995). Health outcomes consist of perceived and elevated

health status, patient satisfaction, individual health practices (e.g., nutrition and physical

activity) and health utilization (Andersen, 1995).

During the early 2000s, two more expanded versions of the original BM were

developed and include Andersen and colleagues' Behavioral Model for Vulnerable

Populations (Gelberg et al., 2000) and the Behavioral Model of Health Services Use

(Andersen & Davidson, 2001). The aforementioned areas, health utilization and individual health practices, were integrated into this version of the model (Gelberg et al., 2000). This inclusion supported their applicability in studying homeless and other at-risk groups, social framework and enabling resources (Gelberg et al., 2000).

Further, the three domains that support the structure of this model include predisposing, enabling, need, and personal health practices traditional domains (Gelberg et al., 2000). The predisposing traditional domain incorporates demographics, health beliefs and social framework (Gelberg et al., 2000). Demographic attributes include age, gender and marital status (Gelberg et al., 2000). The predisposing vulnerable domain attributes consist of ethnicity, education, occupation and family type (Gelberg et al., 2000). Also included within this domain are childhood attributes (e.g., foster care group home assignment, abuse and mistreatment history and parental illness), residential history (e.g., housing or lack thereof), living conditions (e.g., sanitation, heating and cooling lead paint and unsafe structures), mobility (e.g., moving to and from communities), criminal history, victimization, mental illness, psychological tools (e.g., mastery, coping, self-esteem, cognitive ability and developmental delay), and substance abuse (Gelberg et al., 2000).

The enabling traditional domain incorporates individual resources to include an ongoing source of care, insurance status and income (Gelberg et al., 2000). Community resources consist of residence, designation and health services resources incorporating volume (e.g., provider-population rate and hospital-bed-population rate), distribution, financing, price, entry, structure and process of care (Gelberg et al., 2000). Its vulnerable

domain consists of individual resources, including receipt of public assistance, competing

needs, availability, and use of information resources (Gelberg et al., 2000).

The model's need traditional domain consists of an individual's perceived need

and evaluated need of general population health status (Gelberg et al., 2000). Its

vulnerable component incorporates perceptions and evaluated need relevant to at-risk

groups such as, tuberculosis, sexually transmitted diseases, premature and low-birth

weight babies and acquired immunodeficiency syndrome (AIDS) (Gelberg et al., 2000).

Also included within this domain are mental health and substance abuse, instead of its

predisposing counterpart (Gelberg et al., 2000). Of note, a practitioner's evaluation of

patients could be affected by the individual's vulnerable status (Gelberg et al., 2000).

According to the model, patients' perceptions of their health could be correlated to their

vulnerable state (Gelberg et al., 2000).

Andersen et al. (2000) final domain areas are the personal health practices

traditional and outcomes (Gelberg et al., 2000). Its personal health practices traditional

area includes nutrition, physical activity, self-care, tobacco use, adhering to care and use

of health services (Gelberg et al., 2000). Its vulnerable domain consists of food source,

hygiene and risky sexual behavior (Gelberg et al., 2000). Exceeding both traditional and

vulnerable areas, the outcomes domain incorporates perceived and evaluated health status

and satisfaction with care (Gelberg et al., 2000).

This study employed Andersen's 1995 version BM. This framework allowed for

further examination of health services use and considered both individual and societal

components (Andersen, 1995). This study recognized the need to identify accurately the

most significant predictors of ED use by those with a mental illness (Acosta & Lima,

2015; Crane et al., 2012; Knowlton et al., 2013; Lunsky et al., 2012). The key components of Andersen's BM include its predictor factors, need, predisposing and enabling (Acosta & Lima, 2015; Andersen, 1995; Lunsky et al., 2012). In the next sections, I discuss the key components of the BM in more detail.

Need Factors

Need factors are considered at the individual level and differentiated from perceived need (i.e., one's own viewpoint of their health status) and evaluated need (e.g., a professional assessment and objective analysis of the patient's health status and need for care). Distinctions are made among environmental need attributes and population health indicators. Environmental need considers health-related circumstances of the environment (e.g., employment, traffic and crime-associated injury and mortality rates). Population health indicators are general measurements of community health and epidemiological components which include mortality, morbidity and disability.

Predisposing Factors

Predisposing factors are the individual, demographic attributes of age, sex, and social components to include education, employment, ethnicity and social connections (e.g., household status) and mental factors related to health beliefs (e.g., feelings, values and literacy associated with health and health services). Contextual characteristics predisposing individuals to utilize health services incorporate demographic and social makeup of communities, collective and organizational values, cultural standards, and political viewpoint.

Enabling Factors

Enabling factors include finances and organizational areas thought to contribute to conditions prompting health services use. Personal finances considers an individual's ability to pay for services needed, the effective cost of care decided by health insurance standing and cost-sharing obligations. Organizational factors consider whether an individual has a steady source of care and its type. Also included are forms of transportation, commute time, and time spent awaiting care. At the contextual level, wealth addresses resources accessible within the community for health services and includes per capita community income, affluence, cost of health care insurance, the proportionate price of goods and services, methods of reimbursing providers and health care expenses. At this level, organization pertains to health policies, cost, selections, placement, structures, and the division of health services, facilities, and staff. This also encompasses physician and hospital density, office hours, provider variety, quality management involvement, outreach and educational programs.

Diagnosis of Mental Disorders

An increased level of psychiatric problems and higher than expected rates of mortality due to medical illnesses are present among frequent ED users (Nossel et al., 2010; Baillargeon et al., 2008; Richard-Leopouriel et al., 2015; Buccelletti et al., 2013; Merrick et al., 2010; Pillow et al., 2013). Findings have revealed that individuals with mood, substance use, anxiety, or psychotic disorders and past repeated ED use appear to depend on this service for continuous psychiatric care more than those without repeated use of the ED (Han et al., 2011; Nossel et al, 2010; Pillow et al., 2013; Sandoval et al., 2010). The inclusion of DSM-5 provides an objective and evidence-based analysis of

psychiatric disorders associated with health care services use among frequent ED users and is discussed in this review.

Validity as it relates to diagnosis is essential to the development of effective treatment plans, the identification of population groups for research purposes, recording pertinent health data to include morbidity and mortality rates (DSM-5, 2013). The Diagnostic and Statistical Manual of Mental Health Disorders, Fifth Edition (DSM-5) has become a widely used resource and standard reference throughout the scientific community (DSM-5, 2013). Scholars working with the numerous facets of mental health practice rely on this tool due to its consistency and objectivity of individual DSM disorders (DSM-5, 2013). The inclusion of reliability allows for an accurate overview of patient presentations and serves as a found of validity supporting the diagnosis (DSM-5, 2013). The Manual's development aimed to fulfill the needs of clinicians and researchers by providing precise descriptions of each mental health disorder categorized by precise diagnostic criteria, an extensive discussion of the diagnosis, risk factors, associated features, research advancements, and multiple expressions of the disorder (DSM-5, 2013). Further, DSM-5 identifies symptoms, behaviors cognitive factors, personality traits, physical signs, syndrome combinations and time (DSM-5, 2013).

Accurate identification requires in-depth clinical knowledge to differ normal life processes from responses caused by stress (DSM-5, 2013). Despite numbers of mental disorders now possessing well-established boundaries around symptom clusters, due to evidence-based research, many disorders are now placed within a spectrum alongside fellow disorders, which are closely related, shares symptoms, genetic and environmental risk factors and potentially mutual substrates (DSM-5, 2013). A number of studies

identified the following disorders as presenting characteristics found substantially among repeat ED users: Bipolar II Disorder, Panic Disorder, Schizophrenia, Major Depressive Disorder without Bipolar II Disorder and Substance/medication-induced disorder (Lunsky et al., 2012; Merrick et al., 2010; Minassian et al., 2013; Minsky et al., 2011; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015; Nossel et al., 2010; Ondler et al., 2014; Sandoval et al., 2010; Todman, 2011) . The advancements of DSM are necessary to refine understanding, decrease stigma and promote the progression of treatment and ultimately, cures for these disorders (DSM-5, 2013).

Burden of Mental Illness

The number of Americans diagnosed with mental health illnesses increased from 19.3 million to 36 million between 1996 and 2006 (AHRQ, 2009). In terms of expenditure, mental health disorders surpassed the four most expensive chronic and acute health conditions, which include: cardiovascular illness, cancer, trauma-associated disorders, and respiratory illness (AHRQ, 2009). As stated by the Diagnostic and Statistical Manual, 5th Edition (2013), mental illnesses are related to disorders commonly characterized by deregulation of mood, thought, and/or behavior (DSM-5, 2013; Centers for Disease Control [CDC], 2013).

According to a report released by the Substance Abuse and Mental Health Services Administration (SAMHSA), National Survey on Drug Use and Health (NSDUH) estimates stratified by state of adult mental illness from 2011 and 2012, and SMI prevalence among adults aged 18 and older, reflected a national rate of 4% (9.3 million) of Americans (SAMHSA, 2014). Among individual states, the percentage of adults 18 and older with SMI ranged from 3.1% in New Jersey to 5.5% in West Virginia

(SAMHSA, 2014). Additional states with high rates of SMI include Oklahoma (5.2 %), Utah, Washington and Arkansas (5.1 %), Kentucky and Vermont (4.74 %), New Mexico (4.72 %), Mississippi (4.69 %), Idaho (4.67 %), and Arizona and Oregon (4.6 %) (SAMHSA, 2014). Arizona ranks 50th in the nation for access to mental healthcare (Mental Health America [MHA], 2015). Furthermore, there are in excess of 100 mental health professional shortage areas within the state (MHA, 2015). These shortage areas reflect a declaration from the federal government that there are not sufficient numbers of providers to treat this population group (MHA, 2015). Within these areas, there is one psychiatrist for every 30,000 people (MHA, 2015).

Mood disorders are the most distributive of all mental disorders (CDC, 2013; DSM-5, 2013; Richard-Lepouriel et al., 2015; Buccelletti et al., 2013; Nossel et al., 2010; Baillargeon et al., 2008; Minassian et al., 2013). Pervasive disorders with higher disability and mortality rates are identified within this population and include: bipolar disorder II, substance/medication-induced anxiety disorder-alcohol use disorder (mild, moderate, and severe), panic disorder, schizophrenia, and major depressive disorder (MDD). Patients presenting to EDs with a mood disorder appeared to use this health service for continuous psychiatric care more than patients without the diagnosis (Merrick et al., 2010; Pillow et al., 2013; Ondler et al., 2014; Sandoval et al., 2010; Fleury et al., 2013; Cuddeback et al., 2010; Han et al., 2011). Mental disorders vary and present differently (World Health Organization [WHO], 2015; DSM-5, 2013; CDC, 2013). Generally, an assembly of abnormal thoughts, perceptions, emotions, behaviors, and social interactions (WHO, 2015; DSM-5, 2013; CDC, 2013) characterize mental disorders. The World Health Organization (2015) estimates the burden associated with

mental disorders will continue to flourish, greatly affecting health care systems and yielding significant economic outcomes (WHO, 2015). The inclusion of DSM-5 (2013) within my study also incorporated the official coding system within the United States, the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM). Due to the timing of DSM-5 (2013), ICD-9-CM was represented throughout my work. Mental disorders discussed within the proposed study include estimates of prevalence, mortality, disability, and impairment associated with included mental disorders.

Bipolar II Disorder

Bipolar II disorder is indicated by a distinctive series of events, a recurring mood episode comprised of a single or multiple major depressive (MDD) episode and, at minimum, one hypomanic episode (DSM-5, 2013). The MDD episode must persist for at least two weeks, and its co-illness, hypomanic episode, for at least four days, to meet diagnostic criteria (DSM-5, 2013).

Prevalence. Internationally, 12-month prevalence of bipolar II disorder is 0.3%, with a 0.8% presence within the United States (DSM-5, 2013). DSM-IV yielded a combined prevalence rate of 1.8% for US and non-U.S. community samples for bipolar I & II and bipolar disorder not specified (DSM-5, 2013).

Functional consequences of Bipolar II Disorder. DSM-5 (2013) states that persons with bipolar II disorder exhibit multiple mood episodes, with many returning to full functioning status in between episodes (DSM-5, 2013). The diagnostic tool has determined that at least 15% experience some level of inter-episode disturbance, with 20% moving directly into another mood episode without inter-episode recovery (DSM-5,

2013). Individuals meeting the criteria for this illness would perform inadequately on cognitive tests when compared to healthy persons (DSM-5, 2013). Bearing such a disability leaves these individuals to face extended unemployment, often exacerbated by multiple episodes of depression, aging, elevated rates of current panic disorder, and a history of alcohol use (DSM-5, 2013).

Comorbidity. Bipolar II disorder is commonly correlated with single or predominately co-occurring mental disorders, anxiety disorders being most frequent (DSM-5, 2013). Roughly 60% of persons with the disorder also experience three or more co-occurring mental disorders; 75% have an anxiety disorder; and 30% have a substance use disorder (DSM-5, 2013). Persons having both anxiety and substance use disorders experience this co-occurrence at much higher rates than the general population and have an increased likelihood of being hospitalized (DSM-5, 2013; Baillargeon et al., 2008). About 14% of persons with bipolar II disorder have at least one life-time eating disorder (DSM-5, 2013). The most common of these disorders is binge-eating disorder, followed by bulimia and anorexia nervosa (DSM-5, 2013).

Substance/Medication-Induced Mental Disorder-Alcohol Use Disorder

DSM-5 (2013) recognizes substance/medication-induced mental disorders are often temporary and potentially severe (DSM-5, 2013; Minassian et al, 2013; Richard-Lepouriel et al., 2015). This complex disorder family is distinguished from substance use disorders consisting of cognitive, behavioral and psychological symptoms contributing to the continuation of use of a substance despite its detrimental consequences (DSM-5, 2013; Sandoval et al., 2010). All substance/medication-induced disorders bear commonalities (DSM-5, 2013). Due to its dual diagnosis among mentally ill patients

presenting to the ED (Knowlton et al., 2013; Minassian et al., 2013; Sandoval et al., 2010).

Alcohol disorder consists of behavioral and physical symptoms to include withdrawal, tolerance and craving (DSM-5, 2013). Characteristics of alcohol withdrawal include symptoms manifesting approximately 4-12 hours succeeding a reduced consumption, followed by prolonged, heavy alcohol intake (DSM-5, 2013). Withdrawal from alcohol can be intense and unpleasant (DSM-5, 2013; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015). Due to this adverse event, individuals may choose to continue alcohol consumption despite its detrimental consequences (DSM-5, 2013; NIAAA, 2015). Withdrawal symptoms can include an interrupted sleep cycle persisting in low intensity for months and can signal a relapse (DSM-5, 2013; NIAAA, 2015). Upon establishing a pattern of recurring and intense use, the individual will commit great periods of time to the acquisition and consumption of alcohol (DSM-5, 2013; NIAAA, 2015).

Prevalence. Alcohol use disorder is common (DSM-5, 2013; NIAAA, 2015). According to DSM-5 (2013), the 12-month prevalence of alcohol use disorder within the United States is about 4.6% among those aged 12 to 17 and 8.5% for adults 18 years and older (DSM-5, 2013). Rates of the disorder are greater among adult males (12.4%) than adult females (4.9%) (DSM-5, 2013). Further, twelve-month prevalence of the disorder declines among middle-aged adults, being most substantial among those 18 to 29 (16.2%) and lowest in those aged 65 years and older (1.5%) (DSM-5, 2013). Prevalence of alcohol use disorder differs among U.S. ethnic groups (DSM-5, 2013; NIAAA, 2015; Knowlton et al., 2013). Twelve-month prevalence is greatest among 12- to 17-year olds

of Hispanic (6.0%), Native Americans and Alaska Natives (5.7%) comparative to whites (5.0%), African Americans (1.8%), Asian Americans and Pacific Islanders (1.6%) (DSM-5, 2013).

Functional consequences of Alcohol Use Disorder. The diagnostic characteristics of alcohol use disorder encompass leading components of life-functions likely to be diminished (DSM-5, 2013; NIAAA, 2015). Characteristics include driving and operating equipment, school and employment, interpersonal relationships, communication and health (DSM-5, 2013; NIAAA, 2015). Consequences of the disorder are conducive to absenteeism from work, job-related accidents and low productivity (DSM-5, 2013; NIAAA, 2015). Alcohol use disorder is also associated with a significant increase in the likelihood of accidents, violence and suicide (DSM-5, 2013; NIAAA, 2015). DSM-5 (2013) estimates about one out of five intensive care unit (ICU) admissions among some urban hospitals is associated with alcohol (DSM-5, 2013). Forty percent of persons within the United States encounter an alcohol-related adverse event during some point of their lives with alcohol contributing up to 55% of automobile fatalities (DSM-5, 2013). The disorder in its most severe form and in conjunction with antisocial personality disorder are related to criminal offenses to include homicide (DSM-5, 2013). Intensely problematic alcohol use contributes to a diminished emotional state and includes feelings of sadness, irritability which may advance suicidal ideation and successful suicide attempt (DSM-5, 2013).

Comorbidity. Factors existing simultaneously with alcohol use disorder include bipolar disorders, schizophrenia and antisocial personality disorder, several anxiety and depressive disorders (DSM-5, 2013). DSM-5 (2013) further states that in some degree an

association among depression and moderate to severe alcohol use disorder may attribute

to temporary, alcohol-induced comorbid depressive symptoms as a result from the acute

effects of intoxication or withdrawal (DSM-5, 2013). Severity due to repeated

intoxication contributes to the suppression of immune processes and increased

susceptibility to infections and likelihood for cancer (DSM-5, 2013; NIAAA, 2015).

Panic Disorder

Repeated unexpected panic attacks are central to panic disorder (DSM-5, 2013).

The attack consists of a sudden, rush of intense fear or discomfort which climaxes within

minutes (DSM-5, 2013). During this time four or more of a least 13 physical and

cognitive symptoms occur (DSM-5, 2013). Occurrences and severity of panic attacks

differ extensively. In terms of occurrence, an attack may be moderate (e.g., once per

week) for months at a time, or shortened eruptions of more frequent episodes (e.g., daily)

separated by weeks or months with no attacks or a reduction in attacks (e.g., two

occurrences per month) over a duration of years (DSM-5, 2013). Individuals who

experience panic attacks infrequently share commonalities with those experiencing

frequent attacks to include symptoms, demographics, comorbidity with other disorders

and genetic predisposition (DSM-5, 2013).

Prevalence. According to DSM-5 (2013), within the United States and Europe,

half of persons with panic disorder experience both expected and unexpected panic

attacks (DSM-5, 2013). However, within the general populace, twelve-month prevalence

is estimated as 2%-3% of adults and adolescents across the United States and Europe

(DSM-5, 2013). Significantly decreased rates of panic disorder are present among U.S.

Latinos, African Americans, and Caribbean blacks and Asian Americans, in contrast to

higher rates present within non-Latino whites and Native Americans (DSM-5, 2013). Women are also greatly affected and experience a panic attack at a rate approximately 2:1 when compared to men affected (DSM-5, 2013). Once individuals enter into their elderly years (i.e., 0.7% in adults aged 64 years and over) (DSM-5, 2013).

       Functional consequences of panic disorder. Components of panic disorder includes high levels of social, occupational and physical disability, great economic costs and the highest number of medical visits among the anxiety disorders (DSM-5, 2013; Buccelletti et al., 2013). Full-symptom attacks are typically related to greater morbidity (e.g., greater health services use, increased disability and decreased life quality) (DSM-5, 2013; Buccelletti et al., 2013).

       Comorbidity. The presence of panic disorder is increased among persons with disorders not mentioned here and those related to anxiety such as agoraphobia, major depression, bipolar disorder and possibly mild alcohol use disorder (DSM-5, 2013). Lifetime rates of panic disorder and major depressive disorder (MDD) differ extensively, ranging from 10% to 65% in persons with panic disorder (DSM-5, 2013). In approximately one-third of persons diagnosed with both disorders, the depression precedes the onset of panic disorder (DSM-5, 2013). A subgroup of persons with panic disorder develop a substance-related disorder as an attempt to treat the anxiety with alcohol or medications (DSM-5, 2013). Comorbidity of panic disorder is significantly related to a number of general medical symptoms and conditions to include dizziness, cardiac arrhythmias, hyperthyroidism, asthma, COPD and irritable bowel syndrome (IBS) (DSM-5, 2013).

Schizophrenia

Schizophrenia is a heterogeneous clinical illness involving a range of cognitive, behavioral, and emotional dysfunctions (DSM-5, 2013). Persons with schizophrenia will differ considerably on most features therefore an accurate diagnosis greatly rests upon recognizing a configuration of signs and symptoms related to impaired occupational and social functioning (DSM-5, 2013; Lunksy et al., 2012; Merrick et al., 2010; Nossel et al., 2010). As stated in DSM-5 (2013) at least two Criterion A symptoms must be present for a substantial period of time spanning a one-month duration or longer (DSM-5, 2013). One of these symptoms includes the presence of delusions (Criterion A1), hallucinations (Criterion A2) or disorganized speech (Criterion A3) (DSM-5, 2013). Grossly disorganized or catatonic behavior (Criterion A4) and negative symptoms (Criterion A5) may also present (DSM-5, 2013). Impairment within one or more major areas of functioning (Criterion B) and some signs of disturbance persisting continuously for at least six months (Criterion C) are also characteristic of schizophrenia (DSM-5, 2013). Mood symptoms and full mood episodes are common in schizophrenia; however, a diagnosis requires the presence of delusions or hallucinations in the absence of mood episode (DSM-5, 2013).

Prevalence. Lifetime prevalence of schizophrenia is approximately 0.3% to 0.7% (DSM-5, 2013). Variations exist among ethnic groups, countries and geographic origin of immigrants and their offspring (DSM-5, 2013). This variation continues across the sexes, for example, negative symptoms and longer duration of illness (associated with poorer outcomes) reveals a higher incident rate for males (DSM-5, 2013). However, the

inclusion of additional mood symptoms and brief presentations (associated with better outcomes) yielded equal risks for males and females (DSM-5, 2013).

Functional consequences of Schizophrenia. Substantial social and occupational dysfunction are related to schizophrenia (DSM-5, 2013; Nossel et al., 2010). Consequences of the illness negatively affect educational progression, maintaining an occupation even if cognition sufficient to perform the tasks is present (DSM-5, 2013). Very limited social interaction, retaining lower-level employment and not marrying, particularly for males are commonly placed among individuals with schizophrenia (DSM-5, 2013; Ondler et al., 2014).

Comorbidity. Substance-related disorders are substantial among individuals with schizophrenia (DSM-5, 2013). Tobacco use disorder and anxiety disorders are both prevalent among individuals with schizophrenia (DSM-5, 2013). Rates of obsessive-compulsive and panic disorder are high when compared to the general populace (DSM-5, 2013). A reduction in life expectancy due to medical conditions to include weight gain, diabetes, metabolic syndrome and cardiovascular and pulmonary disease are also more commonly found in contrast to the general population (DSM-5, 2013). Maintaining good health behaviors (e.g., cancer screening and exercise) are lacking among individuals with schizophrenia (DSM-5, 2013). Such behaviors lead to an elevated risk of chronic illness, however, the inclusion of other disorders (i.e., medication), lifestyle, cigarette smoking and nutrition also contribute to comorbidity (DSM-5, 2013; Nossel et al., 2010; Richard-Lepouriel et al., 2015).

MDD

With the exception of weight change and suicidal ideation, symptoms for MDD must be present almost daily in addition to a depressed mood (DSM-5, 2013). When presenting, individuals may complain of fatigue or insomnia; failure to further examine concomitant symptoms results in an under-diagnosis (DSM-5, 2013; Minassian et al., 2013; Merrick et al., 2010; Han et al., 2011). Fatigue and interrupted sleep are substantially higher among individuals with MDD; however, psychomotor disturbances are less frequent but are suggestive of great overall severity and presence of delusional or near-delusional guilt (DSM-5, 2013).

Prevalence. Within the United States, twelve-month prevalence of MDD is approximately 7% (DSM-5, 2013). Variations exist among age groups with 18-29 year olds yielding a threefold higher prevalence than those aged 60 years and older (DSM-5, 2013). Research performed by Han and colleagues (2011) revealed that among health service use, women with MDD was more likely among adult women (Han et al., 2011).

Functional consequences of MDD. Functional consequences of MDD resonate from individual symptoms (DSM-5, 2013). Many individuals who socially engage with those affected may be unaware of depressive symptoms as impairment can be very mild (DSM-5, 2013). Differentiation in impairment exists and range from complete incapacity, restricting the affected individual to complete tasks such as basic personal care, is mute or catatonic (DSM-5, 2013). Minsky and colleagues (2011) concluded that patients with an MDD diagnosis were just as likely as patients with schizophrenia or bipolar disorder to utilize health services (Minsky et al., 2011). For those presenting in general medical

settings, individuals with MDD experience more pain, physical illness and greater decreases in physical, social and role functioning (DSM-5, 2013).

Comorbidity. Disorders serving co-currently with MDD are substance-related disorders, pain disorder, obsessive-compulsive disorder, anorexia nervosa, bulimia nervosa, and borderline personality disorder (DSM-5, 2013).

Social Determinants of Health

Social determinants of health are the environmental circumstances in which individuals are born, live, learn, work, worship, and age that impact their life quality (Healthy People 2020, 2015; Todman, 2011; World Health Organization [WHO], 2013; Allen et al., 2014). Resources that positively contribute to improved life quality can substantially affect overall population health outcomes (Healthy People 2020, 2015; WHO, 2013; Allen et al., 2014). Examples of such resources are principles of public health and includes safe and cost-efficient housing, access to education, public safety, access to healthy foods, local/emergency health services and an environment free of life-threatening substances (Healthy People 2020, 2015; WHO, 2013; Allen et al., 2014). A more concise understanding of 'place' was also fundamental to the accurate identification of predictors of ED visits among mentally ill Arizonans (Healthy People 2020, 2015; WHO, 2013: Allen et al., 2014; Pillow et al., 2013; Ondler et al., 2013). Healthy People 2020 (2015) have identified a 'placed-based' structure reflecting five key components of social determinants of health and includes economic stability, education, social and community context, health and health care and neighborhood and built environment (Healthy People 2020, 2015). According to Pillow and colleagues (2013), social

determinants to include psychosocial issues contribute to an increase of ED visits and are discussed further in the next section (Pillow et al., 2013).

The Global Burden of Disease (GBD) Study (2013) estimated globally, 400 million people suffer from depression, 272 million from anxiety disorders, 59 million suffer from bipolar disorder, 24 million from schizophrenia and 140 million are affected from alcohol and drug use disorders (Theo et al., 2015). The literature makes a strong case that mental health and many common psychosocial disorders are greatly impacted by social determinants (Crane et al., 2010; Minsky et al., 2011; Ondler et al., 2014; Pillow et al., 2013; Richard-Lepouriel et al., 2015; Sandoval et al., 2010; Slade et al., 2010). Research study findings from Pillow and colleagues (2013) found that social determinants to include psychiatric illness (36%), substance abuse (22%), medication misuse (16%), and unstable housing (10%) were all contributors to multiple ED visits (Pillow et al., 2013). Complex psychological findings were further echoed in research performed by Nossel and colleagues (2010) revealing approximately one-third ($N = 42$, 36%) of study participants had schizophrenia and the remaining ($N = 76$, 64%) had a psychotic mood disorder (Nossel et al., 2010). The likelihood of an ED visit based on the presence of a psychiatric disorder was examined further by Baillargeon and colleagues (2008) in a study sample of 3,257 patients, those with an anxiety disorder ($N = 568$, 45.3%) had the highest portion of return ED visits (Baillargeon et al., 2008). Similarly, Merrick and colleagues (2010) found that among disabled persons with severe psychological distress visiting the ED, 9.5% had major depression and 19.8% were schizophrenic (Merrick et al., 2010). However, among those aged 65 years and results were varied ranging from 5.4% with major depression and 8.6% being schizophrenic

(Merrick et al., 2010). Merrick and colleagues (2010) concluded that among their disabled participants, 82.4% (N=3,574 of 4,335) with a substance-related incident were highly likely to have an ED visit (Merrick et al., 2010). The literature reveals patients with a diagnosis of any psychiatric disorder bear a substantially increased likelihood of an ED visit (Pillow et al., 2013; Crane et al., 2010; Ondler et al., 2014; Sandoval et al., 2010; Slade et al., 2010; Richard-Lepouriel et al., 2015; Minsky et al., 2011). High costs were found among schizophrenia and bipolar disorders with estimates over $70 billion annually (Eaton et al., 2008; CDC, 2013). Cost and disablement estimates continued by Eaton and colleagues (2008) and spanned across the complexity of psychiatric disorders (Eaton et al., 2008). High psychiatric disorder prevalence was found to be correlated with high cost and disablement (Eaton et al., 2008; Han et al., 2011; Minassian et al., 2013; NIAAA, 2015; Nossel et al., 2010). Cost estimates among disorders of interest for the study are detailed within the table below (Eaton et al., 2008):

Table 1

Costs Associated with Mental Disorders

Mental disorder	Annual cost USD (in billions)
Alcohol abuse/dependence	226.0
Drug abuse/dependence	201.6
Major depressive disorder	97.3
Panic disorder	30.4

Gaps and mixed study findings remain in understanding individual ED use for mental health purposes to include socio-demographics, presentation patterns, and patterns of health care utilization and are discussed further in the following section.

Gaps in Understanding Frequent ED Users

Investigating the prevalence and predictors of psychiatric disorders and ED visits within the state of Arizona revealed significant research gaps. Historically, very few researchers have studied how people without health access and with mental illness utilize EDs, frequently visit hospital EDs, or transition among EDs for treatment (Cook et al., 2004; Curran et al., 2003; Dhossche & Ghani, 1998; Friedmann et al., 2001; La Calle & Rabin, 2010; Owens et al., 2010; Pines et al., 2011; Scott et al., 2014; Sun, Burstin, & Brennan, 2003; Washington State Department of Social and Health Services, 2004; Vandyk et al., 2013; Zuckerman & Shea, 2004). Individuals with a mental illness require treatment not often available in the ED to include mental health services, detoxification, and treatment for substance use, as well as case management services for suitable placement in treatment programs (Cook et al., 2014; IOM, 2006; Owens et al., 2010; Pines et al., 2011).

The literature revealed a variation in presenting complaints according to the complexity related to individual comorbidities (La Calle et al., 2013; La Calle & Rabin, 2010; Lunsky et al., 2012; Minsky et al., 2011; Moe et al., 2015; Knowlton et al., 2013). Some previous studies have also shown an underreporting of severity related to substance use disorders (SUD) or mental disorders (Abbott et al., 1994; Garnick et al., 1996; Rockett et al., 2003). Study findings by Rockett et al. (2003) found in their ED administrative data, suggested that 19% of patients received a diagnosis of substance abuse or dependence and 27% were in need of treatment (Rockett et al., 2003). Abbott and colleagues (1994) documented twenty-six studies from 1990 to 2004 of co-occurring disorders, which differed from 84.7% among opiate dependent individuals in treatment

with a mental illness (Abbott et al., 1994) to 4.4% among those who had a primary or

secondary diagnosis of an alcohol or drug dependence (Garnick et al., 1996). Findings by

Garnick et al. (1996) were limited due to underreporting of substance abuse within

medical claims data. Findings by La Calle and Rabin (2010) revealed frequent ED users

were more likely to be seen for treatment in a hospital clinic or have experienced some

change within their usual source of care. Nineteen percent of study participants stated

their medical needs were not met (La Calle & Rabin, 2010). Unmet medical needs are

another independent risk factor associated with an ED visit (La Calle & Rabin, 2010;

Owens et al., 2010; Pines et al., 2011; Scott et al., 2014; Vandyk et al., 2013). These

studies suggest the likelihood of a high prevalence in mental and substance use disorders

and its co-occurrence among individuals presenting to the ED for treatment. The

literature also suggests these patients may be difficult to treat within the ED.

Summary

Chapter 2 introduced a literature review of psychological disorders and their

serious adverse effect upon the ED. Adverse effects of psychiatric disorders contribute to

the burden of disease, mortality and a high prevalence of ED visits (Baillargeon et al.

2008; Fan et al., 2011; Knowlton et al., 2013; Merrick et al., 2010; Minsky et al., 2011;

NIAAA, 2015; Vinton et al., 2014). There are a limited number of published studies

examining the predictors of frequent ED visits and mentally ill individuals. Study efforts

aimed at providing a descriptive epidemiology associated with psychiatric disorder

mortality were continued in the GBD and SAMHSA-NSDUH reports (SAMHSA-

NSDUH, 2014; Theo et al., 2015). The GBD report summarized psychiatric disorder

prevalence and associated mortality necessary for the creation of epidemiologic

knowledge to include the leading source of disease burden, disablement, and costs (Chang et al., 2012; Crane et al., 2012; Han et al., 2011; Minassian et al., 2013; Nossel et al., 2010). The SAMHSA-NSDUH report (2014) studied individual states for SMI prevalence among adults 18 years and older for 2011 and 2012. Additional rankings by state were conducted by Mental Health America (2015) and are included within this chapter.

My study examined year 2013 Arizona Department of Health Services-Population Health and Vital Statistics data for Arizonan's with mental illnesses to determine the factors and combination of factors associated of the frequent ED user. Conducting a factor analysis was necessary to explain the variation and covariation among enabling, predisposing, and need variables among mentally ill Arizonan's presenting to the ED. Given the high comorbidity and prevalence of psychiatric disorders within the state of Arizona, awareness of the problem is of great importance. Determining the underlying factors related to an ED visit among mentally ill Arizonan's satisfies a need within the existing literature pertaining to this serious public health problem of mental health and ED use.

In Chapter 3, I provide information on the methodological components of the study to include the research design and its rationale. A specification of the population and an overview of the independent and dependent variables is included, sampling strategy, inclusion and exclusion criteria for this study, threats to validity and ethical considerations are also discussed.

Chapter 3: Research Method

Introduction

This study was proposed to examine ED use among Arizonans with a mental illness. Prior research findings have identified a profound and growing mental health burden and its negative impact upon EDs. It is essential to understand the magnitude and severity of ED use within this vulnerable group. By pioneering research to determine the impact of the variables under investigation, this study will be a catalyst for the formulation of new research questions. Additionally, results from this study could assist in setting future research priorities and rerouting the direction of valuable resources.

This chapter outlines the research process for this study. The objectives of this study were twofold: to identify the factors (enabling, predisposing and need) that best predict a patient presenting to ED with a mental disorder and what combination, if any, are most predictive of an ED visit. This secondary analysis of Arizona Department of Health Services data identified specific factors related to the outcome of ED utilization to include, patient and hospital characteristics and services, community attributes and resources. All are necessary in order to contribute additional knowledge about this public health issue at the state level.

Determining the underlying factors related to an ED visit was seen as a necessary step towards informing those in practice and administration of ED utilization severity among Arizonan's with a mental disorder. Primary research studies conducted on frequent use of EDs and related characteristics consisted of large sample analyses from national surveys and admissions data. To date, no studies have been conducted to examine variations in healthcare utilization prompting a more concise understanding of

frequent use within this population and the conditions by which they present to the ED. The Arizona Department of Health Services- Population Health and Vital Statistics for FY2013, Mental Health and Emergency Department data was chosen for the study. The selection of this dataset permitted a statistical explanation of the variation and covariation among each measurement and to identify the underlying factors and correlations among the variables.

In this chapter, I provide an overview of the proposed research design related to this study. After providing a brief introduction, I will report the research questions and outline factor analysis. Within the sections to follow, I provide an overview of the sampling strategy, description of the population used for the study, independent and dependent variables, inclusion and exclusion criteria for studies chosen for the dissertation, methodology, threats to validity and ethical considerations.

Research Questions

This study was designed to address two main research questions:

Research Question 1: What factors (enabling, predisposing and need) are associated with whether Arizonan's with a mental illness will present to the ED?

$H_0 1$: There is no association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

$H_1 1$: There is an association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

Research Question 2: What combination of factors (enabling, predisposing and need), if any, is most predictive of frequent ED use?

$H_1 2$: There is no association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

$H_1 2$: There is an association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

Research Design and Rationale

Through this research, I aimed to understand further what underlying factors (enabling, predisposing and need) among Arizona's mentally ill are most predictive of an ED visit. I determined that a quantitative research study approach was best-suited to test the null hypotheses. I employed an exploratory research design. A significant advantage of exploratory research is its flexibility to address research questions of the types what, how, and why (University of Southern California [USC], 2016). This exploratory analysis used secondary data that allowed an examination of patient and hospital characteristics; an exploration of specific psychiatric disorders and factors; and an investigation into the utilization of emergency services for psychiatric treatment. My study supplies evidence-supported information necessary for data-based decisions by practitioners and administrators within Arizona ED. In addition, results from this study could lessen the gaps presently found within public health literature and chart a course for the development of future public health research involving ED use among mentally ill Arizonans. In order to identify the underlying dimensions associated with an ED visit among the independent and dependent variables, determine, and conclude its variation and covariation, a factor analysis technique was employed.

Factor analyses are used to analyze the inter-correlation between variables and then define their variation using factor groups (Field, 2000; Green & Salkind, 2003). A

correlation is a measure of the linear relationship between variables (Gerstman, 2008).

There are numerous ways in which variables could be related: (1) they could be

positively related, (2) not related at all or (3) negatively related (Gerstman, 2008). The

simplest way to examine an association between variables is to examine whether they

covary (Field, 2000; Green & Salkind, 2003). The variance and standard deviation are the

most common measures of spread (Gerstman, 2008). These statistics are based on the

average squared distances of values around the data set's mean (Gerstman, 2008; Green

& Salkind, 2003). As such, the variance is the average error between the mean,

observations, and a measure of how well the model fits the actual data (Field, 2000;

Green & Salkind, 2003). Because variance provides a measurement in units squared, the

square root of the variance determines the measure of average error is in the same units as

the original measure (Field, 2000). This measure is the standard deviation (SD) and is the

square root of variance (Field, 2000; Gerstman, 2008; Green & Salkind, 2003).

Therefore, SD measures how well the mean represents the data (Gerstman, 2008). Small

SDs (relative to the value of the mean itself) indicate that the data points are close to the

mean (Field, 2000; Gerstman, 2008; Green & Salkind, 2003). A large SD (relative to the

mean) indicates that the data points are far from the mean (i.e., the mean is not a true

representation of the data) (Field, 2000; Gerstman, 2008; Green & Salkind, 2003).

Furthermore, in order to overcome the issue of dependence on the measurement scale, I

converted the covariance into a standard set of units, a process known as standardization

(Field, 2000). The process of SD ensured all results could be easily compared to one

another.

Before conducting the correlational analysis it was necessary to include a scatterplot in order to examine the general trend of the data. A scatterplot is a graph that plots each participant's score on one variable against their score on another (Field, 2000; Gertsman, 2008; Green & Salkind, 2003). A scatterplot reveals a number of things about the data including whether there appears to be a relationship among the variables, what type of relationship it is and if there are cases substantially different from the others (Field, 2000; Green & Salkind, 2003). Any case differing substantially from the general trend of the data are outliers and such cases can greatly bias the correlation coefficient (Field, 2000; Gerstman, 2008). The inclusion of a scatterplot reveals if any cases look like outliers in addition to yielding the general trend of the data.

Correlations among the variables can be identified using the correlate procedure in SPSS to create a correlation matrix of all variables. Analyzing the correlation matrix is a very beneficial default method as it takes the standardized form of the matrix (Field, 2000; Green & Salkind, 2003). Since my variables have been measured utilizing different scales, this did not affect the analysis. Analyzing the correlation matrix ensures any differences within the measurement scales are accounted for (Field, 2000; Green & Salkind, 2003). Hence, during this early stage, I sought to eliminate any variables that did not correlate with any other variables or that correlated very highly with other variables ($R < .09$). An additional problem arises when variables correlate too highly. Since mild multicollinearity is not problematic for the factor analysis method it was important to avoid extreme multicollinearity (i.e., variables that are very highly correlated) and singularity (variables that are perfectly correlated) (Field, 2000; Gerstman, 2008; Green & Salkind, 2003). Seen in regression analysis, singularity is problematic in factor

analysis because it becomes difficult to conclude the unique contribution to a factor of the variables that are highly correlated (Field, 2000; Gerstman, 2008; Green & Salkind, 2003). Therefore, the creation of a correlation matrix is a main component of factor analysis, critical to this study and is discussed further in the next section.

There are a number of ways to explore study data further by employing the factor analysis technique. When initially created, it was thought factor analysis would be used to explore data and stimulate future research (Field, 2000). The factor analysis method extracts maximum common variance from all variables and places them into a common score. This technique may be conducted directly on the correlation between the variables (Field, 2000). An analysis of this type identifies factors that statistically explain the variation and covariation among what is being measured (Field, 2000; Salkind & Green, 2003). Any existence of clusters of large correlation coefficients among subsets of variables implicates measuring features composed of identical underlying dimensions (Field, 2000; Salkind & Green, 2003). The underlying dimensions are identified as factors or latent variables (Field, 2000).

By reducing the data set from a group of interrelated variables into a smaller set of uncorrelated factors, factor analysis explains the maximum amount of common variance in a correlation matrix using the smallest number of explanatory instances (Field, 2000). This data reduction is accomplished by looking for variables that correlate highly with a group of other variables but do not correlate well with variables outside that group (Field, 2000). Usually, the number of factors is substantially smaller than the number of measures and, as a consequence, the factors succinctly represent a set of measures (Salkind & Green, 2003). As such, factor analysis can be seen as a data-

reduction technique because it reduces large numbers of coinciding measured variables to a much smaller set of factors (Salkind & Green, 2003).

Variables undergoing analysis for this study were quantitative and consisted of a wide range of scores. Specific components subjected to further measurement include (ENAB_PAYER, PREDIS_SEX, PREDIS_RACE, PREDIS_AGE, and NEED_MENTAL_DISORDER) as the predictor variables. The outcome variable was healthcare utilization, specifically ED_VIST. Further, in order to conduct this complex analysis two steps must be completed, factor analysis and factor rotation. The main objective of the first area involves making an initial decision regarding the number of factors underlying a set of measured variables (Salkind & Green, 2003). The goal of the second area is twofold: to statistically act upon (i.e., to rotate factors) the results to make the factors more interpretable and to make final determinations about the number of underlying factors (Field, 2000; Salkind & Green, 2003). Both factor extraction and factor rotation are discussed in more detail in the upcoming sections.

Factor analysis is concerned with finding common underlying dimensions within the data (Field, 2000; Green & Salkind, 2003). For this step within the research study I was primarily interested in the common variance. It is essential to understand how much variance is present before running the factor analysis (Field, 2000). Hence, it was necessary to estimate the amount of common variance by estimating communality values for each variable (Field, 200). Numerous methods for estimating communality exist, however, the most commonly utilized (to include Statistical PSS) is squared multiple correlation (SMC) of each variable with all others (Field, 2000; Gerstman, 2008; Green & Salkind, 2003). For this study I anticipate utilizing multiple regression using one

measure (EDVSIT) as the outcome and the other measures ENAB_PAYER,

PREDIS_SEX, PREDIS_RACE, PREDIS_AGE, NEED_MENTAL_DISORDER as the

predictors. The resulting multiple R^2 will be utilized as an estimate of the communality

for the variable EDVSIT. The estimates will then allow for the factor analysis to be

performed.

The interpretation of factors is greatly improved through rotation. Rotation

increases the loading of each variable on one of the extracted factors while minimizing

loading on what remains (Field, 2000; Green & Salkind, 2003). A number of rotation

techniques exist to include orthogonal and oblique methods. Varimax, quartimax and

equamax are all orthogonal rotations while direct oblimin and promax are oblique

rotations (Field, 2000; Green & Salkind, 2003). Selecting correct type of rotation depends

greatly on whether or not the researcher believes the underlying factors would be related.

Since were grounds for supposing the study factors may correlate, the direct oblimin, an

oblique rotation method was chosen. Oblique rotations are more complex because

correlation between factors is permitted (Field, 2000). With its use, the degree to which

factors are allowed to correlate is determined by the value of delta (Field, 2000; Green &

Salkind, 2003). The default was set to zero and ensured that a high correlation between

factors did not occur. Setting delta greater than zero (up to 0.8) would yield highly

correlated factors while performing the opposite function (down to -0.8), would yield less

correlated factors (Field, 2000; Green & Salkind, 2003). In this case, the default setting

was left at zero as is recommended for most analyses.

Correlation coefficients may differ from sample to sample, more so in smaller

samples than a larger one (Field, 2000). Therefore, the reliability of factor analysis is also

dependent on sample size (Field, 2000). Generally, sample sizes of 300 or more is

adequate, however, communalities after extraction should be above 0.5 (Field, 2000). By

default SPSS lists variables in order in which they are entered into the data editor.

Although this format is often convenient, when interpreting factors it is more useful to

list variables by size (Green & Salkind, 2003). By selecting Sorted by size, SPSS will

order the variables by their factor loadings (Green & Salkind, 2003). The option to

suppress absolute values less than a specified value was chosen (by default 0.1).

Selecting this option that factor loadings within ±0.1 are not displayed in the output

(Green & Salkind, 2003). This option is useful for assisting in interpretation; however it

can be useful to increase the default value of 0.1 to either 0.4 or a value reflecting the

expected value of a significant factor loading given the sample size (Field, 2000; Green

& Salkind, 2003). For this study I have requested from SPSS that all loadings less than

0.1 be suppressed in the output.

Multiple regression/correlation analyses are extensions of bivariate

regression/correlation analyses and related to partial correlation analysis (Gerstman,

2008; Green & Salkind, 2003). The multiple correlation (R) is a strength-of-relationship

indicating the degree that the predicted scores are correlated with the Y scores (observed

scores) for the sample (Gerstman, 2008; Green & Salkind, 2003). For the second research

question, multiple correlation indices will be utilized to assess the overall effect of the

predictors on the dependent variable, ED_VIST. SPSS will compute a multiple

correlation (R^2) and an adjusted squared multiple correlation (R^2adj) (Gerstman, 2008;

Green & Salkind, 2003). All three indices assess how well the linear combination of

predictor variables in the regression analysis predicts the criterion variable (Gerstman,

2008; Green & Salkind, 2003). SPSS also calculates changes in R² if there are blocks or multiple sets of predictors (Green & Salkind, 2003).

The statistic R ranges in value from 0 to 1 (Gerstman, 2008; Green & Salkind, 2003). A value of 0 states no linear relationship exists among the predicted scores and the criterion scores (Gerstman, 2008; Green & Salkind, 2003). A value of 1 indicates that the linear combination of the predictor variables perfectly predicts the criterion variable (Gerstman, 2008; Green & Salkind, 2003). Values ranging from 0 and 1 reveal a less than perfect linear relationship among the predicted and criterion scores (Gerstman, 2008; Green & Salkind, 2003). The second research question related to this study will employ a multiple regression analysis with one set of predictors of the following variables: ENAB_PAYER (SELF_, PRVT_INSUR_, AHCCCS-MEDICAD_, IHS_, OTHR_) and ED_VIST, PREDIS_SEX (MALE_, FMALE_) and ED_VIST and PREDIS_AGE (0_19_,20_44_, 45_64_, 65+_), PREDIS_RACE (NATIVE_, ASIAN_, BLK_, HISP_, WHITE_, OTHR_, UNKNWN_) and ED_VIST. An overview of test options chosen for the study by research question and selected variables is detailed within Table 2.

Table 2

Test by Research Question Correlation Matrix

Research Questions	Variables	SPSS Test
What factors (enabling, predisposing and need) predict whether Arizonan's with a mental illness will present to the ED?	Independent: ENAB_PAYER, PREDIS_SEX, PREDIS_AGE, PREDIS_RACE, NEED_MENTAL_DISORDER Dependent: ED_VIST	Analyze-Data Reduction: Analyze- Data Reduction- Factor Descriptives- R-matrix- Significance- Determinant Factor Extraction: Extract- Correlation matrix- Method- Maximum likelihood- Extract- Eigenvalues over (1) Factor Rotation: Analyze-Data Reduction-Factor-Extraction-Number of factors-Maximum likelihood-Scree plot-Rotation-Direct oblimin-Continue-Descriptives- Correlation Matrix- Select-Coefficients-Significance levels-Determinant-Select-Univariate descriptives-Select-Continue-OK. Continued

Research Questions	Variables	SPSS Test
What combination of factors (enabling, predisposing and need), if any, is most predictive of the frequent ED user?	ENAB_PAYER, PREDIS_SEX, PREDIS_AGE, PREDIS_RACE AND ED_VIST	Multiple Regression with One Set of Predictors: Analyze-Regression- Linear- ED_VIST (Dependent) box Select Independent Variable Set for Each Analysis

Time and Resource Constraints

Time and resource constraints were faced while conducting the proposal. Obtaining all applicable research documentation within a reasonable time frame presented a challenge. Gaining access to many peer-reviewed works was met with high cost not available within the allotted budget. In order to overcome the financial barriers attached to accessing some relevant studies, I contacted the Walden librarians and submitted requests for copies of the studies via the document delivery system. Five remaining resources were identified and accessed with assistance from local librarians from Emory and Grand Canyon Universities. An unexpected constraint was experienced during this time as a small number of related works were identified but not produced in English. I determined based on the amount of time needed to translate and established inclusion and exclusion criteria, translating multiple studies was not feasible.

Methodology

Population of Study

Consistent with the requirements defined within Arizona Revised Statutes (A.R.S.), 36-3415, the Arizona Department of Health Services, Division of Behavioral Health Services (ADHS-DBHS), completed its review of members diagnosed with a Serious Mental Illness (SMI) who received behavioral health services during State Fiscal Year (FY) 2014. This report was included because it summarizes the identified areas undergoing further examination for this study included, population demographics, service utilization and expenditures, tracking of high cost beneficiaries and mortality trends. The ADHS-DBHS report was identified as an authoritative resource and best-suited to

accurately provide a summary of the Arizona population chosen for this study. Arizona's

SMI population characteristics are outlined further within the following sections.

Demographics. During FY 2014, there were 40,381 members with an SMI

diagnosis spanning across the state's four Regional Behavioral Health Authorities

(RBHAs) (ADHS-DBHS, 2014). The DBHS provides services for those eligible for Title

XIX or Title XXI benefits (ADHS-DBHS, 2014). This subset populace are often referred

to as "AHCCS-eligible" since their services are mostly funded through the Arizona

Health Care Cost Containment System, the state's Medicaid authorizer (ADHS-DBHS,

2014). In FY 2014, AHCCS- eligible persons were the majority of enrolled members at

77.5%, followed by remaining Non-AHCCS eligible members consisting of 22.5%

(ADHS-DBHS, 2014). As detailed within Table 3, most of Arizona's SMI enrollees are

within Maricopa County (47.7%) with the remaining 52.3% of enrollees located in other

Geographic Service Areas (GSA) across the state (ADHS-DBHS, 2014).

Table 3

FY 2014 SMI Enrollment Overview

Counties	Tribal/Regional Behavioral Health Authority (Geographic Service Area)	Eligibility Title XIX	Eligibility Title XXI	Enrolled members SMI Diagnosis	Percent Statewide SMI Population
Apache Coconino Mohave Navajo Yavapai	Northern Arizona Regional Behavioral Health Authority (NARBHA- GSA 1)	4,607	1,419	6,026	14.9%
La Paz Yuma	Cenpatico Behavioral Health Services of Arizona (GSA 2)	739	92	831	2.1%
Cochise Graham Greenlee Santa Cruz	Cenpatico Behavioral Health Services of Arizona (GSA 3)	738	125	863	2.1%
Gila Pinal	Cenpatico Behavioral Health Services of Arizona (GSA 4)	1,135	292	1,427	3.5%
Pima	CPSA (GSA 5)*	9,486	2,476	11,962	29.6%
Maricopa	Magellan of Arizona/Mercy Maricopa Integrated Care (GSA 6) **	14,594	4,678	19,272	47.7%

** As of October 1, 2015, Centene replaced CPSA as the Regional Behavioral Health Authority for GSA 5 in Arizona.

Counties	Tribal/Regional Behavioral Health Authority (Geographic Service Area)	Eligibility Title XIX	Eligibility Title XXI	Enrolled members SMI Diagnosis	Percent Statewide SMI Population
Statewide		31,299	9,082	40,381	100.0%

*As of April 1, 2014, Mercy Maricopa Integrated Care (MMIC) replaced Magellan as the Regional Behavioral Health Authority for GSA 6 in Arizona.

Age and Sex. According to the Substance Abuse and Mental Health Services Administration (SAMHSA) (2012), the SMI population is comprised of more females than males at both state and national levels (SAMHSA, 2012). Within the state of Arizona, 55.7% of members with an SMI diagnosis are female and 44.3 are male (AZDHS-DBHS, 2014b). Gender rates for those with SMI residing within Greater Arizona and Maricopa County, the state's largest county are similar to statewide proportions (AZDHS-DBHS, 2014b). Furthermore, almost one-third (31.1%) of members with an SMI diagnosis are aged 31 to 45, 21.7% are 55 years of age or older and 15.7% aged 18 to 30 years old (ADHS-DBHS, 2014b). Throughout Arizona during FY 2014, the median age of the enrolled SMI populace was 47.6 years (ADHS-DBHS, 2014b). For Non-AHCCCS eligible members with SMI have a slightly higher median age of 53.8 years with AHCCCS-eligible members with SMI at 45.6 years (ADHS-DBHS, 2014b).

Race and ethnicity. Self-identified race and ethnicity data reveals a predominantly White representation within the state of at 88.1%, followed by its largest minority group, Hispanic/Latino (18.1%), Blacks (7.5%), Native Americans (1.9%) and those identifying with more than one race (1.1%).

Education and employment. A greater proportion of individuals with an SMI diagnosis residing within Maricopa County had attended school or some form of vocational program when compared to their counterparts throughout Greater Arizona (ADHS-DBHS, 2014). Approximately 14.3% of members with SMI are employed either full or part-time, 16.4% in Maricopa County and 12.3% of Greater Arizona members are employed (ADHS-DBHS, 2014).

Recent arrests. Two percent of AHCCCS-eligible members with SMI were arrested during FY 2014 compared to 1.1% of Non-AHCCCS eligible members (ADHS-DBHS, 2014). A larger proportion of males (8.8%) nearly doubled with recent arrests when compared to their female counterparts at 5.1%, statewide.

Homelessness. About 3.8% of members with an SMI diagnosis were homeless in FY 2014 (ADHS-DBHS, 2014). Males comprised a greater percentage of homelessness than females (5.3% and 2.8%, respectively).

Income. Income data was not collected for members during FY 2014, however for this report DBHS requested from each RBHA to submit income data for its members with SMI (ADHS-DBHS, 2014). Based on this request, each RBHA pulled samples from their current SMI population. Table 4 reflects income data listed by the total number of members, sample, GSA, Title XIX or Non-TXIX and mean.

Table 4

SMI Member Income by Sample

Region	Total SMI	Sample size	Mean income
GSA 1: NARBHA			
Title XIX	4,072	264	$7,374
Non-TXIX	1,411	95	18,229
RBHA Total	5,483	359	10,246
GSA 2-4: Cenpatico			
Title XIX	2,582	93	$685
Non-TXIX	534	82	1,402
RBHS Total	3,116	175	1,021
GSA 5: CPSA			
Title XIX	8,287	68	$769
Non-TXIX	3,131	67	1,331
RBHA Total	11,418	135	1.048
GSA 6: Magellan/MMIC			
Title XIX	18, 148	420	$5,183
Non-Title XIX	5,028	405	11, 696
RBHA Total	23,176	825	16,879

Sampling and Sampling Procedures

A secondary analysis of quantitative data from statistics on discharges from Arizona hospitals will support representativeness of the population. Data from the Population Health and Vital Statistics, FY 2013: Hospital Inpatient Discharges & Emergency Room Visits Statistics, Mental Health Disorders, was identified as the best dataset for the study. Hospital inpatient discharge data were originally collected by the

Cost Reporting and Discharge Data Review Section (AZDHS-DBHS, 2014b). The data only represent Arizona residents with all county-level data reflecting the patient's zip code, not the hospital's location (AZDHS-DBHS, 2014b). Federal, military and the Department of Veteran Affairs hospitals are omitted from the original data collection. ED data included only those who were not admitted as inpatients (AZDHS-DBHS, 2014b).

The original purpose for data collection by AZDHS-DBHS was for discharges (AZDHS-DBHS, 2014b). Discharge data collection now includes various categories to include mental disorders (AZDHS-DBHS, 2014b). The sample is distinguished among first-listed and all-listed diagnoses (AZDHS-DBHS, 2014b). The number of first-listed diagnoses is the same as the number of discharges (AZDHS-DBHS, 2014b). The discharge record may include more than one diagnosis of specific psychotic or neurotic conditions (e.g., anxiety, depression and drug dependence), but also a combination of diagnostic categories for both psychotic and neurotic conditions (e.g., manic depressive disorder and anxiety and abuse of drugs) (AZDHS-DBHS, 2014b). When counting all-listed diagnoses the sum of all occurrences of psychotic and neurotic disorders is greater than the total number of discharges with mental disorders (AZDHS-DBHS, 2014b). Additional information within the dataset includes total gross charges incurred by patients and the expected source of payment for those charges (AZDHS-DBHS, 2014b). Charges could include services in addition to treating mental disorders (AZDHS-DBHS, 2014b).

Probability sampling uses randomization and takes steps to ensure all members of the population have a chance of being selected (Gertsman, 2008; Green & Salkind, 2003).

One variation of this type of sampling used within the study cluster random sampling (Statistics Solutions, 2016). A cluster analysis is an exploratory investigation that attempts to identify structures within the data (Statistics Solutions, 2016). This form of probability sampling attempts to identify homogenous groups, (e.g., cases, observations, participants) (Gerstman, 2008; Statistics Solutions, 2016). Due to its exploratory nature, this type of analysis does not make any difference among the dependent and independent variables (Statistics Solutions, 2016). SPSS is capable of processing a number of cluster analysis methods to include binary, nominal, ordinal and scale (interval or ratio) data (Statistics Solutions, 2016).

Cluster analysis is commonly part of the sequence of analyses of factor, cluster and discriminant analyses (Statistics Solutions, 2016). A factor analysis will decrease the dimensions and the number of variables making it easier to run the cluster analysis (Field, 2000; Gerstman, 2008; Statistics Solutions, 2016). Additionally a factor analysis reduces multicollinearity effects (Field, 2000; Gerstman, 2008; Statistics Solutions, 2016). A discriminant analysis determines the goodness of fit of the model the cluster analysis identifies and profiles the clusters (Statistics Solutions, 2016). The discriminant analysis will follow the cluster analysis as it lacks the goodness of fit measures or tests of significance (Statistics Solutions, 2016). This does not ensure the groups are meaningful, therefore interpretation and selecting the correct clustering relies greatly upon the researcher (Statistics Solutions, 2016).

In SPSS, cluster analysis is located under Analyze/Classify (Green & Salkind, 2003). The hierarchical method was selected as it is commonly placed for research of this

type (Statistics Solutions, 2016). Although this method requires more time to calculate, it generated a series of models with cluster solutions from I (all cases in one cluster) to n (all cases are an individual cluster) (Statistics Solutions, 2016). The hierarchical method also work with variables, clustering them together in a way very similar to factor analysis (Green & Salkind, 2003; Statistics Solutions, 2016).

For the power analysis required for this study it was necessary to calculate sample size, alpha level and power level. The G*Power (version 3.0.10) calculator is a straightforward and very powerful tool and utilized for this analysis (University California Los Angeles, 2016). Since this study was concerned with the effect from predictor correlations, the Exact test: Multiple Regression-random model was selected. This selection enabled the calculating tool to compute from the matrix of correlation among the predictor variables. Based on nine predictors, results from G*Power determined a sample size of N = 1,613, an alpha level of 0.05 and actual power of 0.95.

<div align="center">**Threats to Validity**</div>

The use of a secondary analysis introduces threats to study validity. (Creswell, 2013). Threats related to this study included internal validity, statistical conclusion validity and external validity. Threats to study validity are discussed in the upcoming sections.

Internal Validity

Internal validity threats compromise any confidence in determining whether a relationship exists among the independent and dependent variables. Selection bias was identified as an internal threat to study validity. Nonsampling errors such as selection bias

include a systematic tendency to omit one kind of unit from the sample (Gerstman, 2008; Statistics Solutions, 2016b). Since this study employed probability sampling, this form of bias was minimalized.

Statistical Conclusion Validity

Statistical conclusion validity arises when incorrect inferences are drawn from the data because of inadequate statistical power or a violation of statistical assumptions (Creswell, 2013; Gerstman, 2008). The possibility of such threats required an assessment of the choice of statistical instrument chosen among the primary studies reviewed during the literature review. As it was identified as an accurate statistical tool necessary to determine the calculation of effect size and power, I used G*Power for this analysis.

External Validity

External validity threats surface when researchers draw inaccurate inferences from the sample data to other persons, settings, and past or future situations (Creswell, 2013). This study generalized results to the mentally ill population and ED. Research chosen for inclusion within this study did not include those from foreign countries, which could have introduced an external threat. Given this, an extensive literature search was conducted to ensure academic integrity for this study.

<div align="center">

Ethical Procedures

</div>

Anticipated ethical issues do not end with data collection and analysis. It is important to correctly implement the code of ethics and extend this high moral behavior into the actual writing of the dissertation. Because this study is a secondary data analysis, confidentiality and anonymity were both insured early. The AZDHS-DBHS dataset and editors of all published work included into the study have taken steps to ensure privacy to

include the Health Insurance Portability and Accountability Act (HIPAA) were upheld.

Data collection and analysis included survey and admission data coded and recorded as to

disassociate individuals from the responses provided. Although the dataset chosen for this

study is publicly available, because I have a version of it now in my possession, it will be

held safely in a password encrypted file protected by Mcafee-Intel Corporation®.

Furthermore, the American Psychological Association's Ethical Principles of

Psychologists and Code of Conduct written in 1992 and its Sixth Edition Publication

Manual, specifically, its general guidelines for reducing bias and reducing bias by topic

were precisely followed.

Summary

This chapter provided an overview of the research design, sampling strategy,

research questions, and relevant issues related to ED use. An exploratory research design

was chosen due to their being no prior studies conducted on healthcare utilization among

mentally ill Arizonans. The exploratory research design allows for additional insight into

a problem and is highly versatile and works well with research questions of all types

(USC, 2016). This exploration consisted of an extensive search strategy with specific

criteria for the inclusion and exclusion of studies was employed. Research databases such

as Pub Med, MEDLINE and PsychINFO, were utilized to obtain primary studies for

inclusion into the study. While undertaking the review of journal articles, the abstracts

were first read to determine whether it met the study standards. Significant statistical

features including G*Power analysis and effect size computation were also discussed.

Moreover, threats to study validity and ethical considerations were highlighted.

Chapter 4: Results

Introduction

This study was a secondary quantitative analysis of a large data set, the Arizona Department of Health Services, Division of Behavioral Services [AZDHS-DBS], ED discharge data FY2013. Andersen's BM served as the conceptual framework. The purpose was to determine which factors (if any) are the best predictors of an ED visit and to identify the underlying dimensions by which Arizonans with a mental illness present to the ED. The independent study variables included enabling (payer), predisposing (gender, age, and race), and need, specifically, the reason for visiting the ED (i.e., bipolar, schizophrenia, alcohol disorder, and major depressive disorder). The dependent variable was ED visit.

The research study questions were:

Research Question 1: What factors (enabling, predisposing and need) are associated with whether Arizonan's with a mental illness will present to the ED?

$H_0 1$: There is no association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

$H_1 1$: There is an association between the factors (enabling, predisposing and need) among Arizonan's with a mental illness presenting to the ED.

Research Question 2: What combination of factors (enabling, predisposing and need), if any, is most predictive of frequent ED use?

$H_1 2$: There is no association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

$H_1$2: There is an association in the combination of factors (enabling, predisposing and need) among the frequent ED user.

Data Collection

The data used for the study were retrieved from the AZDHS-DBS, FY2013. During this year, there were 994,600 ED visits captured by the division. Arizona residents presenting with either an emergency for visiting the ED were included. In addition, cases with ICD-9-CM codes ranging from 290-319 which fell under five major DSM characteristics of serious mental illness (SMI) were also incorporated into the study sample. After sequestering cases meeting the aforementioned criteria, 40, 381 cases were secluded. From this sample, 1,613 cases were randomly selected using SPSS version 21.0 for further examination by factor analysis.

Results

Descriptive Statistics

During FY 2014, there were 40,381 members with an SMI diagnosis spanning across the state's four Regional Behavioral Health Authorities (RBHAs) (ADHS-DBHS, 2014). The DBHS provides services for those eligible for Title XIX or Title XXI benefits (ADHS-DBHS, 2014). This subset populace are often referred to as 'AHCCS-eligible' since their services are mostly funded through the Arizona Health Care Cost Containment System, the state's Medicaid authorizer (ADHS-DBHS, 2014). In FY 2014, AHCCS-eligible persons were the majority of enrolled members at 77.5%, followed by remaining Non-AHCCS eligible members consisting of 22.5% (ADHS-DBHS, 2014). As detailed in Table 5, most of Arizona's SMI enrollees were within Maricopa County (47.7%) with the

remaining 52.3% of enrollees located in other Geographic Service Areas (GSA) across

the state (ADHS-DBHS, 2014).

Table 5

FY 2014 SMI Enrollment Overview

Counties	Tribal/Regional Behavioral Health Authority (Geographic Service Area)	Eligibility Title XIX	Eligibility Title XXI	Enrolled Members SMI Diagnosis	Percent of Statewide SMI Population
Apache Coconino Mohave Navajo Yavapai	Northern Arizona Regional Behavioral Health Authority (NARBHA- GSA 1)	4,607	1,419	6,026	14.9%
La Paz Yuma	Cenpatico Behavioral Health Services of Arizona (GSA 2)	739	92	831	2.1%
Cochise Graham Greenlee Santa Cruz	Cenpatico Behavioral Health Services of Arizona (GSA 3)	738	125	863	2.1%
Gila Pinal	Cenpatico Behavioral Health Services of Arizona (GSA 4)	1,135	292	1,427	3.5%
Pima	CPSA (GSA 5)*	9,486	2,476	11,962	29.6%

Continued

Counties	Tribal/Regional Behavioral Health Authority (Geographic Service Area)	Eligibility Title XIX	Eligibility Title XXI	Enrolled Members SMI Diagnosis	Percent of Statewide SMI Population
Maricopa	Magellan of Arizona/Mercy Maricopa Integrated Care (GSA 6) **	14,594	4,678	19,272	47.7%
Statewide		31,299	9,082	40,381	100.0%

* As of April 1, 2014, Mercy Maricopa Integrated Care (MMIC) replaced Magellan as the Regional Behavioral Health Authority for GSA 6 in Arizona.

** As of October 1, 2015, Centene replaced CPSA as the Regional Behavioral Health Authority for GSA 5 in Arizona.

AZDHS-DBS ED discharge data were examined for the study. All variables must have had an emergent or urgent visit to be considered for further analysis. The sample size was reduced from 994, 600 to 40,381. Based on G*Power sample sizing results, the population was further reduced to 1,613 by randomization. A significant percentage of individuals within the sample visited a hospital ED for an emergent or urgent reason (1595, 98.9%). Women represented the largest gender group with men slightly behind. This is presented below in Table 6.

Table 6

Urgent ED Visit by Sex

Sex	Total
Female	876
Male	737

Table 7 presents the ethnic groups that are represented within the sample.

Table 7

Urgent ED Visits by Race/Ethnicity

Race/Ethnicity	Total
Native Americans	78
Asians	14
African Americans	100
Hispanics	501
Non-Hispanic Whites	897
Native Hawaiian/Pacific Islander	2
Other	4
Refused	17

Ethnic groups represented within the sample included a majority of White ED visitors, followed by Hispanics, African-Americans, Native-Americans, Asians and

Native Hawaiian/Pacific Islanders. Additionally represented from within this sample were 4 individuals identifying themselves as other ethnicity and 17 who refused to provide data regarding their ethnicity.

The payer type is presented in Table 8.

Table 8

Urgent ED Visits by Payer Type

Payer Type	Total
AHCCCS	519
Self-Pay	279
HMO	222
Medicare	218

Charges related to the visit were covered for most of the sample by Arizona Healthcare Cost Containment System [AHCCCS], the State's Medicaid system (06) (519, 32.2%), followed by self-pay (00) (279, 17.3%), HMO (02) (222, 13.7%), and original Medicare (05) (218, 13.5%).

The age of visitor is presented in Table 9. Age ranged from 0 to 90+ with individuals 20-29 (260, 16.1%) representing the largest age group.

Table 9

ED Visit by Age Range

Age	Total
0-9	248
10-19	175
20-29	260
30-39	214
40-49	217
50-59	190
60-69	148
70-79	85
80-89	60
90+	16

Mental disorder upon ED visit was poorly represented within the sample. Individuals with a mental disorder and a DSM classification ranging from 290-319 represented 0.027% (44 cases). Most individuals within the sample once released from the ED were discharged with orders to their home and/ or self-care (1,521, 94.3%).

Discovering Factors

This study employed factor analyses techniques for exploring the AZDHS-DBS dataset. The dimensionality of seven items from the ED measure (emergent or urgent reason) were analyzed using maximum likelihood factor analysis, an exploratory technique. Because the study sample size exceeded 250, two criteria were used to determine the number of factors to rotate: the scree test and the interpretability of the factor solution. The scree plot, presented in Figure 1, displays the eigenvalues with loadings ≥0.70 and reveals the relative importance of each factor.

Scree Plot

Figure 1. Scree plot of components and eigenvalues.

The scree test shows two factors with quite high loadings (>1), a single factor with an eigenvalue of one, and two moderately high factors (0.960, 0.758) respectively. Results from this analysis revealed five items should be retained for factor rotation. A key variable under analysis, mental health disorder was deficient with 44 cases and failed to load with an eigenvalue greater than or equal to one.

The results of component analysis and matrix are presented in Table 10.

Table 10

Principle Component Analysis and Matrix of Variables

Variable	Initial Eigenvalues		Extracted Sums of Squared Loadings		Rotation Sums of Squared Loadings		Component Matrix [ab]		
	Table	% of Variance	Table	% of Variance	Table	% of Variance	1	2	3
Age	1.170	23.404	1.170	23.404	1.143	22.864	.777		
Sex	1.112	22.236	1.112	22.236	1.135	22.709			.419
Race	.758	15.155					.402	.755	
Payer	.954	19.082					.480	-.656	
Discharge	1.006	20.124	1.006	20.124	1.009	20.190			.882

Extraction Method: Principal Component Analysis.
a. 3 components extracted.
b. Only cases for which PRIORITY_OF_VISIT = 1 are used in the analysis phase.

Research Question 1

What factors (enabling, predisposing, and need) are associated with whether Arizonan's with a mental illness will present to the ED? To address Research Question 1, I used SPSS, which displays the eigenvalues associated with each linear component (factor) before extraction, after extraction, and after rotation. The eigenvalues associated with each factor represented the variance explained by the particular linear factor. SPSS also displays the eigenvalues in terms of the percentage of variance explained. Displayed in Table 10, Factor 1, Age, accounted for the largest amount of the total variance (23.404%) with an eigenvalue of 1.170. Factor 2, Sex, explained 22.236% of the total variance and had an eigenvalue of 1.112. The third factor, Discharge accounted for 20.124% of the total variance with an eigenvalue of 1.006. Factor 4, Payer, explained 19.082% of the total variance with an eigenvalue of 0.954. This was followed by the last extracted variable, Factor 5, Race which accounted for the smallest amount of the total variance (15.155%) and an eigenvalue of 0.758.

Seen in Table 10, the eigenvalues associated with these factors are shown within the column labelled *Extraction Sums of Squared Loadings*. The values within this portion of the table are the same as the values before extraction with the exception of the values for the discarded factors which were disregarded during analysis. In the final portion of the table titled, *Rotation Sums of Squared Loadings,* the eigenvalues of the factors after rotation are displayed. Prior to rotation, factor 1 accounted for slightly more variance than the remaining two (23.404% compared to 22.236 and 20.124%), however, after rotating the factors it accounts for 22.864% of variance (compared to 22.709 and 20.190

respectively). In total, three factors, (age, sex, and discharge) accounted for 65.763% of the variable variance.

Using SPSS, I extracted all factors with eigenvalues >1 leaving three factors, age, sex, and discharge status. Because mental disorder was not strongly represented within the sample (0.027%), the factor was deficient and not extracted by factor analysis. As previously discussed within Chapter 2, the following SMI conditions were identified during the literature review and included within the study: schizophrenia, paranoid and other psychotic disorders, bipolar disorder, and major depressive disorder. Disorders relevant to the study and within the reduced, randomized dataset totaled 44 cases and were as follows: anxiety disorders (n=17), substance abuse disorders (n=18), mood disorders (n=7), and impulsive control disorders (n=2).

By default, SPSS does not provide significance results for very small factor loadings, regardless of a large sample size. The variable, mental disorder was key to this study and due to the very small number of cases, not generalizable. Further support for a lack of generalizability is shown within the scree plot (Figure 1). Results following the scree test did not indicate an extracted factor loading (≥1) for the variable mental disorder. This provided additional evidence against the question presented in Research Question 1 as lacking the representativeness necessary to adequately answer this question.

RQ2- What combination of factors (enabling, predisposing and need), if any, is most predictive of the frequent ED user?

To address Research Question 2, factor rotation methods utilizing the Varimax option in SPSS was inputted. Because this was an exploratory, first analysis of FY2013 AZDHS-DBS data, use of the Varimax method simplified the interpretation of factors. As revealed within Research Question 1, prior to rotation three factors (age, sex, and discharge) accounted for 65.763% of the total variance among all five extracted variables for ED visits. However, the communalities shown in Table 11 reveal three slightly different factors ≥0.70 (discharge, payer, and race). These communalities show the proportion of common variance within the variable (Field, 2009). Before extraction communalities are all 1 (see column labelled *Initial*). Upon extraction of the factors the amount of true common variance is displayed. Most of the common variance among individuals visiting the ED for an emergent or urgent need were discharged home or received orders for self-care (82.7%). Remaining common variance revealed after extraction included race (74.3%), payer (69.5%), and age (62.7%), and sex (39.6%).

Table 11

Communalities

Variable	Communalities	
	Initial	Extraction
Age	1.000	.627
Sex	1.000	.396
Discharge Status	1.000	.827
Payer Type	1.000	.695
Race/Ethnicity	1.000	.743

The five retained factors did not explain all of the variance presented in the data but did provide some explanation. Upon closer analysis, it was determined Research

Question 2 would be best explained by the common, or shared variance by the underlying factors after rotation. The amount of variance in each variable by the retained factors are represented by the Communalities after extraction (Table 11), Component Matrix (Table 12), and the Rotated Component Matrix (Table 13).

Table 12

Component Matrix

Variable	Component		
	1	2	3
Age	.777		
Race/Ethnicity	.402	.755	
Payer Type	.480	-.656	
Discharge Status			.882
Sex			.419

The first component matrix presented in Table 12 shows the unrotated solution. This matrix contains the loading of each variable onto each factor. By default, SPSS displays all loadings, however within this output it was requested that all loadings < 0.4 be suppressed in the output so there are blank spaces for many of the loadings. Although this matrix is not particularly significant for interpretation, it is important to note that prior to rotation variables loading associated with Factor 1, age and ED visit included race ($r = .40$) and payer ($r = .48$). Both variables indicated a moderately strong, positive relationship. Age and ED visit were strong and positively correlated ($r = .78$). This also provides an explanation for why age accounted for the most variance.

Factor 2, sex and ED visit revealed a strong, positive correlation with race ($r = .75$) however, there was a moderately strong, negative correlation for payer ($r = -.65$).

The third factor, discharge and ED visit were moderate in strength and positively correlated with sex ($r = .42$). Additionally, discharge associated with ED visit revealed a very strong, positive relationship ($r = .89$). Discharge also accounted for a significant amount of the initial total variance (20.124%). Prior to rotation, components that best predicted an ED visit within this sample included the predisposing variables, age, sex, and race. Discharge is also noted not as a predictor of an emergent or urgent ED visit, but as variable contributing to the total amount initial of variance found among the variables and to the exploratory nature of the work.

The results presented in Table 13 represent the rotated component matrix. This is the matrix of the factor loadings for each variable onto each factor. The output within this table contains the same information as the component matrix shown in Table 13 with the exception it was calculated after rotation. Many similar considerations prior to rotation were taken. Factor loadings less than 0.4 have not been displayed because it was requested these loadings be suppressed. Further, the variables are listed in the order of size of their factor loadings.

Table 13

Rotated Component Matrix

Variable	Component		
	1	2	3
Race/Ethnicity	.777		
Age	.402	.755	
Payer Type	.480	-.656	
Discharge Status			.882
Sex			.419

After completing rotation common themes were identified. Variables loading highly on Factor 1, Age and ED Visit included Race (r = .80), which revealed a strong, positive relationship. This was followed by Age (r = .681) which showed a moderately, positive relationship. Factor 2, Sex, revealed three variables which loaded after rotation to include its highest and strongest loading, Payer (r = .825), followed by Age (r = .425), with Sex displaying a moderately negative relationship (r = -.415). The final component, Factor 3, Discharge was positively correlated with ED Visit and revealed a very strong, positive relationship (r = .89) after rotation. This was followed by a moderately strong relationship shown for Sex (r = .448). This exploratory analysis revealed after rotation the following factors: Race and Payer having the strongest relationship with ED Visit.

Rotating the remaining factors revealed a very strong, positive correlation among Race (r =.80) and Payer (r = .82). These two factors serve as the best predictors of a visit to the ED within this sample. Further, results from this analysis show most visitors to the ED are likely to be White (55.6%) and receive AHCCCS [Medicaid], (32.2%). Additionally, Discharge displayed a strong, positive relationship with an ED visit, (r = .89). Findings discovered during the initial analysis revealed a significant portion of the sample were sent home (94.3%). Discharge, although not a variable of primary interest, did contribute to a significant amount of the initial total variance among the variables.

Summary

In this chapter, I provided an overview of the data collection methods. Analyses of the study were presented through descriptive statistics, Factor Analysis, and Pearson's

(r) Correlation Coefficient. All data were analyzed with SPSS version 21.0 software. Findings from the analysis were organized into three sections. Demographics of the study were presented first. This was followed by a presentation of each research question with the 2013 data analysis and discussion.

A key variable to the study, mental disorder was not strongly represented with the study sample (0.0276%). Relevant mental disorders revealed during the exploratory analysis included the following: anxiety disorders (n = 17), substance abuse disorders (n = 18), mood disorders (n = 7), and impulsive control disorders (n = 2). The case total for mental disorders was 44. Such a small sample presented a challenge for Research Question #1 and the overall study. In order to appropriately explore mental disorders within the sample with Factor Analysis, the variable must have a high loading (≥ 1) and therefore contribute significantly to the initial total variance among the variables. As presented earlier within the analysis, two criteria were used to determine the number of factors to rotate: the scree test and the interpretability of the factor solution. The scree plot (Figure 1), displayed the eigenvalues with loadings ≥ 0.70 thus revealed the relative importance of each factor. The scree test displayed two factors with quite high loadings (>1), Age and Sex. A single factor with an eigenvalue of 1, Discharge was retained and included for factor rotation. Mental Disorder did not load due to its small presence within the study. A lack of strong presentation for the variable Mental Disorder excluded it from being pursued further and served as the primary reason Research Question 1 received no further exploration.

Rotated findings associated with Research Question 2, revealed strong relationships among the factors Race and Payer. The best predictors of an ED visit within this sample were predisposing and need factors. Demographic analysis results revealed visitors to Arizona EDs were predominantly White and recipients of AHCCCS, a form of Medicaid. Discharge also contributed invaluable information to this exploratory analysis. Findings revealed most patients (94.3%) were released with orders for self-care and not admitted from the ED to the hospital.

In Chapter 5, I discuss major findings in more detail. Findings discovered during this exploratory analysis are positioned to extend existing knowledge surrounding mental illness and healthcare utilization within Arizona. Results will be evaluated within the context of Andersen's BM and any similarities found from earlier literature findings examined in chapter two.

Limitations associated with this study will also be discussed. Recommendations for future research study efforts will be conducted as an outcome of these findings. Lastly, the potential impact for social change as a result of pursuing a psychiatric epidemiology study will be presented.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

An increasing number of psychiatric patients with unmet needs find themselves passing through the doors of an ED each year (AHRQ, 2010). The growing presence of mental disorders has been widely referenced in the literature as a component of emergency services (Bourdeaux, Clark, & Camargo, 2008; Larkin et al., 2005). Annually, one in three adults in the non-institutionalized population has a diagnosable mental or addictive disorder (Kessler et al., 1994; Reiger et al., 1993) and this prevalence increases to 40% among ED patients (Larkin et al., 2009). Research data suggests that mental health patients now make up the fastest group of persons seen within the ED setting (Larkin et al., 2009). The increased utilization of emergency services by this group has prompted questions regarding frequency, underlying factors, and best predictors of an ED visit in the State of Arizona.

This study was a quantitative secondary analysis of AZDHS-DBS, FY2013 ED discharge data. The purpose of this study was to determine which factors (if any) are the best predictors of an ED visit and to identify the underlying dimensions by which Arizonans with a mental illness present to the ED. The discovery of components related to ED visits in Arizona are important for the development of effective interactions among provider and patient, the allocation of available resources, and improved lives of individuals with SMI.

The demographics within the sample differed and possessed numerous characteristics. Women represented the largest gender group (54%), followed closely by men (45%). A substantial percentage of the study sample visited the ED for either an emergent or urgent reason (94.3%). Younger people, those under the age of 50 visited the ED more often than those over 50 years of age (69% vs. 31%).

Substantial findings were revealed for both research questions. An integral part of the study surrounded the first research question. Specifically, which factors (enabling, predisposing, and need) were most associated with an SMI individual visiting an Arizona ED. Upon analysis of the scree plot five factors (AGE, SEX, DISCHARGE, PAYER, and RACE) were retained for rotation. Of these five factors only two loaded highly (>1), AGE and SEX. MENTAL DISORDER, a key study variable, was not among the five retained factors, nor did it load highly. A thorough analysis revealed this key component represented a very small number of ED discharges within the sample (n = 44, 0.027%). Although a powerful tool, SPSS by default will not calculate factor loadings of this size regardless of a large sample (>250). Any analysis of mental disorder by factor analysis or correlation was discontinued due to lack of generalizability.

A second intent of the study was to identify a combination of factors that best predicted an ED visit. This was accomplished by interpreting the shared variance among the underlying extracted factors after rotation. Completing factor rotation revealed RACE and PAYER were the strongest and best predictors of an ED visit within the sample. Additional discoveries during this exploratory analysis served as further support of the

rotated findings. Specifically, visitors to an ED were likely to be White, aged 50 or less, a recipient of AHCCCS [Medicaid], and discharged home.

According to Andersen's Behavioral Model [BM], (1995), the use of health services consists of three major components that predispose, enable, or suggest a need for individual use of health services. Related study findings discussed within Chapter 2 (Lunsky et al., 2012; Crane et al., 2012; Knowlton et al., 2013; Acosta & Lima, 2015) confirmed these components of the BM and ED utilization among their findings. Results from this study consisted of similar findings which showed demographic characteristics of age and sex (predisposing), available personal resources (enabling), and an emergent or urgent perception for care (need) were all meaningful within Research Question #2 and confirms predictions made within the BM.

The findings of Research Question #2 also confirmed previous study findings (Babitsch et al., 2012) showing differences in healthcare use based on social characteristics. Specifically, women were identified as using outpatient services more than men (Babitsch et al., 2012). Upon close analysis of the demographic characteristics within the sample, women frequented the ED more than their male counterparts (54% vs. 45%, respectively). The identification of a disproportion in healthcare utilization among genders could signal unmet medical needs (La Calle & Rabin, 2010; Owens et al., 2010; Pines et al., 2011; Scott et al., 2014; Vandyk et al., 2013). Such information may be beneficial for resource allocation for healthcare facilities and other community-based services. Strong evidence within the literature supports resource use as a positive impact

upon life quality and substantially affects overall population health (Healthy People 2020, 2015; WHO, 2013; Allen et al., 2014).

Explanation and Interpretation of Findings

Agreement of Findings with the Literature

Discoveries revealed during analysis did coincide with relevant findings among most of the preceding cited studies. As an example, (Acosta & Lima, 2015; Crane et al., 2012; Lunsky et al., 2012; Knowlton et al., 2013) all recognized the importance for accurately identifying the most significant predictors of ED use among individuals with a mental illness. Findings from these studies also highlighted the key components of the BM and indicated the need for more primary studies to strengthen our understanding of healthcare utilization and the complexity of the methods shown in the BM among the SMI population.

This study revealed males were not as strongly represented within the sample as females and identified smaller ethnic groups of ED visitors. A continued agreement with prior, identified literature includes research study efforts aimed at developing a definition for subgroups with unmet needs such as young, unemployed males who could benefit from tailored, effective care options upon being discharged from the ED (e.g., community-based services) (Doupe et al., 2012; Martin et al., 2013; Vandyk et al., 2013). Additionally, findings from this study were comparable to recently published studies that demonstrated ED visitors are not a homogenous group and require increased attention to

their differences (Castillo et al., 2014; Doupe et al., 2012; La Calle & Rabin, 2010; Martin et al., 2013; Vandyk et al., 2013).

Inconsistencies found upon close analysis also revealed similar findings with the preceding literature. It remains unknown to what extent frequent visitors impact ED resources (Pines et al., 2011; Scott et al., 2014). Further, utilization patterns by payer, region, and patient and hospital characteristics persist as poorly understood areas related to ED visits (Brennan et al, 2014; Owens et al., 2010; Morgan et al., 2013; Sandoval et al., 2010).

New Discoveries

To date there have been no studies examining healthcare utilization (i.e., ED use) among mentally ill persons in Arizona. The current study did not demonstrate which of the three components or combination of the BM were most associated with an SMI individual visiting an Arizona ED. Further, the BM indicates multiple factors on health services use representing enabling, predisposing, and need factors. For an ED visit, a strong, positive relationship was found among RACE and PAYER. A close examination of demographics suggests possible unmet needs among males. Additionally, primary studies are needed to fully assess ED use among Arizona's SMI population.

<div align="center">

Limitations

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This study was a secondary data analysis of AZDHS-DBS, FY2013 ED discharge data. The research questions presented within the study, although tailored to be used within the BM, were not developed for the chosen dataset. A research-question driven

approach was taken which accounted for the existing data being reviewed after the development of questions and hypotheses. Having no control of the data contributed to the lack of generalizability later discovered within Research Question 1.

This study was a first of its kind and an exploratory analysis with specific limitations attached to it. First, the literature review initially encompassed a search of both primary and secondary sources related to the frequent ED use among mentally ill persons within the State of Arizona. Several key terms were utilized during the search for relevant literature resulting in no findings over the course of several months. Pioneering understudied or no studies to-date are limitations presently associated within psychiatric epidemiology. Secondly, exploratory research is not definitive nor is it authoritative. This form of research is an exploration of the research questions and offers no solutions to existing problems. No conclusive evidence resulted from this study.

The results of this study cannot be generalized to the larger United States population because mental disorder, a key variable under analysis, was poorly represented within the sample. The work conducted did not change the dataset in any way that would make it less trustworthy or valid.

Recommendations

To date, no researchers have examined the use of the BM in predicting the factors associated with an ED visit among mentally ill persons in the state of Arizona. As evidenced by the review of the literature in Chapter 2, many of the studies reached the same conclusion regarding the importance of increased primary studies examining

healthcare utilization within the mentally ill population group (Lunsky et al., 2012; Crane et al., 2012; Knowlton et al., 2013; Acosta & Lima, 2015). Based on the literature reviewed and the outcome of the study, I have identified two meaningful recommendations regarding ED use among SMI individuals.

First, due to substantial budgets cuts to mental health programs and other community-based services by the State of Arizona, SMI individuals are now faced with fewer services. This research will be necessary for informing those in practice and within administration of the unique and complex nature of needs within the SMI population. Additionally, the main findings from this study will be presented to those in emergency psychiatric practice during the Southern Arizona National Mental Health Alliance (SA-NAMI) Walks, in Tucson, Arizona, April 2017.

Second, it is recommended that research within psychiatric epidemiology continue. This lesser known, subfield of epidemiology is young and has only recently began to fill the stark gaps in the research literature. The research presented here was restricted by the use of secondary data not collected with the presented questions in mind. However, studies with questions generated to represent the three main components of the BM to examine healthcare utilization within the SMI population may add substantial findings to the growing body of literature.

Implications

Social Change

Inequalities come in many forms. Findings from this study can exert a meaningful positive effect on social change within the community and at the administrative level. Guided by the Behavioral Model (BM), this study revealed differences among women and men when visiting the ED and the most significant factors that enabled an individual to pay for health services. Medical professionals concerned with healthcare utilization at the individual level could use information from this study to address key health determinants (e.g., social and economic). Components of the BM such as enabling factors serve as a condition of individual health service use. Areas within this component include the individual's ability to pay and travel and waiting times for services. This information could be used to better inform administrators of their organizational structure and distribution of services, provider and hospital density, provider talent diversity, management oversight of quality, and outreach and educational programs. Educating providers and others within the medical profession on the predisposing, enabling, and need factors related to an emergent or urgent visit to an Arizona ED are dimensions of justice which promote well-being in a society.

While, based on the limited sample size related to mental health precluded further analysis of the effect of the rising rates of mental health issues among the population and among ED users, the suggestion based on this research that White women on Medicaid are more likely to use the ED in Arizona may provide some clue as to the motivations for

that use. Previous research has suggested that there is little difference in ED use among patients on Medicaid based on gender and Blacks are typically more likely to access ED than Whites (Doran, Colucci, Wall, Williams, Hessler, Goldfrank, & Raven, 2015a; La Calle, Rabin, & Genes, 2013; Martin, Stokes-Buzzelli, Peltzer-Jones, & Schultz, 2013; Merrick, Perloff, & Thompkins, 2010; Scott et al., 2014; Small, 2011; Vinton, Capp, Rooks, Abbott, & Ginde, 2014). Mental health, while its contribution was not measurable in this study, may confound those relationships. A more in-depth understanding of motivating factors for ED use will provide opportunities for policy change and educational activities to reduce the dependence on the ED for non-urgent care. This would have a significantly positive impact on healthcare costs and issues associated with social justice.

The low rate of documented mental health rates among the ED population of Arizona, as compared to the rates reported in the literature could lead to policy or practice changes in relation to the diagnosis and documentation of mental health issues among ED patrons. This could lead to improvements in the care of the disadvantaged population suffering from mental health disorders who are currently undiagnosed and therefore untreated. With the advancements in the care of those with mental health issues, decreasing the rates of the undiagnosed and untreated would lead to positive social change.

Health emergencies regardless of their scale influence the community and the disadvantaged. Findings from the study have presented opportunities for prevention,

informing and educating both provider and patient, mobilization of community partnerships, and for those within the medical professions, we must become closer to the people and the challenges which pose a threat to well-being and increase inequality.

Empirical Implications

A careful examination of study findings suggest that social and economic factors are good predictors for healthcare use. Frequency of visits to the ED among women and men revealed differences. Within this sample, women were more likely to visit an ED than men. In addition, a substantial percent of ED visitors where White, under the age of 50, Medicaid recipients, and were not admitted to the hospital. With continued research efforts to include this study, findings would be beneficial for health facilities to take more proactive steps in predicting use and meeting the complex health needs of their community.

There are other factors to acknowledge. Demographic differences identified during analysis are noted throughout the previously reviewed literature as impacting healthcare use. It is recommended future research efforts are also based on patients' social characteristics while continuing to expand the existing body of literature on patterns of use in different healthcare settings.

Conclusions

Since 2011 the National Health Interview Survey (NHIS) has collected detailed information on reasons for ED use (Gindi, Black, & Cohen, 2016). Among their findings, few changes in ED visits were noted between 2013 and 2014 (Gindi et al., 2016). To

date, differences in ED use remain unchanged (Gindi et al., 2016). Since beginning this study in 2014, there have been a number of documented instances of increased ED visits due to opioid misuse, continued loss of health coverage, and serious mental illness (SMI), (Healthcare Cost and Utilization Project [HCUP], 2016). Arizona is one among many states seeing such increases (HCUP, 2016). Further, data within the National Health Statistics Reports (2016) highlighted specific reasons associated with an ED visit which included insurance type and socio-demographics (Gindi et al., 2016). Due to research findings from this study and those presented here all mentioning insurance type and socio-demographic factors greatly influencing an ED visit, this information could guide future analyses of ED data.

The BM informs research that individual factors, those that predispose, enable, or suggest a need promote healthcare utilization. Findings from this secondary analysis of data revealed most within the sample were white females, aged 50 or less, and received Medicaid. Differences existed among women and men when visiting the ED. Women within this sample frequented the ED more than their male counterparts. Understanding what factors influence an ED visit can guide future research, aid in informing clinical leadership, generate the fair allocation of resources, and empower a committed effort to well-being for all members of the community.

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Zwick, W.R. & Velicer, W.F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99(3): 432-442.

Appendix A

<div align="center">

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Charlalynn Harris** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 09/15/2012.

Certification Number: 997905.

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<div align="center">

Arizona Hospital Discharge Data
Public Use File
Release Request and Data Use Agreement

</div>

MAIL YOUR APPLICATION TO:

Arizona Department of Health Services

Arizona Department of Health Services Bureau of Public Health Statistics

Section of Cost Reporting and Discharge Data Review

150 North 18th Ave - Suite 550
Phoenix AZ. 85007-3248

i,.1. Available data is Hospital Inpatient (IP) ar Hospital Emergency Department (ED) dischargerecords.

.,. **2.** Data is provided in 6 month sets, January - June ("01") and July - December ("02") based upon discharge date.

.,. **3.** Available data is 2008 forward; target release dates for new data are May ("02") and November ("01") each year.

i,. **4** , There is no charge for release of Public Use Files (PUFs).

LL **INFORMATION BELOW IS REQUIRED, INCLUDING SIGNATURE AT BOTTOM OF PAGE 2.**

Requestor information and mailing address:

Requestor Name:Prof. Charlalynn Harris Organization Name (if applicable):Walden

University Address: 3204 Wanstead Park Dr. #702   City: Suwanee State: GA Zip: 30024

Organization Website (if applicable): www.waklenu.edu

Contact Person: Char Harris   E-Mail: char1alynn.harris@waldenu.edu   Ph one: 470-326-5548

Data Set Time Periods(s) (for example, 2015-01)	IP	ED	FORMAT ASCII, DBF or SAS
ED Hospital Discharge Data FY 2013 Jan-Jun		✓	DBF & SAS
ED Hospital Discharge Data FY 2013 Jul-Dec		✓	DBF & SAS

Data is sent on CD **via USPS first class** mall.

Please describe your proposed use of the data with at least one descriptive example: I have attached an excerpt from my dissertation below for your review.

The purpose of the study is to determine the factors and underlying dimensions by which Arizonans with a mental illness present to the ED. In this research, I plan to identify the statistically significant factors that explain the variation and covariation among the predictors (enabling, predisposing, and need). This will add to the current understanding of the magnitude and severity of ED use by mentally ill persons (Green & Salkind, 2003). Determining the magnitude and severity among identified factors and ED use is a necessary first step for informing those in practice and administration. For this study, independent variables were enabling, predisposing, and need factors. The dependent variable is emergency department (ED) visits.

Arizona Hospital Discharge Data
Public Use File
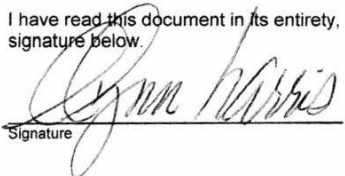**Release Request and Data Use Agreement**

Data Use Restrictions and Agreement:

The Requestor hereby provides the following assurances regarding the use and protection of Arizona Hospital Discharge Data:

1) I will safeguard the data from unauthorized access;

2) I will not release any patient-level data or individual patient records or any part of them to any person.

3) I will not attempt to identify individuals;

4) I will not attempt to link the individual records of patients in this data with any other individual level data or individual level information from any other source;

5) I will not release or disclose analysis results or any other information where the number of observations in any given cell of tabulated data is less than or equal to 10;

6) I will not copy, sell, rent, license, lease, loan, or otherwise grant any access of any kind to the data covered by this Agreement to any other person or entity, and I understand that this Agreement cannot be sold, assigned or transferred;

7) I will not use the data for any purpose other than the purpose(s) herein described;

8) I understand that I am personally responsible for appropriate use and protection of the data to which I have been granted access, and that violation of the terms of this Agreement will result in denial of access to Arizona Hospital Discharge Data and may make me subject, as an individual violator, to prosecution under HIPAA;

9) I will indemnify, defend and hold harmless the Arizona Department of Health Services, its employees and contract vendors from any and all claims or losses accruing to any person as a result of violation of this agreement;

10) I will notify ADHS in writing within forty-eight (48) hours of learning of any violation of this Agreement;

11) I will make no statement indicating or suggesting that interpretations drawn from the data are those of the Arizona Department of Health Services;

12) If cited in a publication or presentation, the source of the data shall be acknowledged as the Arizona Hospital Discharge Limited Data Set, Bureau of Public Health Statistics, Arizona Department of Health Services.

Data Requestor Attestation:

I have read this document in its entirety, I understand the content of this document, and I have indicated such by affixing my signature below.

Lynn Norris ___April 12, 2016___
Signature Date